DECUS LIBRARY

EUROPEAN DECUS PRICE SCALE

	Austria/AS	Belgium/BF	Denmark/DK	England/£	France/FF	Finland/FM
$ 1	25.80	49.70	7.50	-.8.-	5.60	4.20
$ 5	129.50	248.50	37.50	2.-.-	28.00	21.00
$ 10	259.00	497.00	75.00	4.-.-	56.00	42.00
$ 15	388.50	745.50	112.50	6.-.-	84.00	63.00
$ 20	518.00	994.00	150.00	8.-.-	112.00	84.00

	Germany/DM	Italy/Lire	Holland/DG	Norway/NK	Sweden/SK	Switzerland/SF
$ 1	3.70	630	3.70	7.20	5.20	4.30
$ 5	18.50	3150	18.50	36.00	26.00	21.50
$ 10	37.00	6300	37.00	72.00	52.00	43.00
$ 15	55.50	9450	55.50	108.00	78.00	64.50
$ 20	74.00	12600	74.00	144.00	104.00	86.00

DELEGATE MEMBER

A. Programs

1.	Paper Tapes	
	Binary (object)	no charge
	Source	no charge
2.	Listings	
	When not included as part of the write-up	$ 5.00
3.	Card Decks	$ 10.00
4.	DECtape and LINCtape	
	Tape and Program Supplied by DECUS	$ 15.00
	Tape Supplied by User	no charge
5.	Documentation (Write-ups)	no charge
6.	Library Catalog	no charge

B. Meeting Proceedings — no charge

INDIVIDUAL MEMBER

A. Programs

1.	Paper Tapes	
	Binary (object) *	$ 1.00 per program
	Source *	$ 5.00 per program
2.	Listings	
	When not included as part of the write-up	$ 5.00
3.	Card Decks	$ 10.00
4.	DECtape and LINCtape	
	Tape and Program Supplied by DECUS	$ 20.00
	Tape Supplied by User *	$ 5.00
5.	Documentation (Write-ups)	no charge
6.	Library Catalog	no charge

B. Meeting Proceedings (If not an Attendee of the Meeting) — $ 5.00

DECUS
EUROPE

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
81, ROUTE DE L'AIRE 1227 CAROUGE/GENEVA SWITZERLAND TÉL. (022) 42 79 50 TELEX 22 883

Geneva, April 22, 1970

Dear DECUS Member :

Since the DECUS program library service is handled in Maynard, all European DECUS members should continue sending their program request forms to DECUS Maynard.

According to a decision made by the DECUS Executive Board in December 1968, some charges are made to help defray the cost of handling and postage. Payments for library material should be made on a "cash in advance" basis. However, European DECUS members who find it too difficult to make advance payment in U.S. dollars to DECUS Maynard, now can make payment in their local currency to DECUS Europe. Checks or money orders should be made payable to :

DECUS
c/o Crédit Suisse
Agence Praille-Acacias
Geneva, Switzerland

Account number : 321295.

If you decide to pay to DECUS Europe, please indicate on your program request form : "Payment has been made to DECUS Europe".

For your guidance I attach herewith a price scale, giving the conversion rates from U.S. dollars to European currencies. Please use this price scale when making payment to DECUS Europe.

You will also find attached an explanation of charges in U.S. dollars for DECUS program library material for both individual and delegate members.

Please feel free to contact me, should you have any questions regarding payment for your program library material.

Very truly yours,

Martha Ries

Martha Ries
European DECUS Secretary

encls.

DECUS

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS 01754/TEL. 897-5111/TWX 710 347-0212

NOTICE

At a recent meeting of the DECUS Finance Committee, the policy on payment of DECUS programs and other materials was revised. The policy now reads:

> Payment for DECUS material should accompany the request whenever possible. Requests on company purchase orders will be accepted and invoiced upon delivery. For payment in advance orders a 10% discount will be allowed.

May 1970

DECUS
DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS 01754 / TEL. (617) 897-5111 / TWX 710 347-0212 TELEX: 94-8457

December 1976

Dear DECUS Member:

DECUS Library activity and member requests for new Library services have increased substantially. Unfortunately, the cost of media, reproduction services, printing, and mailing have grown even more rapidly. The large variety of DECUS software and increasing complexity of various Digital operating systems have made Library operation more difficult and more expensive. During the twelve month period from July 1975 to June 1976, Library expenses exceeded Library income by 59 percent.

After an analysis of Library operation expenses during the above period, an increase in Library service pricing was approved by the DECUS International Liaison Committee. This increase was announced in the last DECUSCOPE, Vol. 15, No. 3, to become effective on 1 January 1977.

You will find attached a Program Library Media/Price Chart and a numerical index. The index lists programs by number, title, and media/price code. The media/price code is keyed to the chart; the first letter indicating the media, and the next two digits indicating the price in United States currency at the top of the chart.

Canadian members may make payment in U.S. currency. The Australia and Europe Chapter Offices will provide quotations in the currency of the country from which the order originates. Currency exchange charts are available from those offices. European members may refer to the exchange chart in DECUSCOPE, Vol. 15, No. 3. Members of the Australia Chapter may refer to the latest DECUS Australia News (November 1976) for conversion information. If you have questions, please contact your Chapter office at one of the following locations:

DECUS AUSTRALIA/NEW ZEALAND
P.O. Box 491
Crows Nest, New South Wales, 2065

DECUS CANADA
P.O. Box 11500
Ottawa, Ontario K2H 8K8

DECUS Europe
P.O. Box 340
1211 Geneva 26, Switzerland

DECUS U.S.
146 Main Street
Maynard, Massachusetts 01754

The accompanying index and chart replace the service charge pages and the numerical index in existing catalogs. Please update your catalog accordingly.

The DECUS Library Committee is embarking aggressively on projects to make Library operation more cost effective and to improve the quality of service. This badly needed price increase will make it possible for your Library to continue to serve and meet your needs in the future as it has in the past.

H. David Todd

H. David Todd
DECUS Program Library Coordinator

Chuck Conley

Charles H. Conley
DECUS Program Library Director

DECUS LIBRARY
PROGRAM SUBMISSION INFORMATION

Programs should be submitted to:

DECUS Program Librarian
Digital Equipment Computer Users Society
146 Main Street
Maynard, Massachusetts U.S.A. 01754

or

DECUS Executive Secretary
81 Route de L'Aire
1227 Carouge/Geneva
Switzerland

The following material MUST be included:

(1) Completed submittal form

Read the following notes which explain the form.

Section A

(1)	Object Computer(s) - computer(s) on which the program runs. Source Computer - computer on which program was assembled (if different).
(2)	File Name - mnemonic or acronym of 6 characters (8 for PDP-12) for mass storage purposes. Version No. - indicate version or development level. If unspecified DECUS will assume version No. 1.
(3-7)	Self-explanatory.
(8)	Category Codes - reference the list of codes distributed with the DECUS Library Catalog. (Additional copies of code listings are available from the DECUS office.)
(9)	Monitor - if the program runs under a monitor, all relevant details must be specified.
(10-14)	Self-explanatory
(15)	Please indicate if major revision or development is planned, with estimate of completion date.

Section B

The submission of an assembly (Pass 3) listing is optional but desirable; short listings may be incorporated into the write-up. Other acceptable material includes flow-charts, cross referenced listings, core maps or any other relevant documentation. The abstract must be written in English but full documentation may be in any language.

Section C

The authorization at the bottom of the submission form must be signed by the person having legal right and interest in the submitted program.

(2) Abstract

An abstract (in English) of up to 100 words must be attached. This will be used in the preparation of the DECUS Library Catalog entry.

(3) Write-up

It is requested that documents be suitable for direct reproduction. Clear operating and loading instructions must be part of any document submitted. Where applicable a printed copy of the tape file index, including a brief description of each file function, would be helpful.

(4) Paper Tape

All material should be fully labelled with program name, version, starting address (where applicable) and tape format (ASCII, binary, etc.). Source tapes should be submitted whenever possible.

and/or

(5) DECtape/LINCtape/Magtape

Attach to each tape a printed index of tape file contents. Specify mark track format used. Source files should be submitted whenever possible.

PROGRAM REVISIONS

Revisions to existing DECUS or DEC programs should be accompanied by a program revision submission form (attached).

DECUS LIBRARY
NEW PROGRAM SUBMISSION

Form to be used when submitting new programs to DECUS.

A. GENERAL INFORMATION

1. Object Computer(s) _____ Source Computer (if different) _____
2. File Name _____ Version No. _____
3. Title _____
4. Author _____
5. Submitter (if other than author) _____
6. Affiliation _____
7. Address _____

   _____ Country _____
8. Category Code(s) (please list in order of importance) _____
9. Monitor/Operating System* _____ DEC No.* _____
10. Core Storage Required _____ Starting Address* _____
11. Peripherals Required _____
12. Other Software Required _____ DEC or DECUS No.* _____
13. Source Language _____
14. Restrictions, Deficiencies, Problems _____

    _____
15. Date of Planned or Possible Future Revisions _____

B. MATERIAL SUBMITTED

Documentation

Abstract (In English) ☐ Write-up ☐ Listing ☐ Documentation Language (if other than English) _____

Other Material (please specify) _____

Paper Tape

Object Binary ☐ Object ASCII ☐ Source ☐ Other _____

DECtape ☐ LINCtape ☐ Mark Track Format _____ Magtape: 7 Track ☐ 9 Track ☐ BPI _____

Specify Format/System (e.g. OS/8, LAP4, DIAL, DOS-11, DOS-15, etc.) _____

Object Files ☐ Source Files ☐ Documentation Files ☐ Other _____

C. AUTHORIZATION

I, the undersigned, give full permission to DECUS to publish information regarding this program and to reproduce and distribute this program in full or in part to all interested parties, in accordance with the then standard policies of DECUS for reproduction and distribution of programs submitted to DECUS. I further warrant and represent that I have good and sufficient title and all rights and interest in and to the program to grant such permission to DECUS.

Date _____ Signed _____

*Where applicable

DECUS LIBRARY
PROGRAM REVISION SUBMISSION

Form to be used for modifications or revisions to existing DEC or DECUS software.

A. GENERAL INFORMATION

1. Object Computer(s) _____ Source Computer (if different) _____
2. Original File Name and Title _____

   _____ DECUS or DEC No. _____
3. Original Author _____
4. Revising Author _____
5. Affiliation _____
6. Address _____

   _____ Country _____

B. CHANGE INFORMATION

Please specify any changes to the following:

1. Category Code(s) (please list in order of importance) _____
2. Monitor/Operating System* _____ DEC No.* _____
3. Core Storage Required _____ Starting Address* _____
4. Peripherals Required _____
5. Other Software Required _____ DEC or DECUS No.* _____
6. Restrictions, Deficiencies, Problems _____

C. REASON(s) FOR REVISION

1. Debug, correct known problem ☐
2. Extend to handle new or different configurations ☐
3. Operate under different monitor or new system ☐
4. Increased operational efficiency ☐
5. Operate on different processor ☐ Specify _____
6. Other (please specify) _____

D. MATERIAL SUBMITTED

Documentation

All revisions should include a detailed statement of the changes made to the existing program.

Revised Abstract ☐ Revised Write-up ☐ New Listing ☐

Paper Tape

Object Binary ☐ Binary Patch ☐ Object ASCII ☐ Source ☐ Other _____

DECtape ☐ LINCtape ☐ Mark Track Format _____ Magtape: 7 Track ☐ 9 Track ☐ BPI _____

Specify Format/System (e.g. OS/8, LAP4, DIAL, DOS-11, DOS-15, etc.) _____

Object Files ☐ Source Files ☐ Documentation Files ☐ Other _____

E. AUTHORIZATION

I, the undersigned, give full permission to DECUS to publish information regarding this revision and to reproduce and distribute this revision in full or in part to all interested parties, in accordance with the then standard policies of DECUS for reproduction and distribution of programs submitted to DECUS. I further warrant and represent that I have good and sufficient title and all rights and interest in and to the revision to grant such permission to DECUS.

Date _____ Signed _____

*Where Applicable

DECUS PROGRAM LIBRARY CATEGORY CODES*

00. Utility (External) Programs

- 0 Unclassified
- 1 Multiple Utility
- 2 Flowcharting
- 3 Magnetic Tape Handling
- 4 Paper Tape Handling
- 5 Disk Handling
- 6 Drum and Direct Data Devices
- 7 Graphic Display Devices
- 8 Remote Data Acquiaition

01. Utility (Internal) Programs

- 0 Unclassified
- 1 Loading
- 2 Clear/Reset Memory
- 3 Check Sum Accumulative and Correction
- 4 Internal Housekeeping
- 5 Dump to Reload/Restore Operations
- 6 File Organization
- 7 Self Checking Digit
- 8 Packed Data Handlers
- 9 Duplicators/Verifiers

02. Diagnostics

- 0 Unclassified
- 1 Status Recorders
- 2 Hardware Maintenance

03. Programming Systems

- 0 Unclassified
- 1 Assemblers
- 2 Compilers
- 3 Interpretive Systems
- 4 Input/Output Control
- 5 Report Generators
- 6 Preprocessing and Editing
- 7 Macros and Macro Generators
- 8 Functions and Subroutines
- 9 Desk Calculators

04. Testing and Debugging

- 0 Unclassified
- 1 Dumping
- 2 Tracing
- 3 Test Data Preparation
- 4 Testing Systems
- 5 Break Point Printing
- 6 Memory Verification and Searching
- 7 On-Line (DDT Type) Debuggers

05. Executive Routines

- 0 Unclassified
- 1 Monitor
- 2 Supervisors
- 3 Disassembly and Derelativizing
- 4 Relativizing
- 5 Relocation

06. Data Handling

- 0 Unclassified
- 1 Sorts
- 2 Merges
- 3 Data Transmission
- 4 Table Operation
- 5 Conversion and/or Scaling
- 6 Character and Symbol Manipulation
- 7 Information Classification, Storage, and Retrieval
- 8 List Processing
- 9 Typesetting

07. Input/Output

- 0 Unclassified
- 1 Binary
- 2 Octal
- 3 Decimal
- 4 BCD
- 5 Hexadecimal
- 6 Composite
- 7 ASCII
- 8 Plotting
- 9 Display

10. Systems Analysis

- 0 Unclassified
- 1 Network Design
- 2 File and Core Requirement
- 3 System Design
- 4 Configuration

11. Simulation of Computers and Components

- 0 Unclassified
- 1 Computers
- 2 Peripheral Equipment
- 3 System Component or Feature
- 4 Pseudo-Computer

12. Conversion of Programs and Data

- 0 Unclassified
- 1 Data Conversion
- 2 Computer Language Translators

*These category (classification) codes have been adopted directly from those established by JUG (Joint User Group)

DEC 7-(369)-1147-N972

September 1972

13. Statistical

0 Unclassified
1 Descriptive
2 Univariant and Multivariant Parametric
3 Non-Parametric
4 Time Series and Auto Correlation
5 Probability Distribution Sampling and Random Number Generators
6 Correlation and Regression Analysis
7 Analysis of Variance and Covariance
8 Sequential Analysis
9 Discriminant Analysis

15. Management Science/Operations Research

0 Unclassified
1 Simulations
2 Linear Programming
3 Non-Linear Programming
4 Scheduling/Critical Path/PERT/LESS
5 Games, Game-like Models and Game Theory
6 General Problem Solvers
7 Inventory Control

16. Engineering

0 Unclassified
1 Aeronautical
2 Civil
3 Chemical
4 Electrical
5 Mechanical and Hydraulic
6 Petroleum
7 Nuclear
8 General
9 Simulation

17. Sciences and Mathematics

0 Unclassified
1 General
2 Nuclear Physics
3 Chemistry
4 Geology, Oceanography, Oceanology and Geophysics
5 Biology
6 Social and Behavior
7 Astronomy and Celestial Navigation
8 Simulation
9 Pure Mathematics

18. Nuclear Codes

0 Unclassified

19. Financial

0 Unclassified
1 Inverting and Borrowing
2 Capital Stock
3 Taxes
4 Cash Custody and Forecasting
5 General Accounting
6 Auditing
7 Banking Operations

20. Cost Accounting

0 Unclassified
1 Material Only
2 Labor Only
3 Work in Progress

21. Payroll and Benefits

0 Unclassified
1 Payroll
2 Employee Benefits
3 Profit Sharing
4 Retirement
5 Insurance
6 Credit Union

22. Personnel

0 Unclassified
1 Recruiting and Hiring
2 Inventorying Employees
3 Training
4 Performance Review
5 Administering Wages and Salaries

23. Manufacturing

0 Unclassified
1 Scheduling/Loading
2 Job Reporting
3 Bill of Materials Processors
4 Numerical Control
5 Control Systems

24. Quality Assurance/Reliability

0 Unclassified
1 Testing
2 Performance Analysis

25. Inventory

0 Unclassified
1 Stocking and Issuing
2 Inventory Analysis
3 Equipment and Tool Inventory and Maintenance

26. Purchasing

0 Unclassified
1 Preparing Purchase Orders
2 Matching Invoices
3 Accounts Payable
4 Purchase Analysis

27. Marketing

0 Unclassified
1 Sales and Billings Forecasting
2 Promotion and Advertising
3 Bid or Request Analysis
4 Distribution or Territory Analysis

28. Sales Entered and Billed

0 Unclassified
1 Order Entry and Scheduling
2 Invoicing
3 Accounts Receivable
4 Sales and Billing Analysis
5 Backlog Reporting

29. General Business Services

0 Unclassified
1 Records Retention
2 Forms Management
3 Transportation
4 Printing and Reproduction

30. Demonstrations and Games

0 Unclassified
1 Display
2 Participation

40. Arithmetic Routines

0 Unclassified
1 Real Numbers
2 Complex Numbers
3 Decimal
4 Floating Point

41. Elementary Functions

0 Unclassified
1 Trigonometric
2 Hyperbolic
3 Exponential and Logarithmic
4 Roots and Powers
5 Geometry
6 Logical and Rounded

42. Polynomials and Special Functions

0 Unclassified
1 Evaluation of Polynomials
2 Roots of Polynomials
3 Evaluation of Special Functions
4 Simultaneous Non-Linear Algebraic Equations
5 Simultaneous Transcendental Equations

43. Operations on Functions and Solutions of Differential Equations

0 Unclassified
1 Numerical Integrations
2 Numerical Solutions of Ordinary Differential Equations
3 Numerical Solutions of Partial Differential Equations
4 Numerical Differentiation

44. Interpolation and Approximations

0 Unclassified
1 Table Look-up and Interpolation
2 Curve Fitting
3 Smoothing

45. Operations on Matrices, Vectors and Simultaneous Linear Equations

0 Unclassified
1 Matrix Operations
2 Eigenvalues and Eigenvectors
3 Determinates
4 Simultaneous Linear Equations
5 Vector Analysis

50. Insurance

0 Unclassified
1 Life
2 Fire
3 Pension and Welfare

61. Education

0 Unclassified
1 Demonstrations
2 Problem Solving
3 Record Keeping

62. Literary Data Processing

0 Unclassified
1 General
2 Language and Literature
3 Linguistics
4 Language Translation
5 Concordances
6 Content Analysis
7 Text Editing
8 Bibliographic Analysis
9 Text Manipulation

63. Humanities

0 Unclassified
1 General
2 Music
3 History
4 Art

71. Hybrid Computing

0 Unclassified
1 Analog/Digital, Digital/Analog Conversion
2 Real Time Computing
3 Simulation

72. Time Sharing

0 Unclassified

99. Miscellaneous

0 Unclassified

DECUS PROGRAM LIBRARY MEDIA/PRICE CHART

	CODES	00 NO CHARGE	01 $2.00	02 $3.00	03 $5.00	04 $6.00	05 $7.00	06 $12.00	07 $14.00	08 $20.00	09 $23.00	10 $24.00	11 $25.00	12 $30.00	13 $35.00	14 $46.00	15 $50.00	16 $60.00	17 $65.00	18 $69.00	19 $70.00	20 $75.00	21 $90.00	22 $100.00	23 $120.00	24 $145.00	25 $150.00	26 $175.00	27 $250.00	28 $305.00	29 $720.00	
A	Write-up		X	X	X	X				X																						A
B	Listing		X				X		X					X	X																	B
D	Write-up & Listing		X	X	X	X				X																						D
E	Manuals									X																						E
F	Binary Paper Tape			X				X		X		X																				F
G	ASCII Paper Tape			X				X		X		X																				G
H	DECtape													1				2					3		4		5					H
J	LINCtape												1				2					3		4								J
K	Floppy Disk									1						2				3												K
L	Cassette									1						2				3												L
M	Magtape 600′																	1														M
N	Magtape 1200′																		1													N
P	Magtape 2400′																			1							1		1			P
Q	RK05 Disk																								1			1		3		Q
R	Card Deck													1						1												R
W	No Listing	X																														W
X	Listing on Media	X																														X
Y	No Write-up	X																														Y
Z	Write-up on Media	X																														Z

X = Price based on length of paper tape or size of write-up.

HOW TO USE THIS PRICE CHART

I. Prices quoted are for programs on DECUS-supplied media. Users wishing to supply their own media must subtract the credit indicated in TABLE A for as many tapes, disks, etc., as required by the program(s) ordered. The numbers 1-5 contained within the price matrix represent the multiple of a single tape or disk or floppy, etc. For example: Price code H16 indicates the program is supplied on two DECtapes at $60.00. From TABLE A, the credit allowed per user-supplied DECtape is $11.00. Therefore, for two user-supplied DECtapes a $22.00 credit is allowed on the $60.00 price.

II. Write-up is included at no charge when program is purchased on any media. When a listing is purchased separately the write-up is included at no charge.

TABLE A: CREDIT FOR USER SUPPLIED MEDIA

DECTAPE (1)	$11.00	MAGTAPE (1) 600′	$14.00
LINCTAPE (1)	8.00	MAGTAPE (1) 1200′	18.00
FLOPPY (1)	7.00	MAGTAPE (1) 2400′	23.00
CASSETTE (1)	7.00	RK05 DISK (1)	95.00

EFFECTIVE: 1 January, 1977

DECUS PROGRAM LIBRARY CATALOG

FOR

PDP-8, FOCAL8

JULY 1973
DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS 01754 TEL. AC 617, 897-5111

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POLICY STATEMENT

THE DECUS PROGRAM LIBRARY IS A CLEARING HOUSE FOR USER PROGRAMS. IT PROVIDES A REPRODUCTION AND DISTRIBUTION SERVICE ONLY. NO PROGRAMMING ASSISTANCE CAN BE GIVEN. IF A PROGRAM DOES NOT WORK AS STATED, THE PROBLEM SHOULD BE DOCUMENTED AND SENT TO DECUS. IT WILL BE FORWARDED TO THE AUTHOR FOR COMMENT. IF PROGRAMS FAIL TO WORK AS STATED BY THE AUTHOR'S DOCUMENTATION THEY WILL BE REMOVED FROM THE LIBRARY.

THE DESCRIPTION, SERVICE CHARGES AND AVAILABILITY OF THE SOFTWARE PRODUCTS DESCRIBED IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE. DISTRIBUTION SHALL BE IN ACCORDANCE WITH THE THEN STANDARD POLICY FOR EACH SUCH SOFTWARE PRODUCT.

EDITOR'S NOTE

Because it is not always possible to include all pertinent information in the brief program abstract, we recommend that users first order only write-ups when there is some doubt as to whether or not a specific program will fit the user's needs.

DECUS Program Library Contacts

Accounting or Pricing Information - Karen King, Karen Barsano or Jean Connors - X2447

PDP-9, PDP-10, PDP-12, PDP-15 orders and information - Cheryl Barber X2524

PDP-8 library orders and information - Mary Hogan X2524

PDP-11, FOCAL8, BASIC8 orders and information - Stacia Taylor X2524

New or proposed library submissions, changes, etc., general library contents - Ferne Halley X2524

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
5/8-20	Remote Operated FORTRAN System
5/8-28a	Phoenix Assembler - PAL III Modifications
5/8-45	PDP-5/8 Remote and Time Shared II System
8-46b	The Utility Programs
8-64a	4K and 8K DECtape Programming System
8-67	PAL Modified for DECtape Input (Uses EAE)
8-77	PDP-8 Dual Process System
8-82	Library System for 580 Magnetic Tape (Preliminary Version)
8-84	One Pass PAL III
8-91	MICRO-8: An On-Line Assembler
8-102a	A LISP Interpreter for the PDP-8
8-122A	SNAP (Simplified Numerical Analysis) Without EAE
8-122B	SNAP (Simplified Numerical Analysis) With EAE
8-123	UNIDEC Assembler
8-124a	PDP-8 Assembler for IBM 360/50 and above
8-125	PDP-8 Relocatable Assembler for IBM 360/50 and above
8-129	Magnetic Tape Program Library System
8-137a	Programs for Storage, Manipulation and Calculation of Data Using DECtape
8-146	High Speed Executive for the PDP-8, PDP-8/I
8-159	CINET-BASIC
8-166	Interim Technical Report, the PDPMAP Assembly System
8-195	POLY BASIC
8-197	Overlay for Standard Editor and PAL III - Assembler
8-200A	BOSS
8-200B	DECtape BOSS for PDP-8 Computers
8-212b	PALH (Modified)
8-213	4K ALGOL
8-216	PAL-D Patch
8-230	Foreground/Background/8 Now
8-242	DATAC I
8-257	UCONN-EAP, Editor-Assembler
8-262	Character Overflow Change to PDP-8 PAL 3
8-271	LIP, LOGICAL "If" Package
8-273	Algonquin Assembler
8-274	Card Reader Patch to Phoenix Assembler
8-305	PAL III Assembler Overlay for Card Reader Input
8-312	DECtape Emulator
8-314	8K FORTRAN Library CR8/I Card Reader Input Routine
8-329a	FOCARL, Version 14
8-330	TSS/8 ALGOL
8-333	8K PAL-D Assembler for 4K Disk Monitor System
8-335	COLPAC
8-336	DECtape Library System Modifications
8-341	LISP-8
8-345	EDIT - PAL
8-354	Pass 3 ASR 33 Format Overlay
8-355	PAL III.75
8-368	Tri-Data CartriFile PAL III Assembler
8-376A	Field 1 Symbol Table Storage for PALD (DEC-D8-ASAA-LA)
8-376B	Field 1 Symbol Table Storage for PALD (DEC-D8-ASAC-LA)
8-377	One Pass Assembler
8-389	Mini-Monitor, A Secondary Disk Monitor for the PDP-8
8-390	PALEDCO (PAL Assembler and Editor Combined)
8-391a	7 or 9-Track MTA for PS-8 with TC-58/TU-20
8-392	Vector-8
8-417	XCORE
8-431	8/I LAB Data System
8-433	Extensions to "LIBRA-FOCAL"
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
8-456A	PIP "AH"
8-456B	BUILD "AH"
8-465	The SKED Software System
8-466A	RL Monitor System (WCFMPG Version) P?S-08-1.1A
8-466B	RL Monitor Subsystems P?S-08-1.1B
8-466F	PAL III Modified for RL Monitor
8-466G	POLY SNOBOL
8-466H	POLY LISP P?S-08-1.1H
8-466I	FOCAL Modified for RL Monitor
8-489	SUBSET, Integer Compiler and Operating System
8-497A	8BAL - PDP-8 Macro Language
8-497B	8BAL Source Documentation
8-499	High-Speed Reader Patch for Lo-Speed Macro-8
8-503	MACRO-8X; 8K Extended MACRO-8 Assembler
8-504A	ESI (Engineering and Scientific Interpreter)
8-504B	ESIX - Extended ESI
8-510	P8COR - Overlay for 8K PAL-D Assembler for 4K Disk Monitor System (DECUS NO. 8-333)
8-515	Program to Mate PAL III With Symbolic Editor
8-526	PROCOL 10/71
8-530	8BALIB - 8BAL Macro Library Generator
8-546	DETEF - DECtape File-Handling System
8-553	Big Brother II
8-569	FLIT Assembler
8-574	TD8E System Handler for 8K PS/8
8-576	LOCAL PAL8: LPAL8.SV
8-583	BASOVR - 8K BASIC Overlay for PDP-8/S
8-587	FORTRAN-D 4K Overlayings to Chain Programs
8-593	Tri-Data Paper Tape PAL III Assembler
8-597	N.I.H. OS/8 Package

July 1974

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
FOCAL8-3	DISK FOCAL
FOCAL8-8	Magtape FOCAL
FOCAL8-11	EAE Routines for FOCAL
FOCAL8-17	FOCAL: How to Write New Subroutines and Use Internal Routines
FOCAL8-32	Translation Table - French
FOCAL8-43	A Collection of FOCAL Patches
FOCAL8-52a	FOCAL 5/69
FOCAL8-53	JMPFOCAL: FOCAL as a LINC-8 Subroutine
FOCAL8-110a	SWAP - FOCAL Disk Data Overlay
FOCAL8-116	KV8FT
FOCAL8-123	LOAD Command for FOCAL-1969
FOCAL8-132	CIG-8 MARK II
FOCAL8-135	MODV - Choice
FOCAL8-136a	FOCAL - Amity
FOCAL8-139	Universal Input/Output for FOCAL
FOCAL8-141	Spanish Language FOCAL
FOCAL8-144	FOCALJ -- DECtape FOCAL-69
FOCAL8-145	FOCAL for Disk and DECtape with Program Chaining
FOCAL8-148	FOCL.S, An Expanded Language for Small Computers, Based on FOCAL
FOCAL8-153	Two Overlays for FOCAL '69, FEXP-X-P and FLOG
FOCAL8-157	Modifications to TSS/8 FOCAL
FOCAL8-164	Four New Functions for FOCAL 5/69
FOCAL8-177	PS/8 FOCAL, 1971
FOCAL8-187	Display FOCAL
FOCAL8-188	Generating Random Numbers with FOCAL
FOCAL8-189	8K Overlay Patch for FOCAL 5/69 (DECUS NO. FOCAL8-52a)
FOCAL8-190	Patch to Add LABEL Feature to FOCAL 5/69 (DECUS NO. FOCAL8-52a)
FOCAL8-211	WEST-KY Four-User FOCAL
FOCAL8-212	Automated Terminal Usage Accounting for Four-User FOCAL
FOCAL8-218	FOCAL Overlay CHAIN
FOCAL8-223	FOCLX, 1972
FOCAL8-227a	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-230	CALCOMP Plotter FNEW PLOTX
FOCAL8-256	OPTION $
FOCAL8-269	4K FOCAL '69 Speed-Up Patches
FOCAL8-271	Modification of FOCL/F for Data Acquisition and Control
FOCAL8-274	FOCAL 5/69 Input Buffer Patch
FOCAL8-281	French Language FOCAL, 5/69
FOCAL8-287	CC-FOCAL-Q
FOCAL8-288	FSPACE - Space Command for FOCAL '69
FOCAL8-294	Real Time FOCAL on the PDP-8 Computer

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
8-52	Tiny Tape Editor
8-66	Editor Modified for DECtape (552 Control)
8-170	FORTRAN Source Conversion Program
8-176	PAL CHOP
8-184	Page Routine
8-185	Modifications to Symbolic Editor and Symbolic Tape Format Generator
8-197	Overlay for Standard Editor and PAL III Assembler
8-209	Editor-With-View
8-239	PAL III/Editor 8K Link Patch
8-247	HELP: A Disk/DECtape Dialogue Program
8-255	SCED: Scope Editor for the AXØ8
8-257	UCONN-EAP, Editor-Assembler
8-266	IBM Editor
8-334	KVEDIT
8-345	EDIT - PAL
8-369	Tri-Data CartriFile DEC Editor
8-381	Cardreader Subroutine for Disk Editor
8-382	Readable High Speed Punch Copier
8-384	BLOK
8-385	Mixed ASCII Formatting and Outputting Technique
8-386	Multiple Field Loader
8-390	PALEDCO (PAL Assembler and Editor Combined)
8-397	8K Editor
8-402	Resequence
8-407	Patch to Editor (DISK) DEC-D8-ESAD-PB
8-408	Disk Utility Program
8-413	GROPE III/A and BINLOC
8-423	Disk Editor With View for LAB-8
8-424	Morse Code
8-427b	MEMO II - Withdrawn
8-449B	LPTQUE - A PTØ8 to A.B. Dick Line Printer Utility Program
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-454	Radio Teletype to ASCII
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
8-466A	RL Monitor System (WCFMPG Version) P?S-08-1.1A
8-466C	Listing Utility Programs P?S-08-1.1C
8-475	PIPQ
8-486	SEGAR 7: A Seven Segment Array for Alphanumeric Character Generation
8-496	UTR7: A 7-track Magnetic Tape Reading Utility
8-497A	8BAL - PDP-8 Macro Language
8-497B	8BAL Source Documentation
8-507	EEPP (Editor Even Parity Punch)
8-515	Program to Mate PAL III With Symbolic Editor
8-518	PS/8 FORTRAN Alphabetical Sort
8-519	MACRO-8 Pass 3 Output Format Patch
8-522	'PAGEIT'
8-541	Cassette Utility Program and PALC

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
8-546	DETEF - DECtape File-Handling System
8-552	Storage Display Device Handler
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display
8-595	UPDATE, A Program to Make Corrections to File Containing Records of Variable Length
8-597	N.I.H. OS/8 Package
FOCAL8-202	Code Generator
FOCAL8-248	FOCTXT - Text Input-Output Patch to FOCAL 1969

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

5/8-2.1a	OPAK - An On-Line Debugging Package
5-4	Octal Typeout of Memory Area with Format Option
5/8-18A	BIN Tape Disassembly Program for PDP-5/8
5/8-18C	Disassembler with Symbols
8-19a	DDT-UP Octal - Symbolic Debugging Program
5/8-33	Tape to Memory Comparator
5-41	Break Point
5/8-55	PALEX - An On-Line Debugging Program for PDP-5 and PDP-8 Computers
8-56a	Fixed Point Trace No. 1
8-57	Fixed Point Trace No. 2
8-78	DIAGNOSE: A Versatile Trace Routine for PDP-8 and EAE
5/8-83A&B	Octal Debugging Program (With or Without Floating Point)
8-89	XOD - Extended Octal Debugging Program
8-91	MICRO-8: An On-Line Assembler
8-95	TRACE for EAE
8-97	GOOF
8-105	D-BUG
8-111	DISKLOOK
8-127	XDDT Extended Octal-Symbolic Debugging Program
8-149	Core Window
8-150	PTOD8 High and PTOD8 Low
8-156	HEPTRACE
8-172	Octal Systems Edit
8-178	Reverse Assembler
8-179	EAE Modifications for Binary Disassembler with Symbols
8-182	Memory Compare
8-233	An Octal Housekeeping and Debugging Package for PDP-8 (PDP-8/I) with EAE and Disk
8-245	Dynamic Octal Disk Debugger
8-253	Disk Dump on Scope
8-259	Symbolic from Pass 3
8-276	Core Editor
8-286	Two Patches for Disassembler with Symbols
8-296	Edit Routine
8-297	TRACE
8-298	OCTMON - An Octal Monitor for the PDP-8 Computer
8-315	Block-Modify
8-349	Octal Debugging Technique with View
8-372	ML Editor (Machine Language Editor)
8-380	WATSNU
8-384	BLOK
8-400a	Execute Slow
8-402	Resequence
8-404	Octal MEM Dump - Extended Memory
8-405	SOOT
8-412	MRS X
8-417	XCORE
8-425	Block-Modify for PS/8
8-436	EAE - Simulator
8-440	PIPL
8-444	COREMAP
8-445	FYLHLP - PS/8 File Utility Program
8-448	CORDMP - Formatted Octal Dump
8-457	DTFIX
8-466E	DECtape Utility Programs P?S-08-1.1E
8-467a	BINREAD (Revised Version)
8-470	ODT-11 (High) Modified
8-479	PDP-8/E Instruction Simulators for other PDP-8s
8-487	Revised Octal Memory Dump
8-490	Tape Alteration Program
8-500	DUMP8
8-508a	TSUTIL - A Utility-Diagnostic Program for TSS-8
8-513	DEBUG 8
8-523	MDT - A Mini Debugging Technique
8-527	XDDT8E
8-531A&B	'TRIPLE' - 36 Bit PDP-8/E Simulator and 'TRIPLE' 8 BAL Macros
8-532	OPDDT (One Page DDT)
8-533	"WHERE"
8-541	Cassette Utility Program and PALC
8-543	TS8REV - Reverse Assembler for TSS/8
8-544	CHECK and CHANGE-D
8-585	FAC HANDLER
8-588	PEEK, A User Program to Look at the TSS/8 Monitor
8-597	N.I.H. OS/8 Package
FOCAL8-2	XOD Modification for use with FOCAL
FOCAL8-268	FX Function for Random Access Files
FOCAL8-293	A Laboratory and Real Time Patch with FNEW FOCAL 5/69

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
5/8-1.1a	BPAK - A Binary Input/Output Package for the PDP-5
8-26A	Compressed Binary Loader
8-26B.1	BN2CBL and CBL2BN BIN to CBL Format Tape Converter
8-26C	Extended Compressed Binary Loader
8-26D	XCBL Punch Program
5/8-27 and 5/8-27a	Bootstrap Loader and Absolute Memory Clear
8-47	ALBIN - A PDP-8 Loader for Relocatable Binary Programs
5/8-48	Modified Binary Loader MK IV
8-81	A BIN or RIM Format Data or Program Tape Generator
8-85	Set Memory Equal to Anything
8-120	DISK/DECtape FAILSAFE
8-130A	REBIL8 - Relocating Binary Loader
8-130B	RELCON - Binary to Relocatable Binary Tape Converter
8-142	Binary Punch - Extended Memory
8-160	FASTLOAD
8-180	Editor and Assembler for 57A Magnetic Tape System (UCRL-50534)
8-181	Automatic Binary Loader and Duplicator-Coder for Auto Bin
8-183	The WANG Loader
8-187	Keyboard Controlled Binary Punch
8-204a	PATCH - A PDP-8 Binary Paper Tape Patch Program
8-205	MTSAFE
8-227	PDP-10/8 - Loader
8-228	A One-Pass Paper Tape Loader for PDP-8 Disk System (OPLOAD)
8-234	SYS/LOAD PUNCH
8-236	System and User Files Read and Punch Program (LEES)
8-241	BUZZTAPE READER/WRITER
8-244	BINSAVE
8-256	Binary to RIM Format Converter
8-268	Miniloader and Miniloader Punch
8-281a	Binary Tape Splicer ASR 33/75A
8-290	Skinny BIN Loader
8-295	COMBIN
8-306	LDR - A One Pass Transparent Loader
8-338	BIN and CBL Loader
8-344	Toledo Extended Memory Binary Punch
8-348	Mini Binary Punch
8-351	ComBIN Loader
8-352	Parity Hi-Lo Loader
8-366	Modified Readable Punch
8-374	Binary to RIM Consolidator
8-382	Readable High Speed Punch Copier
8-386	Multiple Field Loader
8-408	Disk Utility Program
8-409	Card Loader
8-413	GROPE III/A and BINLOC
8-421	Chain Load
8-422	Binary Punch
8-448	CORDMP - Formatted Octal Dump
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
8-466B	RL Monitor Subsystems P?S-08-1.1B
8-466D	RL Monitor System Utilities P?S-08-1.1D
8-477	RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System
8-481a	MERGE
8-488	NEWPAGE
8-492	BINLOAD, BINTAPE and SEARCH
8-502	Interrupt Duplicator for Binary Object Tapes
8-505	BIN-CBL Extended Memory Loader
8-506	Load Areas
8-512a	Modified Binary Loader
8-516	Self-Starting PS/8 Loader
8-523	MDT - A Mini Debugging Technique
8-527	XDDT8E
8-534	DUAL BINARY LOADER
8-535	BINARY PUNCH FOR PDP-8/E with 2 TTY's (or with high speed punch)
8-539	TD8E 4K Loader
8-541	Cassette Utility Program and PALC
8-561	Revised HELP Loader for High Speed Reader and New BIN Loader
8-570	BIN4SV
8-589a	BOOTST, Universal OS/8 (PS/8) Bootstrap
FOCAL8-98	FOCAL PUNCH OVERLAY
FOCAL8-215	FOCAL 1969 Octyl Loader
FOCAL8-219	Keyboard Controlled High Speed Punch Routine for FOCAL 1969
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)
FOCAL8-289	TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible With the TTY Intercom Terminal to CDC6000 Computer Series
FOCAL8-293	A Laboratory and Real Time Patch with FNEW FOCAL 5/69

V. DUPLICATION, VERIFICATION

DECUS NO.	TITLE
5/8-33	Tape to Memory Comparator
8-190	PATCH Utility Program
8-226	FAILSAFE for DECtape Library System
8-265	Teletype Parity Conversion Program
8-282	C528: Paper Tape Conversion 5 Track (SIRIUS) to 8 Track (A.S.C.I.I.)
8-291	Tape to Memory Comparator (6-channel)
8-311	Card to Tape Conversion with Diagnostics
8-360	ASCII to Friden (EIA)
8-374	Binary to RIM Consolidator
8-408	Disk Utility Program
8-415	Multiple Unit DECtape Copier
8-438	DF-32/Sykes Swap
8-439	MOVE
8-440	PIPL
8-471	Verify Paper Tape (12K)
8-481a	MERGE
8-488	NEWPAGE
8-541	Cassette Utility Program and PALC
8-572	Combination Lettering and Duplication-Coder Program
8-577a	Paper Tape Duplicator (P.D.T.)

VI. NUMERICAL FUNCTION, NUMERICAL INPUT-OUTPUT

DECUS NO.	TITLE
5/8-7	Decimal to Binary Conversion by Radix Deflation and Accelerated Radix Deflation
5/8-21	Triple Precision Arithmetic Package
5/8-35	BCD to Binary Conversion Subroutine and Binary to BCD Conversion Subroutine (Double Precision)
5/8-38	FType-Fractional Type
5/8-39	DSdprint, DDtype - Double Precision Signed Decimal Input-Output
5/8-43	Unsigned Octal - Decimal Fraction Conversion
8-44	Modifications to the Fixed Point Output in the PDP-8 Floating Point Package (Digital-8-5-S)
8-60	Square Root Function by Subtraction Reduction (Uses EAE)
8-61	Improvement to Digital-8-9-F Square Root
5/8-69	LESQ29 and LESQ11
8-70	EAE Routines for FORTRAN Operating System (DEC-Ø8-CFA3)
8-72	Matrix Inversion - Real Numbers
8-73	Matrix Inversion - Complex Numbers
8-74	Solution of System of Linear Equations: AX= B, by Inverting Matrix A, then Multiplying the Inverse by Vector B
8-75	Matrix Multiplication - Including Conforming Rectangular Matrices
8-80	Determination of Real Eigenvalues of a Real Matrix
8-93	CHEW - Convert Any BCD to Binary, Double Precision
8-96	J Bessel Function (FORTRAN)
8-100	Double Precision BCD Arithmetic Package (Incomplete)
8-103A	Four Word Floating Point Routines - Function Package
8-103B	Four Word Floating Point Routines - Rudimentary Calculator
8-103C	Four Word Floating Point Output Controller with Rounding
8-103D	Additional Instructions for use with Four Word Floating Point Package
8-114a	Decimal Output Routine for PDP-8 FORTRAN
8-115a	Double Precision Interpretive Package
8-134	LSQ (Least Squares Subroutine)
8-136	Fourier Transform Program
8-143	FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions
8-144	FFTS-C - A Fast Fourier Transform Subroutine for Complex Data
8-157	Square Root Patch
8-186	EAE FORTRAN Patch for the PDP-8
8-188	Extended Memory Patch for 4 Word Floating Point Package (DEC-08-FMHA-8B)
8-199	Accessing Data Arrays and Teletype Text Input/Output
8-207	Cube Root Subroutine
8-211	Matrix Manipulation System (MMS) for Real Numbers
8-214	DEC1: A Subroutine to Type Outputs in Decimal
8-218	Interpreter of Constitution of Coding Tables
8-220	FRACPT and TRANS
8-221	IFIX/FLOAT
8-248	SABR - Coded Fast Fourier Transform Subroutine
8-250	Fast Fourier Transform (FFT)
8-271	LIP, LOGICAL "If" Package
8-278	Single Length Floating Point Package
8-288	GRAYCONV (Gray Code to Binary Code Converter)
8-302	Overlay Modifications to the Floating-Point System Packages, DEC-08-YQYA
8-303	Alterations of the Basic Floating-Point Package and Additional Subroutines
8-304	Pseudo-Noise (P-N) Sequence Test
8-350	Wilcoxon-White Two Sample Rank Test
8-363	DATOUT: A Simple Routine for Printing Sequential Data as an Array
8-364	Extended Memory Patch to the 3-word Floating Point Arithmetic Interpreter
8-371	Teletype Control of ND 50/50 Memory Unit (TYPED)
8-375A	3 Page Floating Point Package
8-375B	3 Page Floating Point Package with Floating Output
8-379a	Double Precision and Floating Point Interchanger
8-399	8K FORTRAN Bit Manipulation Subroutines
8-410	Pseudo-Random Number Generator, EAE Version
8-426	Prime Number Generator

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

DECUS NO.	TITLE
8-428A	EAE - Modification to DECUS NO. 8-143, FFTS-R
8-428B	EAE - Modification to DECUS NO. 8-144, FFTS-C
8-432	Triple Precision Integer Package
8-436	EAE - Simulator
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-449D	Buffered I/O Subroutine for the PDP-8
8-452	ANSAM (Analog Sampling)
8-453	Rapid Alert Program (RAP)
8-480a	Two Subroutines for 8K FORTRAN 1. INPUT 2. RANDU and GAUSS
8-483	GRFIT, A Simple Least Squares Routine
8-485	Geometric Data Truncation for Fourier Transform Programs
8-491	Indexed Floating Point Math Subroutines for PDP-8/E
8-504C	ESI Demonstration Programs
8-511	FPAK-4 Interrupting Floating Point Package
8-538	Integer IOH for FORTRAN Library
8-550	Modified Matrix Inversion - Real Numbers
8-571	INPUT, OS/8 Version
8-575	EAE Overlay for Four-Word Floating Point Package Multiply
8-580	Decimal to Floating Point Conversion
8-582	Random Number Generator Adapted for 8K FORTRAN/SABR
8-590	Matrix Inversion
8-594	FP8 - Floating Point Arithmetic Software for DEC PDP-8 Series Computers
8-596	Multilength Routines
8-597	N.I.H. OS/8 Package
FOCAL8-1	A Pseudo Random Number Generator for the PDP-8 for use with FOCAL
FOCAL8-11	EAE Routines for FOCAL
FOCAL8-18	T-ASK
FOCAL8-33	Square Matrix Multiple; Prime Number Generator; Least Common Multiple; Base to Base Integer Conversion; Repeating Decimal
FOCAL8-34	Simultaneous Equations; Abbreviated Simultaneous Equations; Curve Fittings
FOCAL8-39	Rectangular to Polar Conversion; Polar to Rectangular Conversion
FOCAL8-47	Fourier Synthesis of a Square Wave
FOCAL8-49	Constantine's Function
FOCAL8-64	Newton-Raphson Method for Determination of Polynomial Roots
FOCAL8-68	Determination of Roots of a Polynomial
FOCAL8-73	Real Matrix Inversion
FOCAL8-74	Linear Least Squares Fit
FOCAL8-82	Physical Sine Curve Programs
FOCAL8-89	The Recursive Evaluation of Functions
FOCAL8-91	Multiplication of Rectangular Matrices
FOCAL8-100	Additions to FOCAL W
FOCAL8-106	FOCAL Traveling-Wave Sketches
FOCAL8-109	Newton's Method of Approximating Real Roots of P(x)=Ø, Where the Degree of P(x) is 4 or less
FOCAL8-118	Three Mathematical Routines 1. To Raise A+B*1 to the N Power 2. Complex Roots of Real Interpreters 3. Cube Root Finder
FOCAL8-120	PFI - Product Form of the Inverse
FOCAL8-142	Successive Powers of a Matrix
FOCAL8-143	Repeated Matrix Multiplication
FOCAL8-151	Fast Matrix Inversion for Real Numbers
FOCAL8-159A	Computer Programs in Use in the Water Qualities Division, Vol. 1
FOCAL8-159B	Computer Programs in Use in the Water Qualities Division, Vol. 2
FOCAL8-159C	Computer Programs in Use in the Water Quality Division, Vol. 3
FOCAL8-172	XPON
FOCAL8-174	SYNDIV 5
FOCAL8-182	First Order Differential Equation: Initial Value Problem
FOCAL8-194	Rectangular to Polar Coordination (German)
FOCAL8-200	SIMEQR-20 Simultaneous Equations in 8K FOCAL
FOCAL8-205	Random Walk/Array
FOCAL8-209	GRFIT, A Simple Least Squares Routine
FOCAL8-213	FOCAL Random Number Generator
FOCAL8-216	FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL
FOCAL8-231	Extended Precision Sine and Cosine for 4-word FOCAL
FOCAL8-232	Roots by Inverse Interpolation
FOCAL8-239	DIV - Program for Division
FOCAL8-253	Solution to Any Equation Involving 1 Variable
FOCAL8-255	Repeating Decimal
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 1969
FOCAL8-260	Arithmetic and Geometric Progressions
FOCAL8-263	ROOTS, A Polynomial Root Finder
FOCAL8-277	Newton Binomial
FOCAL8-278	A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$
FOCAL8-280	Improved Multiply Loop for FOCAL
FOCAL8-283	Improved EAE Routine for FOCAL
FOCAL8-284	8/E EAE Routine for FOCAL
FOCAL8-285	Online Graph - With Self Determining Scale Factor
FOCAL8-286	Arithmetic Practice
FOCAL8-298	Critical Points of a P(z) of Degree N (Real Coefficients)

VII. UTILITY

DECUS NO.	TITLE
5/8-32a	A Program to Relocate and Pack Programs in Binary Format
5-37	Transfer II
8-68a	LABEL Program
8-85	Set Memory Equal to Anything
8-87	XMAP
8-106	Readable Punch
8-110	Directory Print (DIREC) for the DEC PDP-8 Disk System
8-120	DISK/DECtape FAILSAFE
8-135	DNHELP, A Directory Assistor Program
8-141	SYSLUK
8-153	Tape/Disk Transfer Programs
8-154	SWAP
8-172	Octal Systems Edit
8-177	COPY
8-189	LKDN: Look into the Directory Name Block
8-190	PATCH Utility Program
8-198	SYSHLP - Monitor System Utility Program
8-204a	PATCH - A PDP-8 Binary Paper Tape Patch Program
8-205	MTSAFE
8-206	DUMP
8-210	A Real-Time Multiple Task Executive Program with Built-in Console Utility Package for PDP-8/S and PDP-8 Computers
8-217A	PALR
8-217B	PALM
8-217C	UTIL
8-232	TP1Ø
8-235	Octal Tape Dump for PDP-8/9/10 DECtapes
8-239	PAL III/Editor 8K Link Patch
8-240	END
8-244	BINSAVE
8-245	Dynamic Octal Disk Debugger
8-247	HELP: A Disk/DECtape Dialogue Program
8-252	PEEP - A Directory Search Program
8-270a	Disk-DECtape Utility Program
8-272	IOPACK - A Message and Number I-O Utility Package
8-294	Lettering Program
8-301	STOR: A Store Instruction for the PDP-8 Disk Monitor
8-309	Patches and a Utility Program for LAB-8
8-310	BIN Punch for Extended Memory
8-356	Page Printer
8-357	ISOMER - Interactive Study of Organic Molecules by Educational Reinforcement
8-358	Card Reader Patch
8-365	CARD
8-366	Modified Readable Punch
8-370A	FBUILD
8-370B	DISK
8-373	LISP Disk Array
8-378	Map Directory Information on KV8/I
8-393	Queing TCØ1/TU55 DECtape Routines
8-398	IMAGE
8-413	GROPE III/A and BINLOC
8-414	LIST
8-435	RECOVER
8-436	EAE - Simulator
8-438	DF-32/Sykes Swap
8-439	MOVE
8-440	PIPL
8-441	DELETE
8-444	COREMAP
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-449C	TALK1Ø-A PDP-8/PDP-10 Utility-Loader
8-449D	Buffered I/O Subroutines for the PDP-8
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
8-466D	RL Monitor System Utilities P?S-08-1.1D
8-466E	DECtape Utility Programs P?S-08-1.1E
8-473	Three Utility Routines for PS/8 1. DTA and DECLAB 2. CHANGE and REMOVE 3. LIST
8-474	EXIT PS/8
8-475	PIPQ
8-477	RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System
8-482	Patch to High ODT (DEC-08-COC2-PB)
8-484	REStore for the RKØ8
8-496	UTR7: A 7-track Magnetic Tape Reading Utility
8-506	Load Areas
8-508a	TSUTIL - A Utility-Diagnostic Program for TSS-8
8-522	'PAGEIT'
8-540B	BPRINT
8-541	Cassette Utility Program and PALC
8-545	PIF (Program Interrupt Facility for 3 TTY/s)
8-551	COMBO
8-563	TAPE
8-565	RENUM - Renumbering Program for BASIC Tapes
8-579	LISTIT
8-584	PRECIS, A Program to Scan a Binary Tape
8-586	XDIREC, OS/8-PS/8 Selective Directory Listing
8-588	PEEK, A User Program to Look at the TSS-8 Monitor
8-589a	BOOTST, Universal OS/8 (PS/8) Bootstrap
8-597	N.I.H. OS/8 Package
8-599	DIBILD.; Directory Rebuilder for PS/8 or OS/8

VII. UTILITY

DECUS NO.	TITLE
FOCAL8-10	Patch to FOCAL W for LINC-8 A-D Converter
FOCAL8-44	Magtape Analyser Using I/O FOCAL
FOCAL8-51	FOCAL "WRITE" Patch
FOCAL8-59	FOCAL Overlay Common Area for 4K Core Memory
FOCAL8-100	Additions to FOCAL W
FOCAL8-105A	LAB-8 Extended Functions for FOCAL (4K)
FOCAL8-105B	LAB-8 Extended Functions for FOCAL (8K)
FOCAL8-125a	Magtape Formatter for MTA Handler
FOCAL8-129	FOCAL Readable Punch
FOCAL8-150	FRAN8
FOCAL8-191	Reverse Overlay for FOCAL, 1969
FOCAL8-192	Echo Change for FOCAL, 1969
FOCAL8-194	Rectangular to Polar Coordination (German)
FOCAL8-195	All Purpose Graphing Program
FOCAL8-201	FOCAL Patch for Function FP, Mod 4B
FOCAL8-203	Graph Sketching
FOCAL8-204	Acid-Base Equilibria
FOCAL8-206	FOCAL Generates Binary Patches
FOCAL8-210	CHAIN and FCOM
FOCAL8-214	FDSK, An Overlay for FOCAL to Read Data-Or-Program-Files from the PS/8 Systems Device
FOCAL8-216	FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL
FOCAL8-245	Executive and Utility Routines for FOCLX, 1972
FOCAL8-247	FNEWS Overlay to Use High Speed Punch with FOCAL Program
FOCAL8-252	12K Overlay for FOCAL
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL 1969
FOCAL8-265	LISTAL
FOCAL8-291	DRANO
FOCAL8-292	CHCIG8

VIII. DISPLAY

DECUS NO.	TITLE
5/8-23A	PDP-5/8 Oscilloscope Symbol Generator (4X6 Matrix)
5/8-23B	PDP-5/8 Oscilloscope Symbol Generator (5X7 Matrix)
8-98	3D Draw for 338 Display
8-99A	Kaleidoscope
8-99B	Kaleidoscope - 338 Display
8-107	CHESSBOARD
8-108	Increment Mode Compiler (INCMOD)
8-109	SEETXT Subroutine
8-128	PDP-8 Oscilloscope Display of Mathematical Functions
8-131	SRCD, Software Rapid Character Display
8-132	STRIP, A Data Display and Analysis Program for the PDP-8, 8/I
8-149	Core Window
8-158	AX-Ø8 Symbol Generator
8-162	Demonstration Programs for the PDP-8
8-167	CIRCUITS
5/8-173	TIC 5/8
5/8-174	MEDIUM
8-175	Post Stimulus Interval Histogram for AX-Ø8
8-191	Fields
8-193	DISP
8-209	Editor-With-View
8-249	Oscilloscope Vector Generator
8-255	SCED: Scope Editor for the AXØ8
5-277	ICBM
8-289	"ULKA" The Ultimate Kaleidoscope
8-334	KVEDIT
8-373	LISP Disk Array
8-383A	Scan and Analysis Program
8-383B	Core Display Program
8-383C	Drawing Applications Program
8-411	Mongoose Display System
8-418A&B	VEKSEL and PAPT
8-423	Disk Editor With View for LAB-8
8-442	"The BYU Boob Tube"
8-450	PS/8 Editor with Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-455	CRTPAC
8-486	SEGAR 7: A Seven Segment Array for Alphanumeric Character Generation
8-514	Alpha-Numeric Display Program
8-547	Advanced Averager Program (Rotterdam Version)
8-552	Storage Display Device Handler
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display
8-598	CRT: An OS/8 Handler for Tektronix 611 Storage Scope
FOCAL8-6	FOCAL-8 Patch for LINC-8 Display
FOCAL8-7	STRIP FOCAL: Storage of Data Arrays in FOCAL
FOCAL8-57	FOCAL Display on a 338
FOCAL8-58	A Patch to FOCAL W to use the LINC-8 Display
FOCAL8-154	8K FOCAL Display
FOCAL8-187	Display FOCAL
FOCAL8-264	MEMORY, A Children's Game
FOCAL8-273	The Phi Phenomenon
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype
FOCAL8-292	CHCIG8

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

DECUS NO.	TITLE
5/8-51	Character Packing and Unpacking Routine
8-117	A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment
8-137a	Programs for Storage, Manipulation and Calculation of Data Using DECtape
8-224	PALT: Patch for Improved Text Handling for PAL-D
8-267	DARIC - Data Reduction in Columns
8-280	General Sorting Program
8-284	ASCO - Numerical Sort in Ascending Order
8-416b	Bibliographical Handling
8-418A&B	VEKSEL and PAPT
8-427a	MEMO II - Withdrawn
8-435	RECOVER
8-440	PIPL
8-441	DELETE
8-445	FYLHLP - PS/8 File Utility Program
8-449D	Buffered I/O Subroutines for the PDP-8
8-454	Radio Teletype to ASCII
8-457	DTFIX
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
8-469	Top Secret
8-472	PS8IN, PS8OUT
8-484	RESTore for the RKØ8
8-485	Geometric Data Truncation for Fourier Transform Programs
8-488	NEWPAGE
8-493	Line to Block Conversion
8-495	CORRELATION ANALYSIS
8-496	UTR7: A 7-track Magnetic Tape Reading Utility
8-519	MACRO-8 Pass 3 Output Format Patch
8-547	Advanced Averager Program (Rotterdam Version)
8-550	Modified Matrix Inversion - Real Numbers
8-562	DISORT
8-595	UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length
8-597	N.I.H. OS/8 Package
FOCAL8-7	STRIP FOCAL: Storage of Data Arrays in FOCAL
FOCAL8-180	FOCAL-SORT
FOCAL8-210	CHAIN and FCOM
FOCAL8-234	Action Indicator Calculator

X. PROBABILITY, STATISTICS, CURVE-FITTING

DECUS NO.	TITLE
5/8-9	Analysis of Variance - PDP-5/8
5-25	A Pseudo Random Number Generator for the PDP-5 Computer
5/8-69	LESQ29 and LESQ11
8-118	General Linear Regression
5/8-126	Cumulative Gaussian Distribution Curve Fitting
8-134	LSQ: Least Squares Subroutine
8-137a	Programs for Storage, Manipulation and Calculation of Data Using DECtape
8-243	Amplitude Distribution
8-283	A.V.S.C. (Analysis of Variance, Single Classification)
8-300	Noise Generator
8-316	CORR (Compute Correlation Matrix)
8-317	EIG (Compute Eigenvalues and Eigenvectors)
8-318	PART (Partitioning of Treatment Sums of Squares)
8-319	RAND (Computation of Random Fractions)
8-320	MMMS (Calculation of Minimum, Mean, Maximum and Standard Deviation)
8-321	REG-2 (Curvilinear Regression) REG-4 (Linear Regression)
8-322	CCMP (Correlation of Components and CVAL (Computes Values of Principal Components)
8-324	TSP - Trend Surface Plotting
8-327	CLAN (Cluster Analysis) and GRMN (Calculate Group Means)
8-328	NNAN (Nearest Neighbor Analysis) - OREG (Orthogonalized Regression Analysis) - OREH (Additional Orthogonal Regression Coefficients)
8-387	Grade Point Correlation
8-406	STATPAC Revisions for PDP-8/I and TSS/8
8-410	Pseudo-Random Number Generator, EAE Version
8-429	Intercorrelation 37
8-431	8/I LAB Data System
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time to Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-493	Line to Block Conversion
8-495	CORRELATION ANALYSIS
8-504C	ESI Demonstration Programs
8-520	PEST/WALD/PINIT: Adaptive Psychophysics Testing Package
8-547	Advanced Averager Program (Rotterdam Version)
8-549	Polynomial Least Squares Fit
8-554	ANOVA and DUNCAN
8-555	MULTC Multiple Correlation Program
8-556	CHISQ Chi Square Program

X. PROBABILITY, STATISTICS, CURVE FITTING

DECUS NO.	TITLE
8-557	CLUSTR Cluster Analysis Program
8-558	CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program
8-564	A Statistical System in PS/8
FOCAL8-14	Least Squares Fit to a Straight Line
FOCAL8-15	Least Squares Fit to a Cubic Polynomial
FOCAL8-16	One-Sample Statistics: Two-Sample Statistics: Welch Procedure; One-Way Analysis of Variance; Sheffe's Contrast Between Means
FOCAL8-19	Least Squares Fit to an Expcnential
FOCAL8-20	MULTIPULSE
FOCAL8-21	MULTIPULSE-2
FOCAL8-26	Curve Fitting
FOCAL8-28	Column Width; Traverse; Least Square "Linear Fit;" Weight Flow; Filter Design; Ohm's Law
FOCAL8-34	Simultaneous Equations; Abbreviated Simultaneous Equations; Curve Fittings
FOCAL8-37	N-th Degree Polynomial Data Point Fitting Routine; N-th Degree Polynomial Data Point Fitting Routine with RMS Error
FOCAL8-40	Simple Chi-Square Test
FOCAL8-61	Least Square Fit to a Polynomial
FOCAL8-63	CURFIT
FOCAL8-65	Kruskal-Wallis One-Way Analysis of Variance by Ranks
FOCAL8-66	"Quick Scan" - Using Scheffe's Calculation
FOCAL8-67	T-Test
FOCAL8-69	Analysis of Variance
FOCAL8-70	Analysis of Variance Randomized Block "F" Test
FOCAL8-72	General Least Squares Fit
FOCAL8-76	Screening Regression
FOCAL8-93	Dose-Response Routine
FOCAL8-96	Statistics - Standard Deviation
FOCAL8-108	Analysis of Variance for Two-Dimensional Material
FOCAL8-109	Newton's Method of Approximating Real Roots of P(x)=Ø, Where the Degree of P(x) is 4 or Less
FOCAL8-115	Short Programs for Statistical Analysis Using FOCAL
FOCAL8-117	ED-50
FOCAL8-124	Analysis of Variance Package
FOCAL8-128	Probability (2P); From t ("Student") Distribution
FOCAL8-130	FLHSTO
FOCAL8-131	ZAREA
FOCAL8-137	General Nth Order Regression
FOCAL8-138	WCXT: The Wilcoxon Matched-Pairs Signed-Ranks Test for Non Parametric Data
FOCAL8-160	Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test
FOCAL8-165	F- (Variance Ratio) Distribution Probability
FOCAL8-166A & 166B	First and Second Order Partial Correlations
FOCAL8-167	Five Statistical Programs for the PDP-8 or PDP-12
FOCAL8-170	Saint Peter's College Statistical Package
FOCAL8-171	Minnesota Sociology Statistics Programs
FOCAL8-193	Anova, 2-way, Unsymmetrical
FOCAL8-196	Fisher's Exact Text
FOCAL8-208	A Normally Distributed Random Number Generator in FOCAL
FOCAL8-221	LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation
FOCAL8-236	Polynomial Curve Fitting (Streamlined Programs)
FOCAL8-243	Analysis of Variance for One-Two-and Three-Treatment Designs for a PDP-8
FOCAL8-250	Six Curves: GMS037
FOCAL8-261	Chi Square Utility Package, CHISQR
FOCAL8-266	STATPACK, An Interactive Statistical Package
FOCAL8-276	The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data
FOCAL8-290	Kolmogorov-Smirnov Test for Narmality

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
8-49	Relativistic Dynamics
8-65	A Programmed Associative Multichannel Analyser
8-90	Histogram on Teletype Subroutine
8-92	Analysis of Pulse-Height Analyzer Test
8-117	A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment
8-118	General Linear Regression
8-133	First Order Kinetics
8-143	FFTS-R- A Fast Fourier Transform Subroutine for Real Valued Functions
8-144	FFTS-C - A Fast Fourier Transform Subroutine for Complex Data
8-145	Time-of-Flight Analyzer
8-161	EXPO - A Flexible PDP-8 Data Acquisition Program
8-167	CIRCUITS
8-169	Physical Oceanography Data Reduction Programs for the PDP-8 (11 Parts - See abstract)
8-171	Real-Time System for Behavioral Science Experiments
8-175	Post Stimulus Interval Histogram for AX-Ø8
8-194	NMR Simulator
8-208	Evaluating Determinants (from 2-17)
8-223	Power Spectrum
8-237	MADCAP IV, A Multiplex ADC and Analog Plotting Program

XI. SCIENTIFIC APPLICATION ENGINEERING APPLICATION

DECUS NO.	TITLE
8-238	EPRSIM, An Electron Paramagnetic Resonance Simulator
8-254	Vector Algebra Package
8-258	NMRCAT-29: A Simplified Signal Averager Program
8-260	TOFAST - Fast Direct and Inverse Discrete Fourier Transform Routines
8-279	Bar Chart Plotting Subroutine
8-292	Fast Fourier Transform and Fast Walsh-Fourier Transform
8-293	Atomic Coordinate Program
8-299	Latency Histogram and Calculation
8-323	CRC (Convert Peak Heights on an Auto-Analyzer Chart to PPM and Percentage)
8-325	SBSM - Calculation of Duplicate Sub-Samples from Primary Data
8-326	MLWI - Malawi Land Use Survey Analysis
8-339A	PST (Post Stimulus Time) and Latency Histogram for the LAB-8
8-339B	Time Interval Histogram Program
8-340	The Auto and Cross-Correlation Program for the LAB-8
8-342	STAP-8; Spike Train Analysis Program
8-347	DUBAVG
8-371	Teletype Control of ND 50/50 Memory Unit (TYPED)
8-396	MTS-6/70 (Millisecond Time-Sharing System)
8-419	Nmr-Pulse for the Lab-8/I
8-420	LOGSIM-8
8-424	Morse Code
8-431	8/I LAB Data System
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC(TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-453	Rapid Alert Program (RAP)
8-459	TAYEX - Taylor Expansion Equation Solver
8-468	DIPDUB, A Dual-Independent Parameter, Double-Precision Pulse-Height Analysis Code
8-483	GRFIT, A Simple Least Squares Routine
8-501	Galactic Coordinates
8-514	Alpha-Numeric Display Program
8-520	PEST/WALD/PINIT: Adaptive Psychophysics Testing Package
8-524	GRNDYE 1970 - A Program to Estimate Cardiac Output Off-line from an Indicator Dilution Curve
8-525	DAFFT/PAFFT/DAQUAN(EAE)
8-529	OSCAR: An Operating System for Computerized Animal Research
8-536	Advanced Averager Improvement
8-542	Radioactive Decay
8-547	Advanced Averager Program (Rotterdam Version)
8-559	CUBIC
8-566	PARTL
8-567	EXPO
8-568	CFI - Continued Fraction Inversion
8-578	Chromaticity Diagram
8-591	Pulmonary Resistance
FOCAL8-20	MULTIPULSE
FOCAL8-21	MULTIPULSE-2
FOCAL8-22	Monte Carlo Solution to Neutron Penetration Problem
FOCAL8-23	Seismic Refraction Sloping Layer Program
FOCAL8-24	GRADE: A Grade Averaging and Display Program
FOCAL8-27	Δ -Y Complex; Y - Δ Complex; Series Resonant Circuit Analysis
FOCAL8-28	Column Width; Traverse; Least Square "Linear Fit," Nozzle Weight Flow; Filter Design; Ohm's Law
FOCAL8-29	Second Order Differential Equation
FOCAL8-30	One Line Routines; X^3 and Circle; Superposition; Circle
FOCAL8-31	Sines; Factors; Figure Eight; Right Triangle Solutions
FOCAL8-35	Rootfinder Program
FOCAL8-36	Determinot Program
FOCAL8-38	Magic Square Generator
FOCAL8-48	A FOCAL Program to Determine Low-Frequency Loudspeaker Parameters Experimentally
FOCAL8-50	FOCAL Version of RC Active Filter
FOCAL8-54	Channel Information and Inverted Histogram Plot
FOCAL8-55	Multichannel Analyzer
FOCAL8-62	THE FOCAL TGH Clinical Package
FOCAL8-64	Newton-Raphson Method for Determination of Polynomial Roots
FOCAL8-68	Determination of Roots of a Polynomial
FOCAL8-83	Gas Law Programs
FOCAL8-86	KCF Temperature Conversion Table
FOCAL8-88	Atomic and Molecular Transition Probabilities in FOCAL
FOCAL8-93	Dose-Response Routine
FOCAL8-94	Multidimensional Integration by Gaussian Quadrature
FOCAL8-102	Solution of Quadratic Equations with Complex Coefficients
FOCAL8-113	Acid-Base Titration Curves
FOCAL8-114	Liquid Scintillation Data Processing Program
FOCAL8-119	CHEMS LAB 5
FOCAL8-132	CIG-8 MARK II
FOCAL8-147	Interaction Analysis

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XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
FOCAL8-152	Surface Plate Auto-Collimation
FOCAL8-162	Transistor H-Parameter Conversions
FOCAL8-163	Erlang C Blocking Probability Programs
FOCAL8-175	Modifications and Supplement to FOCAL8-50 RC Filter Design and Plot and 3-Pole Butterworth Filters
FOCAL8-176	Program for Producing Histograms from Clinical Data on Teletype
FOCAL8-181	Filter Design
FOCAL8-198	Michaelis-Menten Kinetics
FOCAL8-204	Acid-Base Equilibria
FOCAL8-207	EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator
FOCAL8-209	GRFIT, A Simple Least Squares Routine
FOCAL8-217	Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations With Given Initial Conditions
FOCAL8-220	Individual Tablet Assay
FOCAL8-221	LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation
FOCAL8-222	Center of Gravity Calculations
FOCAL8-226	Frequency Transformation Program
FOCAL8-227a	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-228	Great Circle Distance Between 2 Points
FOCAL8-229	H-800 Wiring Diagrams
FOCAL8-233	A FOCAL-Correlation Program for the LAB-8 System 1. Auto- and Cross-Correlation Program 2. Auto-Correlation Program
FOCAL8-235	MPS Radiation Pattern Program
FOCAL8-238	Millikan Oil Drop Experiment
FOCAL8-241	Satellite Orbital Parameters
FOCAL8-242	Solution of Linear Equation Systems With Symmetrically Matrix
FOCAL8-258	Hearing Loss Simulator
FOCAL8-262	Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug
FOCAL8-263	ROOTS, A Polynomial Root Finder
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)
FOCAL8-273	The Phi Phenomenon
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype
FOCAL8-293	A Laboratory and Real Time Patch with FNEW FOCAL 5/69
FOCAL8-296	FOCALINUS
FOCAL8-297	LUNGS - A System of Programs for the Calculation of Selected Cardiorespiratory Parameters

XII. HARDWARE CONTROL

DECUS NO.	TITLE
8-58	One-Page DECtape Routine
8-77	PDP-8 Dual Process System
8-82	Library System for 580 Magnetic Tape (Preliminary Version)
8-104	Card Reader Subroutine for the PDP-8 FORTRAN Compiler
8-121	DECtape Handler
8-201	DECSW
8-224	PALT: Patch for Improved Text Handling for PAL-D
8-225	CR8/I Overlay for PAL III Assembler
8-229	Card III Overlay
8-246	DF32 Disk Routines
8-258	NMRCAT-29: A Simplified Signal Averager Program
8-264	CLOK - AXØ8 RC Clock or External Clock Frequency or Period Measurement
8-285	Teletype Input-Output Package
8-287	A PDP-8 Program to Provide Teletype Entry into the IBM JET System
8-312	DECtape Emulator
8-343	Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8
8-381	Cardreader Subroutine for Disk Editor
8-424	Morse Code
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-449A	A Magtape Handler for the PDP-8/TU20
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-452	ANSAM (Analog Sampling)
8-455	CRTPAC
8-457	DTFIX
8-458	VW - Field Independent I/O Handler for Disk and TTY
8-464b	MTA: TRØ2 Magnetic Tape Handler for PS/8
8-490	Tape Alteration Program
8-496	UTR7: A 7-track Magnetic Tape Reading Utility
8-498	Unencoded Incremental Plotter Subroutine
8-499	High-Speed Reader Patch for Lo-Speed Macro-8
8-509	INTERRUPT - TEST
8-537	Talking Eights
8-552	Storage Display Device Handler

XII. HARDWARE CONTROL

DECUS NO.	TITLE
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display
8-574	TD8E System Handler for 8K PS/8
8-592	Printer Test Program
8-597	N.I.H. OS/8 Package
8-598	CRT: An OS/8 Handler for Tektronix 611 Storage Scope
FOCAL8-44	Magtape Analyser Using I/O FOCAL
FOCAL8-45	Universal I/O Handler for FOCAL
FOCAL8-80	Using the High Speed Punch with FOCAL
FOCAL8-224	SPASTIC - A System for Programming Angles, Scaler, and Timer by Internal Counting
FOCAL8-227a	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-230	CALCOMP Plotter FNEW PLOTX

XIII. GAME, DEMONSTRATION

DECUS NO.	TITLE
5/8-14	Dice Game for the PDP-5/8
5/8-15	ATEPO (Auto Test in Elementary Programming and Operation of a PDP-5 Computer)
5/8-54	TIC-TAC-TOE Learning Program - T3
8-71	Perpetual Calendar
8-79	TIC-TAC-TOE (Trinity College)
8-94A	BLACKJACK
8-94B	BLACKJACK "Overlays"
8-98	3D Draw for 338 Display
8-99A	Kaleidoscope
8-99B	Kaleidoscope - 338 Display
8-107	CHESSBOARD
8-108	Increment Mode Compiler (INCMOD)
8-112	Sentence Generator
8-119	Off-Line TIC-TAC-TOE Program for the PDP-8 Computer
8-151	On-Line TIC TAC TOE
8-152a	PDP-8 Music Programs
8-162	Demonstration Programs for the PDP-8
5/8-173	TIC 5/8
5/8-174	MEDIUM
8-191	Fields
8-196	DET - Detect Key Words
8-215	Hexapawn
8-219	LISS
8-261	QUBIC
8-269	Morse Code Trainer
8-275	Grade Compiler
5-277	ICBM
8-289	"ULKA" The Ultimate Kaleidoscope
8-308	PDP-8 Morse Code Sender
8-331	Roulette
8-332	The Civil War Game
8-346	Pollution Game

DECUS NO.	TITLE
8-353	Disk Monitor Patch for BLACKJACK
8-359	Hi-Q Game Playing Program
8-361	Game of Chance
8-388	CALENDAR
8-394	BASIC MOO
8-395	Space War
8-401	Dice Game and TIC-TAC-TOE
8-424	Morse Code
8-426	Prime Number Generator
8-430	DECK: A Random Deck of Cards
8-437	Computer Dating Game
8-442	"The BYU Boob Tube"
8-462	INSTIN
8-463	Perpetual Calendar (BASIC Version)
8-469	Top Secret
8-494	Translate Arabic Into Roman Numerals
8-504C	ESI Demonstration Programs
8-517	Bowling League Results, Standings and Averages Program
8-521	A CLOCK
8-528	TIC-TAC-TOE: Modifications to TIC 5/8, DECUS NO. 8-173
8-537	Talking Eights
8-545	PIF (Program Interrupt Facility for3 TTY's)
8-560	SAM-1
8-563	TAPE
FOCAL8-5	The Sumer Game
FOCAL8-9	Hexapawn
FOCAL8-38	Magic Square Generator
FOCAL8-41	FRAN THE BARMAID
FOCAL8-42	The Hangman Game
FOCAL8-46	4-DIGIT, 12-Bit Word Practice
FOCAL8-71	FOCAL Golf Program for the PDP-8 (8K) Computer
FOCAL8-75	Blackjack
FOCAL8-77	MARX: A Grading Program
FOCAL8-78	RACK-O
FOCAL8-79	The Carnival Game
FOCAL8-81	FOCAL Lunar Landing Simulation (APOLLO)
FOCAL8-92	FOCAL Horserace for the PDP-8 (8K) Computer
FOCAL8-95	One-Armed Bandit
FOCAL8-99	3 Dimensional TIC TAC TOE (3X3X3)
FOCAL8-101	"HORSERACE"
FOCAL8-103	TEACH
FOCAL8-104	The Towers of Hanoi
FOCAL8-107	NIM
FOCAL8-111	Battle of Numbers Game (Newberry College Version)
FOCAL8-112	TIC-TAC-TOE (FOCAL)
FOCAL8-121	Play Golf With Arnold Palmer
FOCAL8-122	Charge Account
FOCAL8-127	FOCAL - SLOT
FOCAL8-134	1-20 Counting Game
FOCAL8-146	Zeller's Congruence/Day of the Week
FOCAL8-149	Checkers
FOCAL8-156	Blackjack for FOCAL

XIII. GAME, DEMONSTRATION

DECUS NO.	TITLE
FOCAL8-158	Mileage Program
FOCAL8-168	One-Armed Bandit - PDP-8 Style
FOCAL8-169	FOCAL Version of the GE Basic Artillery Game
FOCAL8-173	APOLLO II
FOCAL8-183	DARTS
FOCAL8-185	LIFE
FOCAL8-186	SUMER (FRENCH)
FOCAL8-197	Self-Teaching Program for FOCAL
FOCAL8-199	Stock Market Game
FOCAL8-228	Great Circle Distance Between 2 Points
FOCAL8-229	H-800 Wiring Diagrams
FOCAL8-240	Science Fiction Quiz
FOCAL8-244	HANGMAN IV
FOCAL8-246	Undefeatable FOCAL TIC-TAC-TOE
FOCAL8-251	12K Overlay for FOCAL
FOCAL8-257	LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM
FOCAL8-264	MEMORY, A Children's Game
FOCAL8-267	BLACKJACK for FOCAL, 1969
FOCAL8-270	MONOPOLY
FOCAL8-273	The Phi Phenomenon
FOCAL8-279	MUSECL MUSI6
FOCAL8-281	French Language FOCAL, 5/69
FOCAL8-286	Arithmetic Practice

XIV. PLOTTING

DECUS NO.	TITLE
5-30	GENPLOT - General Plotting Subroutine
5-31a	FORPLOT
8-147	Incremental Plotter Printout Subroutine
8-148	Plotter System
8-168	CalComp Plotting Package
8-202	PLOT
8-203	ALPHA
8-263	XYPLOT - A Versatile Plot Routine for the D/A Converter
8-279	Bar Chart Plotting Subroutine
8-367	Digital 8-12-U Modified
8-498	Unencoded Incremental Plotter Subroutine
FOCAL8-4	PRIME PLOTS
FOCAL8-12	QUIP1 - Quick Plot in Quadrant 1
FOCAL8-13	3D PLOTTER
FOCAL8-84	2D Plotter for Serial Experimental Data
FOCAL8-90	X-Y Plotter for FOCAL '69
FOCAL8-97	Multiple Equation Graphing on a Teletype
FOCAL8-126	PLOTTER
FOCAL8-195	All Purpose Graphing Program

XV. DESK CALCULATOR, BUSINESS APPLICATION

DECUS NO.	TITLE
5-5	Expanded Adding Machine
8-122A	SNAP (Simplified Numerical Analysis) Without EAE
8-122B	SNAP (Simplified Numerical Analysis) With EAE
8-155	HEP
8-192	T.A.L.C.: Taylor's Algebraic Linear Calculator
8-231	Data Processing on the PDP-8/S
8-251	A System for Production of Problem Sets with Individualized Data
8-275	Grade Compiler
8-453	Rapid Alert Program (RAP)
8-504A	ESI (Engineering and Scientific Interpreter)
8-504B	ESIX - Extended ESI
8-595	UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length
FOCAL8-25	Payroll Calculations (California, 1968)
FOCAL8-56	Merchandise Price Tags
FOCAL8-60	A System for Production of Problem Sets with Individualized Data
FOCAL8-122	Charge Account
FOCAL8-184	Manpower
FOCAL8-225	Loan Amortization Schedule
FOCAL8-227a	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-234	Action Indicator Calculator
FOCAL8-237	Bond Computations
FOCAL8-249	Payroll Listings and Totals
FOCAL8-282	CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars
FOCAL8-295	ATTND - Monthly Attendance Reporting Module
FOCAL8-299	FOPAY - Weekly Payroll Deductions and Computations

XVI. MAINTENANCE

DECUS NO.	TITLE
5-10	Paper Tape Reader Tester
8-222	Disk Memory Retention Test
8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-444	COREMAP
8-509	INTERRUPT - TEST

XVII. MISCELLANEOUS

DECUS NO.	TITLE
8-362	IOFMAG
8-403	Stereo - A 2 Channel Music Program
8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-472	PS8IN, PS8OUT
8-540A	BRAILLE-8
8-540B	BPRINT
8-548	Links to Page Routine
8-561	Revised HELP Loader for High Speed Reader and New BIN Loader

FOCAL8-85	Program Replication
FOCAL8-87	Keyboard Readable Punch
FOCAL8-155	FACTORS
FOCAL8-161	Wilmot Grading Program
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL 1969
FOCAL8-258	Hearing Loss Simulator

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
8-49	Relativistic Dynamics
8-65	A Programmed Associative Multichannel Analyser
8-90	Histogram on Teletype Subroutine
8-92	Analysis of Pulse-Height Analyzer Test
8-117	A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment
8-118	General Linear Regression
8-133	First Order Kinetics
8-145	Time-of-Flight Analyzer
8-161	EXPO - A Flexible PDP-8 Data Acquisition Program
8-167	CIRCUITS
8-169	Physical Oceanography Data Reduction Programs for the PDP-8 (11 Parts - See abstract)
8-171	Real-Time System for Behavioral Science Experiments
8-175	Post Stimulus Interval Histogram for AX-Ø8
8-194	NMR Simulator
8-208	Evaluating Determinants (from 2-17)
8-223	Power Spectrum
8-237	MADCAP IV, A Multiplex ADC and Analog Plotting Program
8-238	EPRSIM, An Electron Paramagnetic Resonance Simulator
8-254	Vector Algebra Package
8-258	NMRCAT-29: A Simplified Signal Averager Program
8-260	TOFAST - Fast Direct and Inverse Discrete Fourier Transform Routines
8-279	Bar Chart Plotting Subroutine
8-292	Fast Fourier Transform and Fast Walsh-Fourier Transform
8-293	Atomic Coordinate Program
8-299	Latency Histogram and Calculation
8-323	CRC (Convert Peak Heights on an Auto-Analyzer Chart to PPM and Percentage)
8-325	SBSM - Calculation of Duplicate Sub-Samples from Primary Data
8-326	MLWI - Malawi Land Use Survey Analysis
8-339A	PST (Post Stimulus Time) and Latency Histogram for the LAB-8
8-339B	Time Interval Histogram Program
8-340	The Auto and Cross-Correlation Program for the LAB-8
8-342	STAP-8; Spike Train Analysis Program
8-347	DUBAVG
8-371	Teletype Control of ND 50/50 Memory Unit (TYPED)
8-396	MTS-6/70 (Millisecond Time-Sharing System)
8-419	Nmr-Pulse for the Lab-8/I
8-420	LOGSIM-8
8-424	Morse Code
8-431	8/I LAB Data System
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC(TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-453	Rapid Alert Program (RAP)
8-459	TAYEX - Taylor Expansion Equation Solver
8-468	DIPDUB, A Dual-Independent Parameter, Double-Precision Pulse-Height Analysis Code
8-483	GRFIT, A Simple Least Squares Routine
8-501	Galactic Coordinates
8-514	Alpha-Numeric Display Program
8-520	PEST/WALD/PINIT: Adaptive Psychophysics Testing Package
8-524	GRNDYE 1970 - A Program to Estimate Cardiac Output Off-line from an Indicator Dilution Curve
8-525	DAFFT/PAFFT/DAQUAN(EAE)
8-529	OSCAR: An Operating System for Computerized Animal Research
8-536	Advanced Averager Improvement
8-542	Radioactive Decay
8-547	Advanced Averager Program (Rotterdam Version)
8-559	CUBIC
8-566	PARTL
8-567	EXPO
8-568	CFI - Continued Fraction Inversion
8-578	Chromaticity Diagram
8-591	Pulmonary Resistance
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program
8-617	V.A. PKS.-1 and V.A. PKS.-2, Real Time G. C. Data Integrator and G. C. Data Manipulator
8-620	The PHA-8 Data Acquisition System
8-620A	SINGS - Single Parameter, Single Precision, 1024 Channel, PHA Data Acquisition
8-620B	SINGDP - Single Parameter, Double Precision, 1024 Channel, PHA Data Acquisition and Display
8-620C	PK8L - 1024 Channel Off-Line Peak Location and Listing
8-620D	SING8K - Single Parameter, Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display
8-620E	PK8K - 4096 Channel Off-Line Peak Location and Listing
8-626	Automated Electrooculography
8-630	Pulmonary Funcrion Laboratory Programs
8-638	GEOMAS
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-648	LOGMIN - Logic Minimization Program
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files

XI. SCIENTIFIC APPLICATION/ ENGINEERING APPLICATION

DECUS NO.	TITLE
8-143	FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions
8-144	FFTS-C - A Fast Fourier Transform Subroutine for Complex Data

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
FOCAL8-20	MULTIPULSE
FOCAL8-21	MULTIPULSE-2
FOCAL8-22	Monte Carlo Solution to Neutron Penetration Problem
FOCAL8-23	Seismic Refraction Sloping Layer Program
FOCAL8-24	GRADE: A Grade Averaging and Display Program
FOCAL8-27	Δ -Y Complex; Y - Δ Complex; Series Resonant Circuit Analysis
FOCAL8-28	Column Width; Traverse; Least Square "Linear Fit," Nozzle Weight Flow; Filter Design; Ohm's Law
FOCAL8-29	Second Order Differential Equation
FOCAL8-30	One Line Routines; X^3 and Circle; Superposition; Circle
FOCAL8-31	Sines; Factors; Figure Eight; Right Triangle Solutions
FOCAL8-35	Rootfinder Program
FOCAL8-36	Determinot Program
FOCAL8-38	Magic Square Generator
FOCAL8-48	A FOCAL Program to Determine Low-Frequency Loudspeaker Parameters Experimentally
FOCAL8-50	FOCAL Version of RC Active Filter
FOCAL8-54	Channel Information and Inverted Histogram Plot
FOCAL8-55	Multichannel Analyzer
FOCAL8-62	THE FOCAL TGH Clinical Package
FOCAL8-64	Newton-Raphson Method for Determination of Polynomial Roots
FOCAL8-68	Determination of Roots of a Polynomial
FOCAL8-83	Gas Law Programs
FOCAL8-86	KCF Temperature Conversion Table
FOCAL8-88	Atomic and Molecular Transition Probabilities in FOCAL
FOCAL8-93	Dose-Response Routine
FOCAL8-94	Multidimensional Integration by Gaussian Quadrature
FOCAL8-102	Solution of Quadratic Equations with Complex Coefficients
FOCAL8-113	Acid-Base Titration Curves
FOCAL8-114	Liquid Scintillation Data Processing Program
FOCAL8-119	CHEMS LAB 5
FOCAL8-132	CIG-8 MARK II
FOCAL8-147	Interaction Analysis
FOCAL8-152	Surface Plate Auto-Collimation
FOCAL8-162	Transistor H-Parameter Conversions
FOCAL8-163	Erlang C Blocking Probability Programs
FOCAL8-175	Modifications and Supplement to FOCAL8-50 RC Filter Design and Plot and 3-Pole Butterworth Filters
FOCAL8-176	Program for Producing Histograms from Clinical Data on Teletype
FOCAL8-181	Filter Design
FOCAL8-198	Michaelis-Menten Kinetics
FOCAL8-204	Acid-Base Equilibria
FOCAL8-207	EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator
FOCAL8-209	GRFIT, A Simple Least Squares Routine
FOCAL8-217	Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations With Given Initial Conditions
FOCAL8-220	Individual Tablet Assay
FOCAL8-221	LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation
FOCAL8-222	Center of Gravity Calculations
FOCAL8-226	Frequency Transformation Program
FOCAL8-227	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-228	Great Circle Distance Between 2 Points
FOCAL8-229	H-800 Wiring Diagrams
FOCAL8-233	A FOCAL-Correlation Program for the LAB-8 System 1. Auto- and Cross-Correlation Program 2. Auto-Correlation Program
FOCAL8-235	MPS Radiation Pattern Program
FOCAL8-238	Millikan Oil Drop Experiment
FOCAL8-241	Satellite Orbital Parameters
FOCAL8-242	Solution of Linear Equation Systems With Symmetrically Matrix
FOCAL8-258	Hearing Loss Simulator
FOCAL8-262	Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug
FOCAL8-263	ROOTS, A Polynomial Root Finder
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)
FOCAL8-273	The Phi Phenomenon
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype

DECUS NO.	TITLE
12-1	EEG Data Collection (BNI Series)
12-4	IRDA
12-15	HISTO12
12-22	PLOTFFT
12-23	CFFT
12-34	STAP-12
12-35	Bioelectric Signal Sorter (JULIA)
12-41	BLOOPD - Blood Pressure Display Program
12-43	PLOT3D
12-44	AVERDT
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments
12-55	FFAESIM
12-62	RUFUS
12-63	OLFFT1 and FETCHFFT
12-65	PISH - Poststimulus Time and Interspike-Interval Histogram
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers
12-72	Four-Point Smoothing with FPP-12
12-73	8-Point Quadratic Smooth with FPP-12
12-80	FOCAL - RT
12-89	BUTFLTR
12-94	DATAN
12-97	An Off-Line FOCAL-12 Program for Auto Analyzers by TWX

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
12-98	HERALD - Analog-Digital Average and Standard Error Program
12-101	OS/8 SKED
12-104	CORDATFP
12-107	AVUPTO8, AVUPTO8S
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-121	Arrhythmia Detection and Categorization
12-125	Waveform Analysis
12-126	WAVEFORM: Evoked Potential Analysis

DECUS NO.	TITLE
L-4.1	IN HISTO
L-10	LINC-8 Multianalyzer
L-11	DATUM8
L-25	LINC Spectrum Program
L-33	On-Line LABCOM System (Version 4)
L-40	Averager System for the Classic LINC
L-82	Root Solver - Real Coefficients
L-84	SEPAN/Sequential Pattern Analysis
L-89	ECGAV8
L-90	TDIST
L-91	PROG 2
L-92	SPKDET
L-96	SIGAVE1, SIGAVE2, SIGAVE3, SIGAVE4 and EVRANA
L-104A	JIH (Joint Interval Histogram)
L-104B	JIHE - Joint Interval Histogram (English Version)
L-113	PDIS - A PDP-8 Routine to Access the LINCscope

XII. HARDWARE CONTROL

DECUS NO.	TITLE
8-58	One-Page DECtape Routine
8-77	PDP-8 Dual Process System
8-82	Library System for 580 Magnetic Tape (Preliminary Version)
8-104	Card Reader Subroutine for the PDP-8 FORTRAN Compiler
8-121	DECtape Handler
8-201	DECSW
8-224	PALT: Patch for Improved Text Handling for PAL-D
8-225	CR8/I Overlay for PAL III Assembler
8-229	Card III Overlay
8-246	DF32 Disk Routines
8-258	NMRCAT-29: A Simplified Signal Averager Program
8-264	CLOK - AXØ8 RC Clock or External Clock Frequency or Period Measurement
8-285	Teletype Input-Output Package
8-287	A PDP-8 Program to Provide Teletype Entry into the IBM JET System
8-312	DECtape Emulator
8-343	Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8
8-381	Cardreader Subroutine for Disk Editor
8-424	Morse Code
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-449A	A Magtape Handler for the PDP-8/TU20
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-452	ANSAM (Analog Sampling)
8-455	CRTPAC
8-457	DTFIX
8-458	VW - Field Independent I/O Handler for Disk and TTY
8-464a	TRØ2 Magnetic Tape Device Handler for PS/8
8-490	Tape Alteration Program
8-496	UTR7: A 7-track Magnetic Tape Reading Utility
8-498	Unencoded Incremental Plotter Subroutine
8-499	High-Speed Reader Patch for Lo-Speed Macro-8
8-509	INTERRUPT - TEST
8-537	Talking Eights
8-552	Storage Display Device Handler
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display
8-574	TD8E System Handler for 8K PS/8
8-592	Printer Test Program
8-597	N.I.H. OS/8 Package
8-598	CRT: An OS/8 Handler for Tektronix 611 Storage Scope
8-614	Clock Calibration
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-622	KV8/I - VTØ1 Device Handler
8-645	Interfacing the PDP-8 to the Printec-100 Line Printer
FOCAL8-44	Magtape Analyser Using I/O FOCAL
FOCAL8-45	Universal I/O Handler for FOCAL
FOCAL8-80	Using the High Speed Punch with FOCAL
FOCAL8-224	SPASTIC - A System for Programming Angles, Scaler, and Timer by Internal Counting
FOCAL8-227	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-230	CALCOMP Plotter FNEW PLOTX
12-29	LINC-10
12-75	FORTRAN Subroutines for the PDP-12
12-114	FOCAL-PL
L-6	TRIGGR
L-18	BUFFER - Fully Buffered Teletype I/O
L-23	Control to Designate Left or Right LINC-8 Tape Transports as Unit Zero
L-70	A LINC-8 Program to Provide for Entry Into the IBM JET System
L-85	DPT-1 Real-Time Clock
L-106	Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8
L-113	PDIS - A PDP-8 Routine to Access the LINCscope
L-116	TEXTOUT Subroutine
L-118	ECHO Keyboard Subroutine
L-119	Keyboard Subroutine

XIII. GAME, DEMONSTRATION

DECUS NO.	TITLE
5/8-14	Dice Game for the PDP-5/8
5/8-15	ATEPO (Auto Test in Elementary Programming and Operation of a PDP-5 Computer)
5/8-54	TIC-TAC-TOE Learning Program - T3
8-71	Perpetual Calendar
8-79	TIC-TAC-TOE (Trinity College)
8-94A	BLACKJACK
8-94B	BLACKJACK "Overlays"
8-98	3D Draw for 338 Display
8-99A	Kaleidoscope
8-99B	Kaleidoscope - 338 Display
8-107	CHESSBOARD
8-108	Increment Mode Compiler (INCMOD)
8-112	Sentence Generator
8-119	Off-Line TIC-TAC-TOE Program for the PDP-8 Computer
8-151	On-Line TIC TAC TOE
8-152a	PDP-8 Music Programs
8-162	Demonstration Programs for the PDP-8
5/8-173	TIC 5/8
5/8-174	MEDIUM
8-191	Fields
8-196	DET - Detect Key Words
8-215	Hexapawn
8-219	LISS
8-261	QUBIC
8-269	Morse Code Trainer
8-275	Grade Compiler
5-277	ICBM
8-289	"ULKA" The Ultimate Kaleidoscope
8-308	PDP-8 Morse Code Sender
8-331	Roulette
8-332	The Civil War Game
8-346	Pollution Game
8-353	Disk Monitor Patch for BLACKJACK
8-359	Hi-Q Game Playing Program
8-361	Game of Chance
8-388	CALENDAR
8-394	BASIC MOO
8-395	Space War
8-401	Dice Game and TIC-TAC-TOE
8-424	Morse Code
8-426	Prime Number Generator
8-430	DECK: A Random Deck of Cards
8-437	Computer Dating Game
8-442	"The BYU Boob Tube"
8-462	INSTIN
8-463	Perpetual Calendar (BASIC Version)
8-469	Top Secret
8-494	Translate Arabic Into Roman Numerals
8-504C	ESI Demonstration Programs
8-517	Bowling League Results, Standings and Averages Program
8-521	A CLOCK
8-528	TIC-TAC-TOE: Modifications to TIC 5/8, DECUS NO. 8-173
8-537	Talking Eights
8-545	PIF (Program Interrupt Facility for3 TTY's)
8-560	SAM-1
8-563	TAPE
8-643	LIFE
8-647	FULMIX - Complete Permutation Program
FOCAL8-5	The Sumer Game
FOCAL8-9	Hexapawn
FOCAL8-38	Magic Square Generator
FOCAL8-41	FRAN THE BARMAID
FOCAL8-42	The Hangman Game
FOCAL8-46	4-DIGIT, 12-Bit Word Practice
FOCAL8-71	FOCAL Golf Program for the PDP-8 (8K) Computer
FOCAL8-75	Blackjack
FOCAL8-77	MARX: A Grading Program
FOCAL8-78	RACK-O
FOCAL8-79	The Carnival Game
FOCAL8-81	FOCAL Lunar Landing Simulation (APOLLO)
FOCAL8-92	FOCAL Horserace for the PDP-8 (8K) Computer
FOCAL8-95	One-Armed Bandit
FOCAL8-99	3 Dimensional TIC TAC TOE (3X3X3)
FOCAL8-101	"HORSERACE"
FOCAL8-103	TEACH
FOCAL8-104	The Towers of Hanoi
FOCAL8-107	NIM
FOCAL8-111	Battle of Numbers Game (Newberry College Version)
FOCAL8-112	TIC-TAC-TOE (FOCAL)
FOCAL8-121	Play Golf With Arnold Palmer
FOCAL8-122	Charge Account
FOCAL8-127	FOCAL - SLOT
FOCAL8-134	1-20 Counting Game
FOCAL8-146	Zeller's Congruence/Day of the Week
FOCAL8-149	Checkers
FOCAL8-156	Blackjack for FOCAL
FOCAL8-158	Mileage Program
FOCAL8-168	One-Armed Bandit - PDP-8 Style
FOCAL8-169	FOCAL Version of the GE Basic Artillery Game
FOCAL8-173	APOLLO II
FOCAL8-183	DARTS
FOCAL8-185	LIFE
FOCAL8-186	SUMER (FRENCH)
FOCAL8-197	Self-Teaching Program for FOCAL
FOCAL8-199	Stock Market Game
FOCAL8-228	Great Circle Distance Between 2 Points
FOCAL8-229	H-800 Wiring Diagrams
FOCAL8-240	Science Fiction Quiz
FOCAL8-244	HANGMAN IV
FOCAL8-246	Undefeatable FOCAL TIC-TAC-TOE
FOCAL8-251	12K Overlay for FOCAL
FOCAL8-257	LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM
FOCAL8-264	MEMORY, A Children's Game
FOCAL8-267	BLACKJACK for FOCAL, 1969
FOCAL8-270	MONOPOLY
FOCAL8-273	The Phi Phenomenon
FOCAL8-279	MUSECL MUSI6
FOCAL8-281	French Language FOCAL, 5/69
FOCAL8-286	Arithmetic Practice

XIII. GAME, DEMONSTRATION

DECUS NO.	TITLE
12-21	Modified MAGSPY
12-36	Hangman for PDP-12
12-60	SUMER (French)
12-71	Snoopy Display Program
12-85	APOLLO 12
12-86	ORGAN-AA and ORGAN+BA
12-103	$HAPPY

L-2.1	Clock 1 for LINC; Clock 8 for LINC-8
L-39	SPCWAR
L-74	Obsolete
L-87a	SNOOPY Display Program for the LINC-8
L-121A	HISTOG
L-123	Towers of Hanoi

XIV. PLOTTING

DECUS NO.	TITLE
5-30	GENPLOT - General Plotting Subroutine
5-31a	FORPLOT
8-147	Incremental Plotter Printout Subroutine
8-148	Plotter System
8-168	CalComp Plotting Package
8-202	PLOT
8-203	ALPHA
8-263	XYPLOT - A Versatile Plot Routine for the D/A Converter
8-279	Bar Chart Plotting Subroutine
8-367	Digital 8-12-U Modified
8-498	Unencoded Incremental Plotter Subroutine
8-629	Graphing Subroutines for 8K FORTRAN Programs
12-42	CALCO12
12-59	FOCPLOT
12-70	COMPLT
12-78	PUBPLOT
12-84	AVERAGER
12-106	$PLOT
12-107	AVUPTO8, AVUPTO8S
12-114	FOCAL-PL
FOCAL8-4	PRIME PLOTS
FOCAL8-12	QUIP1 - Quick Plot in Quadrant 1
FOCAL8-13	3D PLOTTER
FOCAL8-84	2D Plotter for Serial Experimental Data
FOCAL8-90	X-Y Plotter for FOCAL '69
FOCAL8-97	Multiple Equation Graphing on a Teletype
FOCAL8-126	PLOTTER
FOCAL8-195	All Purpose Graphing Program
L-9a	LINC-CalComp Plot Subroutine Package
L-24	PLTKBD - Plotkeyboard
L-77	Extended PROGOFOP to Drive An Inexpensive X-Y Plotter
L-78	XY Plotter Maintenance Programs, XYSET and XYTEST
L-81	FOCDAT
L-107	Digital 8-12-U Modified
L-112	FSUPLOT: X-Y Plotter Routine for GRAPHA
L-121A	HISTOG

XV. DESK CALCULATOR, BUSINESS APPLICATION

DECUS NO.	TITLE
5-5	Expanded Adding Machine
8-122A	SNAP (Simplified Numerical Analysis) Without EAE
8-122B	SNAP (Simplified Numerical Analysis) With EAE
8-155	HEP
8-192	T.A.L.C.: Taylor's Algebraic Linear Calculator
8-231	Data Processing on the PDP-8/S
8-251	A System for Production of Problem Sets with Individualized Data
8-275	Grade Compiler
8-453	Rapid Alert Program (RAP)
8-504A	ESI (Engineering and Scientific Interpreter)
8-504B	ESIX - Extended ESI
8-595	UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length
8-607	CALCU1
8-610	INVENT-8
FOCAL8-25	Payroll Calculations (California, 1968)
FOCAL8-56	Merchandise Price Tags
FOCAL8-60	A System for Production of Problem Sets with Individualized Data
FOCAL8-122	Charge Account
FOCAL8-184	Manpower
FOCAL8-225	Loan Amortization Schedule
FOCAL8-227	FOCL/F-An Extended Version of 8K FOCAL'69
FOCAL8-234	Action Indicator Calculator
FOCAL8-237	Bond Computations
FOCAL8-249	Payroll Listings and Totals
FOCAL8-282	CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars

DECUS NO.	TITLE
L-105	INVEN: Creation and Storage of an Inventory

XVI. MAINTENANCE

DECUS NO.	TITLE
5-10	Paper Tape Reader Tester
8-222	Disk Memory Retention Test
8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-444	COREMAP
8-509	INTERRUPT - TEST
8-608	FUTIL - OS/8 File Utility
8-614	Clock Calibration
8-624	DUMP and LOAD, TSS/8
12-16	MODCLK
L-26	RELTS8-1C

XVII. MISCELLANEOUS

DECUS NO.	TITLE
8-362	IOFMAG
8-403	Stereo - A 2 Channel Music Program
8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-472	PS8IN, PS8OUT
8-540A	BRAILLE-8
8-540B	BPRINT
8-548	Links to Page Routine
8-561	Revised HELP Loader for High Speed Reader and New BIN Loader
8-602 A&B	The PDP-8 Cookbook, Volume 1 & 2
8-616	Octal Character Equivalent
8-654	Cabrillo Test Grader
8-656	SELFDRILL - The Sloan Selfdrill Program
FOCAL8-85	Program Replication
FOCAL8-87	Keyboard Readable Punch
FOCAL8-155	FACTORS
FOCAL8-161	Wilmot Grading Program
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL 1969
FOCAL8-258	Hearing Loss Simulator
12-5	SERCHPRO
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-49	Cold Start DR32 Disk Formatter for PS/8 on a PDP-12
12-52	Student Test Analysis
12-102	A Manual for the PDP-12 Operator
L-27	Q & A Subroutine (Modification for LAP6 Characters)
L-100	LEAP or 8-Library Index Printer
L-113	PDIS - A PDP-8 Routine to Access the LINCscope
L-117	SEARCH Bibliography System
L-121C	FRACDISP
L-121D	KBDPNCH

26. Purchasing

0 Unclassified
1 Preparing Purchase Orders
2 Matching Invoices
3 Accounts Payable
4 Purchase Analysis

27. Marketing

0 Unclassified
1 Sales and Billings Forecasting
2 Promotion and Advertising
3 Bid or Request Analysis
4 Distribution or Territory Analysis

28. Sales Entered and Billed

0 Unclassified
1 Order Entry and Scheduling
2 Invoicing
3 Accounts Receivable
4 Sales and Billing Analysis
5 Backlog Reporting

29. General Business Services

0 Unclassified
1 Records Retention
2 Forms Management
3 Transportation
4 Printing and Reproduction

30. Demonstrations and Games

0 Unclassified
1 Display
2 Participation

40. Arithmetic Routines

0 Unclassified
1 Real Numbers
2 Complex Numbers
3 Decimal
4 Floating Point

41. Elementary Functions

0 Unclassified
1 Trigonometric
2 Hyperbolic
3 Exponential and Logarithmic
4 Roots and Powers
5 Geometry
6 Logical and Rounded

42. Polynomials and Special Functions

0 Unclassified
1 Evaluation of Polynomials
2 Roots of Polynomials
3 Evaluation of Special Functions
4 Simultaneous Non-Linear Algebraic Equations
5 Simultaneous Transcendental Equations

43. Operations on Functions and Solutions of Differential Equations

0 Unclassified
1 Numerical Integrations
2 Numerical Solutions of Ordinary Differential Equations
3 Numerical Solutions of Partial Differential Equations
4 Numerical Differentiation

44. Interpolation and Approximations

0 Unclassified
1 Table Look-up and Interpolation
2 Curve Fitting
3 Smoothing

45. Operations on Matrices, Vectors and Simultaneous Linear Equations

0 Unclassified
1 Matrix Operations
2 Eigenvalues and Eigenvectors
3 Determinates
4 Simultaneous Linear Equations
5 Vector Analysis

50. Insurance

0 Unclassified
1 Life
2 Fire
3 Pension and Welfare

61. Education

0 Unclassified
1 Demonstrations
2 Problem Solving
3 Record Keeping

62. Literary Data Processing

0 Unclassified
1 General
2 Language and Literature
3 Linguistics
4 Language Translation
5 Concordances
6 Content Analysis
7 Text Editing
8 Bibliographic Analysis
9 Text Manipulation

63. Humanities

0 Unclassified
1 General
2 Music
3 History
4 Art

71. Hybrid Computing

0 Unclassified
1 Analog/Digital, Digital/Analog Conversion
2 Real Time Computing
3 Simulation

72. Time Sharing

0 Unclassified

99. Miscellaneous

0 Unclassified

DECUS NO.	TITLE
8-334	KVEDIT
8-370A	FBUILD
8-370B	DISK
8-391a	7 or 9 Ttack MTA for PS-8 with TC-58/TU-20
8-398	IMAGE
8-421	Chain Load
8-425	Block-Modify for PS/8
8-427a	Withdrawn
8-439	MOVE
8-440	PIPL
8-441	DELETE
8-445	FYLHLP - PS/8 File Utility Program
8-450	PS/8 Editor with Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-464b	MTA: TRØ2 Magnetic Tape Handler
8-472	PS8IN, PS8OUT
8-473	Three Utility Routines for PS/8 1. DTA and DECLAB 2. CHANGE and REMOVE 3. LIST
8-474	EXIT PS/8
8-475	PIPQ
8-476	Obsolete
8-477	RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System
8-478	Obsolete
8-497A.1	8BAL - PDP-8 Macro Language
8-497B	8BAL Source Documentation
8-500	DUMP8
8-516	Self-Starting PS/8 Loader
8-517	Bowling League Results, Standings and Averages Program
8-518	PS/8 FORTRAN Alphabetical Sort
8-530	8BALIB - 8BAL Macro Library Generator
8-531B	'TRIPLE' 8BAL Macros
8-536	Advanced Averager Improvement
8-538	Integer IOH for FORTRAN Library
8-549	Polynomial Least Squares Fit
8-550	Modified Matrix Inversion - Real Numbers
8-552	Storage Display Device Handler
8-554	ANOVA and DUNCAN
8-555	MULTC Multiple Correlation Program
8-556	CHISQ Chi Square Program
8-557	CLUSTR Cluster Analysis Program
8-558	CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program
8-562	DISORT
8-564	A Statistical System in PS/8
8-570	BIN4SV
8-571	INPUT, OS/8 Version
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display
8-574	TD8E System Handler for 8K PS/8
8-576	LOCAL PAL8: LPAL8.SV
8-585	FAC HANDLER
8-586	XDIREC, OS/8-PS/8 Selective Directory Listing
8-589a	BOOTST, Universal OS/8 (PS/8) Bootstrap
8-591	Pulmonary Resistance
8-595	UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length
8-597	N.I.H. OS/8 Package
8-598	CRT: An OS/8 Handler for Tektronix 611 Storage Scope
8-599	DIBILD.; Directory Rebuilder for PS/8 or OS/8

FOCAL8-125a	MTA Formatter for TC-58/TU-20 with PS/8
FOCAL8-148	FOCL.S - An Expanded Language for Small Computers, Based on FOCAL
FOCAL8-227a	FOCL/F - An Extended Version of 8K FOCAL 69
FOCAL8-265	LISTAL
FOCAL8-266	STATPACK, An Interactive Statistical Package
FOCAL8-268	FX Function for Random Access Files
FOCAL8-269	4K FOCAL '69 Speed-Up Patches
FOCAL8-270	MONOPOLY
FOCAL8-271	Modification of FOCL/F for Data Acquisition and Control
FOCAL8-292	CHCIG8

DECUS PROGRAM LIBRARY
PDP-8 NUMERICAL INDEX
VOLUME I

NO.	TITLE	MEDIA/PRICE CODES
5/8-1.1a	BPAK - A Binary Input/Output Package for the PDP-5	D01, F02
5/8-2.1a	OPAK - An On-Line Debugging Package	D01, F02
5-4	Octal Typeout of Memory Area with Format Option	D01
5-5	Expanded Adding Machine	D01
5/8-7	Decimal to Binary Conversion by Radix Deflation and Accelerated Radix Deflation	D01
5/8-9	Analysis of Variance - PDP-5/8	D01, F02
5-10	Paper Tape Reader Tester	A01, F02, W00
5/8-14	Dice Game for the PDP-5/8	A01, F02, W00
5/8-15	ATEPO (Auto Test in Elementary Programming and Operation of a PDP-5 Computer)	A01, F02, W00
5/8-18A	BIN Tape Disassembly Program for PDP-5/8	D01, F02
5/8-18C	Disassembler with Symbols	A01, B07, F02, G06
8-19a	DDT-UP Octal-Symbolic Debugging Program	A01, B07, F02
5/8-20	Remote Operated FORTRAN System	D01, F02, G02
5/8-21	Triple Precision Arithmetic Package	D01, F02, G06
5/8-23A	PDP-5/8 Oscilloscope Symbol Generator (4x6 Matrix)	D01, F02
5/8-23B	PDP-5/8 Oscilloscope Symbol Generator (5x7 Matrix)	D01, F02, G02
5-25	A Pseudo Random Number Generator for the PDP-5 Computer	D01, F02
8-26A	Compressed Binary Loader	D01, F02
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5/8-27a	Bootstrap Loader and Absolute Memory Clear	D01, F02
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5-31a	FORPLOT	A01, F02, G02, W00
5/8-32a	A Program to Relocate and Pack Programs in Binary Format	D01, F02
5/8-33	Tape to Memory Comparator	D01, G02
5/8-35	BCD to Binary Conversion Subroutine and Binary to BCD Conversion Subroutine (Double Precision)	D01, G02
5-37	Transfer II	A01, F02, G02, W00
5/8-38	FType - Fractional Type	D01, F02
5/8-39	DSdprint, DDtype - Double Precision Signed Decimal Input - Output	D01, F02
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8-44	Modifications to the Fixed Point Output in the PDP-8 Floating Point Package (Digital 8-5-S)	D01, F02, G02
5/8-45	PDP-5/8 Remote and Time Shared II System	A01, F06, G02, W00
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8-52	Tiny Tape Editor	D01, F02, G02
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5/8-55	PALEX - An On-Line Debugging Program for PDP-5 and PDP-8 Computers	D01, F02, G06
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8-60	Square Root Function by Subtraction Reduction (Uses EAE)	D01, G02
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8-64a	4K and 8K DECtape Programming System	A01, H21, W00
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8-67	PAL Modified for DECtape Input (Uses EAE)	D01, F02, G02
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8-70	EAE Routines for FORTRAN Operating System (DEC-08-CFA3)	D01, F02, G02
8-71	Perpetual Calendar	D01, F02, G06
8-72	Matrix Inversion - Real Numbers	D01, F02, G02
8-73	Matrix Inversion - Complex Numbers	D01, F02, G02
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8-75	Matrix Multiplication - Including Conforming Rectangular Matrices	D01, F02, G02
8-77	PDP-8 Dual Process System	A01, B05, F02, G06
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5/8-83 A&B	Octal Debugging Program (With or without Floating Point)	D01, F06, G06
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8-87	XMAP	D01, F02, G06, H12
8-89	XOD - Extended Octal Debugging Program	A01, B07, F02, G06
8-90	Histogram on Teletype Subroutine	D01, G02
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8-93	CHEW - Convert Any BCD to Binary, Double Precision	D01, G02
8-94A	BLACKJACK	D01, F02, G06
8-94B	BLACKJACK "Overlays"	D01, F02, G02
8-95	TRACE for EAE	D01, F02, G02
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8-99A	Kaleidoscope	D01, F02, G02

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8-100	Double Precision BCD Arithmetic Package (Incomplete)	D01, G02	
8-102a	A LISP Interpreter for the PDP-8	D01, B12, F02	
8-103A	Four Word Floating Point Routines - Functions Package	D01, F02, G06	
8-103B	Four Word Floating Point Routines - Rudimentary Calculator	D01, F02, G06	
8-103C	Four Word Floating Point Output Controller with Rounding	D01, F02, G06	
8-103D	Additional Instructions for use with Four Word Floating Point Package	D01, F02, G02	
8-104	Card Reader Subroutines for the PDP-8 FORTRAN Compiler	D01, F02, G06	
8-105	D-BUG	D01, F02, G02	
8-106	Readable Punch	D01, F02, G02	
8-107	CHESSBOARD	A01, B05, F02	
8-108	Increment Mode Compiler (INCMOD)	A01, B05, F02	
8-109	SEETXT Subroutine	A01, B07, F02	
8-110	Directory Print (DIREC) for the DEC PDP-8 Disk System	A01, B05, F02	
8-111	DISKLOOK	A01, B05, F02	
8-112	Sentence Generator	D01, F02, G06	
8-114a	Decimal Output Routine for PDP-8 FORTRAN	D01, F02	
8-115a	Double Precision Interpretive Package	D01, F02, G06	
8-117	A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment	D01	
8-118	General Linear Regression	D01, G02	
8-119	Off-Line TIC-TAC-TOE Program for the PDP-8 Computer	A01, B07, F02, G06	
8-120	DISK/DECtape FAILSAFE	A01, B05, F02, G02	
8-121	DECtape Handler	D01, F02, G02	
8-122A	SNAP (Simplified Numerical Analysis) Without EAE	A01, F02, W00	
8-122B	SNAP (Simplified Numerical Analysis) With EAE	A01, F02, W00	
8-123	UNIDEC Assembler	A01, B07, H12, R19	
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8-125	PDP-8 Relocatable Assembler for IBM 360/50 and above	A01, H12, R19, W00	

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5/8-126	Cumulative Gaussian Distribution Curve Fitting	D01, G02
8-127	XDDT Extended Octal - Symbolic Debugging Program	A01, B07, F02
8-128	PDP-8 Oscilloscope Display of Mathematical Functions	D01, G02
8-129	Magnetic Tape Program Library System	D01, F02, G06
8-130A	REBIL8 - Relocating Binary Loader	D01, F02, G02
8-130B	RELCON - Binary to Relocatable Binary Tape Converter	D01, F02, G02
8-131	SRCD, Software Rapid Character Display	A01. W00
8-132	STRIP, A Data Display and Analysis Program for the PDP-8, 8/I	D01, F02
8-133	First Order Kinetics	D01, F02, G06
8-134	LSQ (Least Squares Subroutine)	D01, F02, G02
8-135	DNHELP, A Directory Assistor Program	A01, B05, F02
8-136	Fourier Transform Program	D01, G02
8-137a	Programs for Storage, Manipulation and Calculation of Data Using DECtape	D01, G02, H12
8-141	SYSLUK	A01, B05, F02
8-142	Binary Punch - Extended Memory	D01, F02, G02
8-143	FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions	A01, B07, F02, H12 — On same DECtape*
8-144	FFTS-C - A Fast Fourier Transform Subroutine for Complex Data	A01, B07, F02, H12 — On same DECtape*
8-145	Time-of-Flight Analyzer	D01, F02
8-146	High Speed Executive for the PDP-8, 8/I	D01, G02
8-147	Incremental Plotter Printout Subroutine	D01, F02, G06
8-148	Plotter System	A01, F02, W00
8-149	Core Window	D01, F02, G02
8-150	PTOD8 High and PTOD8 Low	D01, F02
8-151	On-Line TIC-TAC-TOE	A01, F02, G02, W00
8-152a	PDP-8 Music Programs	D01, F02, G02
8-153	Tape/Disk Transfer Programs	D01, H16
8-154	SWAP	A01, B05, F02
8-155	HEP	A01, F02, W00
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* Please specify DECsystem-10 or OS/8 format when ordering.

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8-157	Square Root Patch	D01, F02, G02
8-158	AX-08 Symbol Generator	D01, F02, G02
8-159	CINET-BASIC	A01, F02, W00
8-160	FASTLOAD	D01, F02
8-161	EXPO - A Flexible PDP-8 Data Acquisition Program	A01, B07, F02
8-162	Demonstration Programs for the PDP-8	A01, F06, W00
8-166	Interim Technical Report, The PDPMAP Assembly System	A01, W00
8-167	CIRCUITS	A01, B07, F02, G06
8-168	CalComp Plotting Package	D01, H11, H12
8-169	Physical Oceanography Data Reduction Programs for the PDP-8	
8-169A	Temperature Formatting	D01, F02, G06
8-169B	Pack Thermometer Calibration	D01, F02, G06
8-169C	Thermometer Correction	D01, F02, G06
8-169D	Pressure Curve Fit	D01, F02, G06
8-169E	Final Pass	D01, F02, G06
8-169F	PNUM	D01, F02, G06
8-169G	PLOPRM	D01, F02, G06
8-169H	Distance and Bearing	D01, F02, G02
8-169I	Formatting of Chemistry	D01, F02, G02
8-169J	Department PLOTCO	D01, F02, G02
8-169K	Additions to Floating Point Package	D01, F02, G02
8-170	FORTRAN Source Conversion Program	D01, F02, G02
8-171	Real-Time System for Behavioral Science Experiments	A01, B13, F06
8-172	Octal Systems Edit	A01, B05, F02, G06
5/8-173	TIC 5/8	A01, F02, W00
5/8-174	MEDIUM	A01, F02, W00
8-175	Post Stimulus Interval Histogram for AX-08	A01, B05, F02
8-176	PAL CHOP	D01, F02, G02
8-177	COPY	A01, B05, F02, G06
8-178	Reverse Assembler	A01, B07, F02, G06
8-179	EAE Modifications for Binary Disassembler with Symbols	D01, F02, G02
8-180	Editor and Assembler for 57A Magnetic Tape System (UCRL-50534)	A01, B05, G06

NO.	TITLE	MEDIA/PRICE CODES
8-181	Automatic Binary Loader and Duplicator-Coder for Auto Bin	A01, B05, F02, G06
8-182	Memory Compare	D01, F02, G02
8-183	The WANG Loader	D01, F02
8-184	Page Routine	D01, F02, G02
8-185	Modifications to Symbolic Editor and Symbolic Tape Format Generator	D01, F02
8-186	EAE FORTRAN Patch for the PDP-8	D01, F02
8-187	Keyboard Controlled Binary Punch	D01, F02, G02
8-188	Extended Memory Patch for 4 Word Floating Point Package (DEC-08-FMHA-8B)	D01, F02
8-189	LKDN: Look into the Directory Name Block	A01, F02, W00
8-190	PATCH Utility Program	A01, B05, F02
8-191	Fields	A01, B05, F02
8-192	T.A.L.C.: Taylor's Algebraic Linear Calculator	A01, F02, W00
8-193	DISP	D01, F02, G06
8-194	NMR Simulator	A01, B07, F02, G06
8-195	POLY BASIC	A01, B13, F06
8-196	DET - Detect Key Words	D01, F02
8-197	Overlay for Standard Editor and PAL III Assembler	D01
8-198	SYSHLP - Monitor Systems Utility Program	A01, B07, F02
8-199	Accessing Data Arrays and Teletype Text Input/Output	A01, G02, W00
8-200A	BOSS	D01, F02
8-200B	DECtape BOSS for PDP-8 Computers	A01, F02, W00
8-201	DECSW	D01, F02, G02
8-202	PLOT	A01, B07, F02, G02
8-203	ALPHA	A01, B07, F02, G02
8-204a	PATCH - A PDP-8 Binary Paper Tape Patch Program	A01, B07, F02, G06
8-205	MTSAFE	A01, B05, F02, G02
8-206	DUMP	A01, F02, G06, W00
8-207	Cube Root Subroutine	D01, F02, G02
8-208	Evaluating Determinants (from 2-17)	D01
8-209	Editor-With-View	A01, F02, W00

NO.	TITLE	MEDIA/PRICE CODES
8-210	A Real-Time Multiple Task Executive Program with Built-In Console Utility Package for PDP-8/S and PDP-8 Computers	A01, B07, F02
8-211	Matrix Manipulation System (MMS) for Real Numbers	A01, F02, W00
8-212b	PALH (Modified)	D01, F02, G06
8-213	4K ALGOL	A01, F06, H12, W00
8-214	DECI: A Subroutine to Type Outputs in Decimal	D01, F02, G02
8-215	Hexapawn	A01, B07, F02, H12
8-216	PAL-D Patch	D01, F02, G02
8-217A	PALR	D01, F02, G02
8-217B	PALM	D01, F02, G02
8-217C	UTIL	D01, F02, G06
8-218	Interpreter of Constitution of Coding Tables	D01, F02
8-219	LISS	A01, F02, W00
8-220	FRACPT and TRANS	D01, F02, G02
8-221	IFIX/FLOAT	D01, G02
8-222	Disk Memory Retention Test	D01, F02
8-223	Power Spectrum	A01, B05, F02, G06
8-224	PALT: Patch for Improved Text Handling for PAL-D	D01, F02
8-225	CR8/I Overlay for PAL III Assembler	D01, F02, G02
8-226	FAILSAFE for DECtape Library System	D01, F02, G02
8-227	PDP-10/8 - Loader	D01, F02, G02
8-228	A One-Pass Paper Tape Loader for PDP-8 Disk System (OPLOAD)	A01, F02, G02, W00
8-229	Card III Overlay	D01, F02, G02
8-230	Foreground/Background/8 Now	D01, G02
8-231	Data Processing on the PDP-8/S	A01, W00
8-232	TP10	D01, F02, G06
8-233	An Octal Housekeeping and Debugging Package for PDP-8(PDP-8/I) with EAE and Disk	A01, B07, F02, G06
8-234	SYS/LOAD PUNCH	D01, F02, G02
8-235	Octal Tape Dump for PDP-8/9/10 DECtapes	A01, B07, F02, G06
8-236	System and User Files Read and Punch Program (LEES)	A01, F02, G02, W00

NO.	TITLE	MEDIA/PRICE CODES
8-237	MADCAP IV, A Multiplex ADC and Analog Plotting Program	A01, B12, F06, G10, H12
8-238	EPRSIM, An Electron Paramagnetic Resonance Simulator	A01, B07, F02
8-239	PAL III/Editor 8K Link Patch	D01, F02, G02
8-240	END	D01, F02, G02
8-241	BUZZTAPE READER/WRITER	D01, F02, G02
8-242	DATAC I	A01, F02, G08, W00
8-243	Amplitude Distribution	D01, F02, G06
8-244	BINSAVE	D01, F02, G06
8-245	Dynamic Octal Disk Debugger	D01, F02
8-246	DF32 Disk Routines	A01, G06, W00
8-247	HELP: A Disk/DECtape Dialogue Program	D01, F02, G02
8-248	SABR - Coded Fast Fouries Transform Subroutine	D01, F02, G06
8-249	Oscilloscope Vector Generator	D01, F02, G02
8-250	Fast Fourier Transform (FFT)	A01, B07, F02, G06
8-251	A System for Production of Problem Sets with Individualized Data	D01, F02, G02
8-252	PEEP- A Directory Search Program	D01, F02, G06
8-253	Disk Dump on Scope	D01, F02, G06
8-254	Vector Algebra Package	D01, F02, G02
8-255	SCED: Scope Editor for the AX08	A01, F02, G06, W00
8-256	Binary to RIM Format Converter	D01, F02, G02
8-257	UCONN-EAP, Editor-Assembler	A01, F02, W00
8-258	NMRCAT-29: A Simplified Signal Averager Program	A01, F02, G06, W00
8-259	Symbolic from Pass 3	D01, F02, G06
8-260	TOFAST - Fast Direct and Inverse Discrete Fourier Transform Routines	D01, F02, G06
8-261	QUBIC	D01, F02, G06
8-262	Character Overflow Change to PDP-8 PAL 3	D01
8-263	XYPLOT - A Versatile Plot Routine for the D/A Converter	D01, G02
8-264	CLOK - AX08 RC Clock or External Clock Frequency or Period Measurement	D01, F02, G06
8-265	Teletype Parity Conversion Program	D01, F02, G06
8-266	IBM Editor	D01, F02
8-267	DARIC - Data Reduction in Columns	D01, F02, G06

NO.	TITLE	MEDIA/PRICE CODES
8-268	Miniloader and Miniloader Punch	D01, F02, G02
8-269	Morse Code Trainer	A01, B07, F02, G06
8-270a	Disk-DECtape Utility Program	A01, B07, F06, G06
8-271	LIP, LOGICAL "If" Package	D01, F02, G02
8-272	IOPACK - A Message and Number I-O Utility Package	D01, G02
8-273	Algonquin Assembler	D01, F02
8-274	Card Reader Patch to Phoenix Assembler	D01, F02
8-275	Grade Compiler	D01, F02
8-276	Core Editor	D01, F02, G02
5-277	ICBM	D01, F02, G02
8-278	Single Length Floating Point Package	D01, F02, G06
8-279	Bar Chart Plotting Subroutine	D01, G02
8-280	General Sorting Program	D01, F02, G06
8-281a	Binary Tape Splicer ASR 33/75A	D01, F02, G02
8-282	C528: Paper Tape Conversion 5 Track (SIRIUS) to 8 Track (A.S.C.I.I.)	D01, G02
8-283	A.V.S.C. (Analysis of Variance, Single Classification)	D01, G02
8-284	ASCO - Numerical Sort in Ascending Order	D01, G02
8-285	Teletype Input-Output Package	D01, G02
8-286	Two Patches for Disassembler with Symbols	D01, F02, G02
8-287	A PDP-8 Program to Provide Teletype Entry into the IBM JET System	D01, F02, G02
8-288	GRAYCONV (Gray Code to Binary Code Converter)	D01, G02
8-289	"ULKA" - The Ultimate Kaleidoscope	D01, F02
8-290	Skinny BIN Loader	A01, F02, G02, W00
8-291	Tape to Memory Comparator (6-channel)	D01, F02, G02
8-292	Fast Fourier Transform and Fast Walsh-Fourier Transform	A01, B07, F02, G06
8-293	Atomic Coordinate Program	A01, B07, F02
8-294	Lettering Program	D01, F02, G02
8-295	COMBIN	D01, F02, G02
8-296	Edit Routine	D01, F02
8-297	TRACE	A01, B07, F02
8-298	OCTMON - An Octal Monitor for the PDP-8	A01, B07, F06, G06
8-299	Latency Histogram and Calculation	A01, B07, F02, G06

NO.	TITLE	MEDIA/PRICE CODES
8-300	Noise Generator	D01, G02
8-301	STOR: A Store Instruction for the PDP-8 Disk Monitor	D01, F02
8-302	Overlay Modifications to the Floating-Point System Packages, DEC-08-YQYA	D01, F06
8-303	Alterations of the Basic Floating-Point Package and Additional Subroutines	D01
8-304	Pseudo-Noise (P-N) Sequence Test	D01, F02, G02
8-305	PAL III Assembler Overlay for Card Reader Input	D01, F02, G06
8-306	LDR - A One Pass Transparent Loader	A01, G06, W00
8-308	PDP-8 Morse Code Sender	D01, F02, G02
8-309	Patches and a Utility Program for LAB-8	D01, F02, G02
8-310	BIN Punch for Extended Memory	D01
8-311	Card to Tape Conversion with Diagnostics	D01, F02, G06
8-312	DECtape Emulator	D01, F02, G02
8-314	8K FORTRAN Library CR8/I Card Reader Input Routine	A01, B05, F02, G02
8-315	Block-Modify	D01, F02, G02
8-316	CORR (Compute Correlation Matrix)	D01, G02
8-317	EIG (Compute Eigenvalues and Eigen-vectors)	D01, G02
8-318	PART (Partitioning of Treatment Sums of Squares)	D01, G02
8-319	RAND (Computation of Randon Fractions)	D01, G02
8-320	MMMS (Calculation of Minimum, Mean, Maximum and Standard Deviation)	D01, G02
8-321	REG-2 (Curvilinear Regression) REG-4 (Linear Regression)	D01, G02
8-322	CCMP (Correlation of Components) and CVAL (Computes Values of Principal Components)	D01, G02
8-323	CRC (Convert Peak Heights on an Auto-Analyzer Chart to PPM and Percentage)	D01, G02
8-324	TSP - Trend Surface Plotting	D01, G06
8-325	SBSM - Calculation of Duplicate Sub-Samples from Prinary Data	D01, G02
8-326	MLWI - Malawi Land Use Survey Analysis	D01, G02
8-327	CLAN (Cluster Analysis) and GRMN (Calculate Group Means)	D01, G02

NO.	TITLE	MEDIA/PRICE CODES
8-328	NNAN (Nearest Neighbor Analysis) - OREG (Orthogonalized Regression Analysis) - OREH (Additional Orthogonal Regression Coefficients)	D01, G02
8-329a	FOCARL, Version 14	A01, F02, H12, W00
8-330	TSS/8 ALGOL	A01, F06, W00
8-331	Roulette	D01, G02
8-332	The Civil War Game	D01, F02
8-333	8K PAL-D Assembler for 4K Disk Monitor System	A01, B07, F02, G06
8-334	KVEDIT	A01, B07, F02
8-335	COLPAC	A01, B13, F02, H12
8-336	DECtape Library System Modifications	A01, G06, H12, W00
8-338	BIN and CBL Loader	D01, F02, G02
8-339A	PST (Post Stimulus Time) and Latency Histogram for the LAB-8	A01, B07, F02, H12 } Same DECtape
8-339B	Time Interval Histogram Program	A01, B07, F02, H12 } Same DECtape
8-340	The Auto and Cross-Correlation Program for the LAB-8	A01, B12, F06, H12
8-341	LISP-8	A01, B07, F02, G06
8-342	STAP-8; Spike Train Analysis Program	A01, F06, W00
8-343	Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8	A01, W00
8-344	Toledo Extended Memory Binary Punch	D01, F02, G02
8-345	EDIT-PAL	D01, F02, G02
8-346	Pollution Game	D01, G06
8-347	DUBAVG	D01, G02
8-348	Mini Binary Punch	D01
8-349	Octal Debugging Technique with View	A01, B05, F02, G02
8-350	Wilcoxon-White Two Sample Rank Test	D01, F02, G02
8-351	ComBIN Loader	D01, F02, G02
8-352	Parity Hi-Lo Loader	D01, F02, G02
8-353	Disk Monitor Patch for BLACKJACK	D01, F02, G02
8-354	Pass 3 ASR 33 Format Overlay	D01, F02, G02
8-355	PAL III.75	D01, F02, G02
8-356	Page Printer	D01, F02, G02
8-357	ISOMER - Interactive Study of Organic Molecules by Educational Reinforcement	A01, B07, F02, G06

NO.	TITLE	MEDIA/PRICE CODES
8-358	Card Reader Patch	D01, G02
8-359	Hi-Q Game Playing Program	D01, F02
8-360	ASCII to Friden (EIA)	D01, F02
8-361	Game of Chance	D01
8-362	IOFMAG	D01, G02
8-363	DATOUT: A Simple Routine for Printing Sequential Data as an Array	D01, F02, G02
8-364	Extended Memory Patch to the 3-Word Floating Point Arithmetic Interpreter	D01, F02, G02
8-365	CARD	A01, B05, G06
8-366	Modified Readable Punch	A01, B05, F02, G02
8-367	Digital 8-12-U Modified	D01, G02
8-368	Tri-Data CartriFile PAL III Assembler	A01, B05, G08
8-369	Tri-Data CartriFile DEC Editor	D01, F02, G02
8-370A&B	FBUILD/DISK	A01, B07, G06
8-371	Teletype Control of ND 50/50 Memory Unit (TYPED)	D01, F02
8-372	ML Editor (Machine Language Editor)	D01, F02, G02
8-373	LISP Disk Array	D01
8-374	Binary or RIM Consolidator	A01, B05, F02, G06
8-375A	3 Page Floating Point Package	A01, B05, F02, G02
8-375B	3 Page Floating Point Package with Floating Output	A01, B05, F02, G02
8-376A	Field 1 Symbol Table Storage for PALD	D01, F02, G02
8-376B	PALD	D01, F02, G02
8-377	One Pass Assembler	A01, F02, W00
8-378	Map Directory Information on KV8/I	A01, B05, F02, G06
8-379a	Double Precision and Floating Point Interchanger	D01, F02, G06
8-380	WATSNU	D01, F02, G02
8-381	Cardreader Subroutine for Disk Editor	D01
8-382	Readable High Speed Punch Copier	D01, F02, G06
8-383A	Scan and Analysis Program	A01, F02, W00
8-383B	Core Display Program	A01, F02, W00
8-383C	Drawing Applications Program	A01, F02, W00
8-384	BLOK	D01, F02, G02
8-385	Mixed ASCII Formatting and Outputting Technique	D01

NO.	TITLE	MEDIA/PRICE CODES
8-386	Multiple Field Loader	D01
8-387	Grade Point Correlation	A01, F02, G06, W00
8-388	CALENDAR	A01, B05, F02, G06
8-389	Mini-Monitor, A Secondary Disk Monitor for the PDP-8	A01, B05, F02, G06
8-390	PALEDCO (PAL Assembler and Editor Combined)	D01, F02
8-391a	7 or 9-Track MTA for PS-8 with TC58/TU-20	D01, G02
8-392	Vector-8	A01, F06, H12, W00
8-393	Queing TCØ1/TU55 DECtape Routines	D01, H12
8-394	BASIC MOO	D01
8-395	Space War	A01, B07, F02, H12
8-396	MTS-6/70 (Millisecond Time-Sharing System)	A01, B07, F02, G06
8-397	8K Editor	A01, F01, W00
8-398	IMAGE	D01, F02, G02
8-399	8K FORTRAN Bit Manipulation Subroutines	A01, B05, F02, G02
8-400a	Execute Slow	D01, F02, G02
8-401	Dice Game and TIC-TAC-TOE	D01
8-402	Resequence	D01, G06
8-403	Stereo - A 2 Channel Music Program	A01, B07, F02, G06
8-404	Octal MEM Dump - Extended Memory	A01, F02, G02, W00
8-405	SOOT	A01, F02, G06
8-406	STATPAC Revisions for PDP-8/I and TSS/8	D01
8-407	Patch to Editor (DISK) DEC-D8-ESAD-PB	D01, F02, G02
8-408	Disk Utility Program	A01, B07, F06, G06
8-409	Card Loader	A01, B05, R19,
8-410	Pseudo-Random Number Generator, EAE Version	D01
8-411	Mongoose Display System	A01, B05, F02, G06
8-412	MRS X	A01, F02, G02, W00
8-413	GROPE III/A and BINLOC	A01, F02, G06, W00
8-414	LIST	D01, F02
8-415	Multiple Unit DECtape Copier	A01, B05, F02, G02
8-416b	Bibliographical Handling	A01, F06, G08, W00
8-417	XCORE	A01, H12, W00

NO.	TITLE	MEDIA/PRICE CODES
8-418A&B	VEKSEL and PAPT	D01, F02, G02
8-419	Nmr-Pulse for the Lab-8/I	A01, B07, F02, G06
8-420	LOGSIM-8	A01, F02, W00
8-421	Chain Load	A01, G02, W00
8-422	Binary Punch - Extended Memory II	D01, F02, G02
8-423	Disk Editor with View for LAB-8	A01, B05, F02, G06
8-424	Morse Code	D01, F02, G02
8-425	Block-Modify for PS/8	D01, F02, G02
8-426	Prime Number Generator	F01, W00, Y00
8-428A	EAE - Modification to DECUS NO. 8-143, FFTS-R	D01, F02, G02
8-428B	EAE - Modification to DECUS NO. 8-144, FFTS-C	D01, F02, G02
8-429	Intercorrelation 37	A01, B05, F02, G02
8-430	DECK: A Random Deck of Cards	D01, G02
8-431	8/I LAB Data System	A01, F06, W00
8-432	Triple Precision Integer Package	A01, G06, W00
8-433	Extensions to "LIBRA-FOCAL"	A01, B07, G06
8-434.1	SCAN	A01, B05, F02, G02
8-434.2	STD	A01, B05, F02, G02
8-434.3	CONV	A01, B05, F02, G02
8-434.4	TIC	A01, B07, F02, G02
8-434.5	TAB	A01, B05, F02, G02
8-434.6	HIST	A01, B07, F02, G06
8-434.7	TUNE	D01, F02, G02
8-435	RECOVER	A01, B05, F02, G06
8-436	EAE - Simulator	D01, F02, G02
8-437	Computer Dating Game	D01
8-438	DF-32/Sykes Swap	D01, F02, G02
8-439	MOVE	A01, F02, G02, W00
8-440	PIPL	A01, F02, G06, W00
8-441	DELETE	D01, F02, G02
8-442	"The BYU Boob Tube"	D01, G02
8-443	Keyboard Test Tape for Hot metal Linecaster with TTS	D01, F02, G02
8-444	COREMAP	A01, F02, G02, W00
8-445	FYLHLP - PS/8 File Utility Program	A01, B07, H12 *

* Same DECtape as 8-497A, 8-530, 8-531A&B, 8-677

NO.	TITLE	MEDIA/PRICE CODES
8-446	A Patch to FFTS-R for Use Without the EAE	D01, F02, G02
8-447	Roots of a Polynomial by Muller's Method	D01, G02
8-448	CORDMP - Formatted Octal Dump	D01, F02, G02
8-449A	A Magtape Handler for the PDP-8/TU20	D01, H12 — Same DECtape; (DECsystem-10 Format)
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program	D01, H12
8-449C	TALKlØ - A PDP-8/PDP-10 Utility-Loader	D01, H12
8-449D	Buffered I/O Subroutines for the PDP-8	D01, H12
8-450	PS/8 Editor With Display for KV8/I (Overlay)	A01, B05, F02, G06
8-451	PS/8 Handler for KV/8 Vector Display	A01, G02, W00
8-452	ANSAM (Analog Sampling)	D01, F02, G02
8-453	Rapid Alert Program (RAP)	A01, F02, G02, W00
8-454	Radio Teletype to ASCII	D01, F02, G02
8-455	CRTPAC	A01, B05, F02, G02
8-456A	PIP "AH"	A01, B12, F06, H12, J11*
8-456B	BUILD "AH"	A01, B12, F02, H12, J11*
8-457	DTFIX	A01, B05, F02, G02
8-458	VW - Field Independent I/O Handler for Disk and TTY	D01, F02, G02
8-459	TAYEX - Taylor Expansion Equation Solver	D01, F02, G02
8-460	TT89 - Tape Transfer PDP-8 to PDP-9	A01, F02, G08, W00
8-461	COPYlØ - PDP-10 DECtape Program for the PDP-8	A01, F02, G08, W00
8-462	INSTIN	D01, G02
8-463	Perpetual Calendar (BASIC Version)	D01, G02
8-464b	MTA: TRØ2 Magnetic Tape Handler	D01, F02, G02
8-465	The SKED Software System	A01, B12, F06, G10
8-466A	RL Monitor System (WCFMPG Version) P?S-08-1.1A	A01, W00
8-466B	RL Monitor Subsystems - P?S-08-1.1B	A01, W00
8-466C	Listing Utility Programs - P?S-08-1.1C	A01, W00
8-466D	RL Monitor System Utilities P?S-08-1.1D	A01, W00
8-466E	DECtape Utility Programs - P?S-08-1.1E	A01, W00
8-466F	PAL III Modified for RL Monitor	A01, W00
8-466G	POLY SNOBOL - P?S-08-1.1G	A01, W00

* 8-456A & 8-456B - Same DECtape, same linctape

NO.	TITLE	MEDIA/PRICE CODES
8-466H	POLY LISP - P?S-08-1.1H	A01, W00
8-466I	FOCAL Modified for RL Monitor	A01, W00
8-466UØ	Sources and systems for all the above programs, on an RL Monitor System DECtape, may be ordered under this number	A01, H12, W00
8-467a	BINREAD (Revised Version)	D01, F02
8-468	DIPDUB, A Dual-Independent Parameter, Double-Precision Pulse-Height Analysis Code	A01, B07, F02
8-469	Top Secret	D01, F02
8-470	ODT-11 (high) Modified*	A01, F02, W00
8-471	Verify Paper Tape (12K)	A01, F02
8-472	PS8IN, PS8OUT	A01, B05, G06
8-473	Three Utility Routines for PS/8 1. DTA and DECLAB 2. CHANGE and REMOVE 3. LIST	A01, H12, W00
8-474	EXIT PS/8	A01, H12, W00
8-475	PIPQ	A01, G06, W00
8-477	RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System	D01, F02, G02
8-479	PDP-8/E Instruction Simulators for other PDP-8s	A01, W00
8-480a	Two Subroutines for 8K FORTRAN 1. INPUT 2. RANDU and GAUSS	A01, F02, G02, W00
8-481a	MERGE	D01, F02
8-482	Patch to High ODT (DEC-08-COC2-PB)	D01, F02
8-483	GRFIT, A Simple Least Squares Routine	D01, F02, G02
8-484	RESTore for the RKØ8	D01, F02, G02
8-485	Geometric Data Truncation for Fourier Transform Programs	D01, F02, G02
8-486	SEGAR 7: A Seven Segment Array for Alphanumeric Character Generation	D01, F02, G02
8-487	Revised Octal Memory Dump	D01, F02, G02
8-488	NEWPAGE	D01, F02
8-489	SUBSET, Integer Compiler and Operating System	D01, F02
8-490	Tape Alteration Program	D01, F02, G06

* Tape A for KSR33 - Tape B for KSR35

NO.	TITLE	MEDIA/PRICE CODES
8-491	Indexed Floating Point Math Subroutines for PDP-8/E	A01, B07, G06
8-492	BINLOAD, BINTAPE and SEARCH	D01, F02, G02
8-493	Line to Block Conversion	D01, F02, G06
8-494	Translate Arabic Into Roman Numerals	D01, G02
8-495	CORRELATION ANALYSIS	A01, B05, F02, G06
8-496	UTR7: A 7-track Magnetic Tape Reading Utility	A01, B07, F02, G06
8-497A	8BAL - PDP-8 Macro Language	A01, H12, W00*
8-497B	8BAL Source Documentation	A01, W00
8-498	Unencoded Incremental Plotter Subroutine	A01, G02, W00
8-499	High-Speed Reader Patch for Lo-Speed Macro-8	D01, F02, G02
8-500	DUMP8	A01, F02, G02, H12, W00
8-501	Galactic Coordinates	D01, G02
8-502	Interrupt Duplicator for Binary Object Tapes	D01, F02
8-503	MACRO-8X: 8K Extended MACRO-8 Assembler	A01, F02, W00
8-504A	ESI (Engineering and Scientific Interpreter)	A01, F02, W00
8-504B	ESIX - Extended ESI	A01, F02, W00
8-504C	ESI Demonstration Programs	G02, W00, Y00
8-505	BIN - CBL Extended Memory Loader	D01, F02, G02
8-506	Load Areas	A01, B05, F02, G06
8-507	EEPP (Editor Even Parity Punch)	D01, F02, G02
8-508a	TSUTIL - A Utility-Diagnostic Program for TSS-8	A01, G06, W00
8-509	INTERRUPT - TEST	A01, B05, F05, G02
8-510	P8COR - Overlay for 8K PAL-D Assembler for 4K Disk Monitor System (DECUS NO. 8-333)	D01, F02, G02
8-511	FPAK-4 Interrupting Floating Point PACKAGE	A01, B07, F02
8-512a	Modified Binary Loader	D01, F02
8-513	DEBUG 8	D01, F02, G02
8-514	Alpha-Numeric Display Program	D01, G06
8-515	Program to Mate PAL III With Symbolic Editor	D01, F02
8-516	Self-Starting PS/8 Loader	A01, G02, W00

* Same DECtape as 8-445, 8-530, 8-531A&B, 8-677

NO.	TITLE	MEDIA/PRICE CODES
8-517	Bowling League Results, Standings and Averages Program	D01, H12
8-518	PS/8 FORTRAN Alphabetical Sort	D01
8-519	MACRO-8 Pass 3 Output Format Patch	D01, F02
8-520	PEST/WALD/PINIT: Adaptive Psychophysics Testing Package	D01, F02, G06
8-521	A Clock	D01, F02, G06
8-522	'PAGEIT'	D01, F02, G02
8-523	MDT - A Mini Debugging Technique	A01, F02, G02, W00
8-524	GRNDYE 1970 - A Program to Estimate Cardiac Output Off-Line from an Indicator Dilution Curve	A01, F02, G06, W00
8-525	DAFFT/PAFFT/DAQUAN (EAE)	A01, F06, G06, W00
8-526	PROCOL 10/71	A01, B07, F02
8-527	XDDT8E	A01, B07, F02
8-528	TIC-TAC-TOE: Modifications to TIC 5/8, DECUS NO. 8-173	D01, F02, G02
8-529	OSCAR: An Operating System for Computerized Animal Research	A01, F02, G06, W00
8-530	8BALIB - 8BAL Macro Library Generator	A01, H12, W00 *
8-531A&B	'TRIPLE' - 36 Bit PDP-8/E Simulator and 'TRIPLE' 8BAL Macros	D01, H12 *
8-532	OPDDT (One Page DDT)	D01, G02
8-533	"WHERE"	D01, F02
8-534	DUAL BINARY LOADER	D01, F02
8-535	BINARY PUNCH FOR PDP-8/E with 2 TTY's (or with high speed punch)	D01, F02
8-536	Advanced Averager Improvement	D01, F02, G02
8-537	Talking Eights	D01, F02, G06
8-538	Integer IOH for FORTRAN Library	D01, F02, G06
8-539	TD8E 4K Loader	D01, F02, G02
8-540A	BRAILLE-8	D01, G02
8-540B	BPRINT	D01, G02
8-541	Cassette Utility Program and PALC	A01, B07, F02, G06
8-542	Radioactive Decay	D01, F02, G02
8-543	TS8REV - Reverse Assembler for TSS/8	A01, F02, W00
8-544	CHECK and CHANGE-D	A01, F02, W00
8-545	PIF (Program Interrupt Facility for 3 TTY's	A01, F02, G02, W00

* On same DECtape as 8-445, 8-497A, 8-677

NO.	TITLE	MEDIA/PRICE CODES
8-546	DETEF - DECtape File-Handling System	A01, B12, F06, H12
8-547	Advanced Averager Program (Rotterdam Version)	A01, B07, F06, G08
8-548	Links to Page Routine	D01, F02, G02
8-549	Polynomial Least Squares Fit	A01, H12, W00
8-550	Modified Matrix Inversion - Real Numbers	D01, G02
8-551	COMBO	D01, F02, G02
8-552	Storage Display Device Handler	D01, G02
8-553	Big Brother II	A01, B07, F02, G06
8-554	ANOVA and DUNCAN	A01, G06, W00
8-555	MULTC Multiple Correlation Program	A01, G02, W00
8-556	CHISQ Chi Square Program	A01, G02, W00
8-557	CLUSTR Cluster Analysis Program	A01, G02, W00
8-558	CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program	A01, G06, W00
8-559	CUBIC - A Digital Program for On-Line Differentiation of Sample Analog Signals	A01, B07, F02
8-560	SAM-1	A01, F02, W00
8-561	Revised HELP Loader for High-Speed Reader and New BIN Loader	D01, F02
8-562	DISORT	A01, F02, G06, W00
8-563	TAPE	D01, F02, G02
8-564	A Statistical System in PS/8	A01, B07, G10
8-565	RENUM - Renumbering Program for BASIC Tapes	A01, B05, F02, G06
8-566	PARTL	D01, F02
8-567	EXPO	D01, F02
8-568	CFI - Continued Fraction Inversion	D01, F02
8-569	FLIT Assembler	A01, B07, F02, G08
8-570	BIN4SV	D01, F02, G02
8-571	INPUT, OS/8 Version	D01, F02, G02
8-572	Combination Lettering and Duplicator - Coder Program	D01, F02, G02
8-573	EDITS - A PS/8 Editor for Non-storage Scope Display	A01, H12, W00
8-574	TD8E System Handler for 8K PS/8	D01, F02
8-575	EAE Overlay for Four-Word Floating Point Package Multiply	D01, F02, G02
8-576	LOCAL PAL8: LPAL8.SV	D01, F02

NO.	TITLE	MEDIA/PRICE CODES
8-577a	Paper Tape Duplicator (P.D.T.)	D01, F02
8-578	Chromaticity Diagram	A01, F02, G06, W00
8-579	LISTIT	D01, F02
8-580	Decimal to Floating Point Conversion	D01, F02, G02
8-582	Random Number Generator Adapted for 8K FORTRAN/SABR	D01, F02, G02
8-583	BASOVR - 8K BASIC Overlay for PDP-8/S	D01, F02
8-584	PRECIS, A Program to Scan a Binary Tape	D01, F02, G02
8-586	XDIREC, OS/8-PS/8 Selective Directory Listing	A01, G06, W00
8-587	FORTRAN-D 4K Overlayings to Chain Programs	D01, F02, G06
8-588	PEEK, A User Program to Look at the TSS/8 Monitor	A01, G02, W00
8-589a	BOOTST, Universal OS/8 (PS/8) Bootstrap	D01, F02
8-590	Matrix Inversion	D01, F02, G02
8-591	Pulmonary Resistance	A01, B13, F06, G10
8-592	Printer Test Program	D01, F02, G02
8-593	Tri-Data Paper Tape PAL III Assembler	A01, B07, F02, G08
8-594	FP8 - Floating Point Arithmetic Software for DEC PDP-8 Series Computers	D01, F02, G06
8-595	UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length	A01, B07, F02, G06
8-596	Multilength Routines	D01, F02
8-597	N.I.H. OS/8 Package	A01, B12, H16
8-598	CRT: An OS/8 Handler for Tektronix 611 Storage Scope	D01, G02
8-599	DIBILD.; Directory Rebuilder for PS/8 or OS/8	A01, F02, G06, W00

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
5/8-1.1a	NC	$1.	$	$ NC	$	$	$	$	$	$	
5/8-2.1a	NC	1.		NC							
5-4	NC			NC							
5-5	NC			NC							
5/8-7	NC			NC							
5/8-9	NC	1.		NC							
5-10	NC	1.		NA							
5/8-14	NC	1.		NA							
5/8-15	NC	1.		NA							
5/8-18A	NC	1.		NC							
5/8-18C	NC	1.	5.	5.							
8-19a	NC	1.		5.							
5/8-20	NC	1.	5.	NC							
5/8-21	NC	1.	5.	NC							
5/8-23A	NC	1.		NC							
5/8-23B	NC	1.	5.	NC							
5-25	NC	1.		NC							
8-26A	NC	1.		NC							
8-26B.1	NC	1.		5.							
8-26C	NC	1.		NC							
8-26D	NC	1.		5.							
5/8-27	NC	1.		NC							
5/8-27a	NC	1.		NC							
5/8-28a	NC	1.		NA							
5-30	NC	1.		NA							
5-31a	NC	1.	5.	NA							
5/8-32a	NC	1.		NC							
5/8-33	NC		5.	NC							
5/8-35	NC		5.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
5-37	NC	$ 1.	$ 5.	$ NA	$	$	$	$	$	$	
5/8-38	NC	1.		NC							
5/8-39	NC	1.		NC							
5-41	NC	1.	5.	NA							
5/8-43	NC	1.	5.	NC							
8-44	NC	1.	5.	NC							
5/8-45	NC	1.	5.	NA							
8-46b	NC	1.		5.							
8-47	NC	1.	5.	NC							
5/8-48	NC	1.		NC							
8-49	NC	1.		NC							
5/8-51	NC	1.	5.	NC							
8-52	NC	1.	5.	NC							
5/8-54	NC	1.	5.	NC							
5/8-55	NC	1.	5.	NC							
8-56	NC	1.	5.	NC							
8-57	NC	1.	5.	5.							
8-58	NC		5.	NC							
8-60	NC		5.	NC							
8-61	NC		5.	NC							
8-64a	NC				15.	51.					On 3 DECtapes
8-65	NC	1.		NC							
8-66	NC	1.	5.	NC							
8-67	NC	1.	5.	NC							
8-68a	NC	1.		NC							
5/8-69	NC		5.	NC	5.	17.					On 1 DECtape
8-70	NC	1.	5.	NC							
8-71	NC	1.	5.	NC							
8-72	NC	1.	5.	NC							

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-73	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-74	NC	1.	5.	NC							
8-75	NC	1.	5.	NC							
8-77	NC	1.	5.	5.							
8-78	NC	1.	5.	5.							
8-79	NC	1.	5.	NC							
8-80	NC	1.	5.	NC							
8-81	NC	1.	5.	NC							
8-82	NC	1.	5.	5.							
5/8-83A&B	NC	1.	5.	NC							
8-84	NC	1.	5.	NC							
8-85	NC			NC							
8-87	NC	1.	5.	NC	5.	17.					On 1 DECtape
8-89	NC	1.	5.	5.							
8-90	NC		5.	NC							
8-91	NC	1.		5.							
8-92	NC	1.		NC							
8-93	NC		5.	NC							
8-94A	NC	1.	5.	NC							
8-94B	NC	1.	5.	NC							
8-95	NC	1.	5.	NC							
8-96	NC	1.	5.	NC							
8-97	NC		5.	NC							
8-98	NC	1.	5.	NA							
8-99A	NC	1.	5.	NC							
8-99B	NC	1.		NA							
8-100	NC		5.	NC							
8-102a	NC	1.		15.							
8-103A	NC	1.	5.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-103B	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-103C	NC	1.	5.	NC							
8-103D	NC	1.	5.	NC							
8-104	NC	1.	5.	NC							
8-105	NC	1.	5.	NC							
8-106	NC	1.	5.	NC							
8-107	NC	1.		5.							
8-108	NC	1.		5.							
8-109	NC	1.		5.							
8-110	NC	1.		5.							
8-111	NC	1.		5.							
8-112	NC	1.	5.	NC							
8-114a	NC	1.		NC							
8-115a	NC	1.	5.	NC							
8-117	NC			NC							
8-118	NC		5.	NC							
8-119	NC	1.	5.	5.							
8-120	NC	1.	5.	5.							
8-121	NC	1.	5.	NC							
8-122A	NC	1.		NA							
8-122B	NC	1.		NA							
8-123	NC			5.	5.	17.					Card Deck - $20.
8-124a	NC			5.	5.	17.					Card Deck - $20.
8-125	NC			NA							Card Deck - $20.
5/8-126	NC		5.	NC							
8-127	NC	1.		5.							
8-128	NC		5.	NC							
8-129	NC	1.	5.	NC							
8-130A	NC	1.	5.	NC							

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-130B	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-131	NC			NA							
8-132	NC	1.		NC							
8-133	NC	1.	5.	NC							
8-134	NC	1.	5.	NC							
8-135	NC	1.		5.							
8-136	NC		5.	NC							
8-137a	NC		1.*	NC	5.	17.					*Example Control Tape
8-141	NC	1.		5.							
8-142	NC	1.	5.	NC							
8-143	NC	1.		5.	5.	17.					On same (1) DECtape
8-144	NC	1.		5.	5.	17.					DECtape-PDP-10 Format
8-145	NC	1.		NC							
8-146	NC		5.	NC							
8-147	NC	1.	5.	NC							
8-148	NC	1.		NA							
8-149	NC	1.	5.	NC							
8-150	NC	1.		NC							
8-151	NC	1.	5.	NA							
8-152a	NC	1.	5.	NC							
8-153	NC			NC	10.	34.					On 2 DECtapes
8-154	NC	1.		5.							
8-155	NC	1.		NA							
8-156	NC	1.		NA							
8-157	NC	1.	5.	NC							
8-158	NC	1.	5.	NC							
8-159	NC	1.		NA							
8-160	NC	1.		NC							
8-161	NC	1.		5.							

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N/A - Not Available

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DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-162	NC	$ 1.	$	$ NA	$	$	$	$	$	$	
8-166	NC			NA							
8-167	NC	1.	5.	5.							
8-168	NC			NC	5.	17.	5.	15.			On 1 DECtape; LINCtape
8-169A	NC	1.	5.	NC							
8-169B	NC	1.	5.	NC							
8-169C	NC	1.	5.	NC							
8-169D	NC	1.	5.	NC							
8-169E	NC	1.	5.	NC							
8-169F	NC	1.	5.	NC							
8-169G	NC	1.	5.	NC							
8-169H	NC	1.	5.	NC							
8-169I	NC	1.	5.	NC							
8-169J	NC	1.	5.	NC							
8-169K	NC	1.	5.	NC							
8-170	NC	1.	5.	NC							
8-171	NC			5.							
8-172	NC	1.	5.	5.							
5/8-173	NC	1.		NA							
5/8-174	NC	1.		NA							
8-175	NC	1.		5.							
8-176	NC	1.	5.	NC							
8-177	NC	1.	5.	5.							
8-178	NC	1.	5.	5.							
8-179	NC	1.	5.	NC							
8-180	NC		5.	5.							
8-181	NC	1.	5.	5.							
8-182	NC	1.	5.	NC							
8-183	NC	1.		NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape
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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-184	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-185	NC	1.		NC							
8-186	NC	1.		NC							
8-187	NC	1.	5.	NC							
8-188	NC	1.		NC							
8-189	NC	1.		NA							
8-190	NC	1.		5.							
8-191	NC	1.		5.							
8-192	NC	1.		NA							
8-193	NC	1.	5.	NC							
8-194	NC	1.	5.	5.							
8-195	NC	1.		5.							
8-196	NC	1.		NC							
8-197	NC			NC							
8-198	NC	1.		5.							
8-199	NC		5.	NA							
8-200A	NC	1.		NC							
8-200B	NC	1.		NA							
8-201	NC	1.	5.	NC							
8-202	NC	1.	5.	5.							
8-203	NC	1.	5.	5.							
8-204a	NC	1.	5.	5.							
8-205	NC	1.	5.	5.							
8-206	NC	1.	5.	NA							
8-207	NC	1.	5.	NC							
8-208	NC			NC							
8-209	NC	1.		NA							
8-210	NC	1.		5.							
8-211	NC	1.		NA							

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N/A - Not Available

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-212b	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-213	NC	1.		NA	5.	17.					On 1 DECtape - 10 Format
8-214	NC	1.	5.	NC							
8-215	NC	1.		5.	5.	17.					On 1 DECtape
8-216	NC	1.	5.	NC							
8-217A	NC	1.	5.	NC							
8-217B	NC	1.	5.	NC							
8-217C	NC	1.	5.	NC							
8-218	NC	1.		NC							
8-219	NC	1.		NA							
8-220	NC	1.	5.	NC							
8-221	NC		5.	NC							
8-222	NC	1.		NC							
8-223	NC	1.	5.	5.							
8-224	NC	1.		NC							
8-225	NC	1.	5.	NC							
8-226	NC	1.	5.	NC							
8-227	NC	1.	5.	NC							
8-228	NC	1.	5.	NA							
8-229	NC	1.	5.	NC							
8-230	NC		5.	NC							
8-231	NC										
8-232	NC	1.	5.	NC							
8-233	NC	1.	5.	5.							
8-234	NC	1.	5.	NC							
8-235	NC	1.	5.	5.							
8-236	NC	1.	5.	NA							
8-237	NC	1.	5.	5.	5.	17.					On 1 DECtape - 10 Forma
8-238	NC	1.		5.							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape
D/S - DECUS Supplied Tape

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November 1972

DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-239	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-240	NC	1.	5.	NC							
8-241	NC	1.	5.	NC							
8-242	NC	1.	5.	NA							
8-243	NC	1.	5.	NC							
8-244	NC	1.	5.	NC							
8-245	NC	1.		NC							
8-246	NC		5.	NA							
8-247	NC	1.	5.	NC							
8-248	NC	1.	5.	NC							
8-249	NC	1.	5.	NC							
8-250	NC	1.	5.	5.							
8-251	NC	1.	5.	NC							
8-252	NC	1.	5.	NC							
8-253	NC	1.	5.	NC							
8-254	NC	1.	5.	NC							
8-255	NC	1.	5.	NA							
8-256	NC	1.	5.	NC							
8-257	NC	1.		NA							
8-258	NC	1.	5.	NA							
8-259	NC	1.	5.	NC							
8-260	NC	1.	5.	NC							
8-261	NC	1.	5.	NC							
8-262	NC			NC							
8-263	NC		5.	NC							
8-264	NC	1.	5.	NC							
8-265	NC	1.	5.	NC							
8-266	NC	1.		NC							
8-267	NC	1.	5.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-268	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-269	NC	1.	5.	5.							
8-270a	NC	1.	5.	5.							
8-271	NC	1.	5.	NC							
8-272	NC		5.	NC							
8-273	NC	1.		NC							
8-274	NC	1.		NC							
8-275	NC	1.		NC							
8-276	NC	1.	5.	NC							
5-277	NC	1.	5.	NC							
8-278	NC	1.	5.	NC							
8-279	NC		5.	NC							
8-280	NC	1.	5.	NC							
8-281a	NC	1.	5.	NC							
8-282	NC		5.	NC							
8-283	NC		5.	NC							
8-284	NC		5.	NC							
8-285	NC		5.	NC							
8-286	NC	1.	5.	NC							
8-287	NC	1.	5.	NC							
8-288	NC		5.	NC							
8-289	NC	1.		NC							
8-290	NC	1.	5.	NA							
8-291	NC	1.	5.	NC							
8-292	NC	1.	5.	5.							
8-293	NC	1.		5.							
8-294	NC	1.	5.	NC							
8-295	NC	1.	5.	NC							
8-296	NC	1.		NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-297	NC	$ 1.	$	$ 5.	$	$	$	$	$	$	
8-298	NC	1.	5.	5.							
8-299	NC	1.	5.	5.							
8-300	NC		5.	NC							
8-301	NC	1.		NC							
8-302	NC	1.		NC							
8-303	NC			NC							
8-304	NC	1.	5.	NC							
8-305	NC	1.	5.	NC							
8-306	NC		5.	NA							
8-308	NC	1.	5.	NC							
8-309	NC	1.	5.	NC							
8-310	NC			NC							
8-311	NC	1.	5.	NC							
8-312	NC	1.	5.	NC							
8-314	NC	1.	5.	5.							
8-315	NC	1.	5.	NC							
8-316	NC		5.	NC							
8-317	NC		5.	NC							
8-318	NC		5.	NC							
8-319	NC		5.	NC							
8-320	NC		5.	NC							
8-321	NC		5.	NC							
8-322	NC		5.	NC							
8-323	NC		5.	NC							
8-324	NC		5.	NC							
8-325	NC		5.	NC							
8-326	NC		5.	NC							
8-327	NC		5.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-328	NC	$	$ 5.	$ NC	$	$	$	$	$	$	
8-329a	NC	1.		NA	5.	17.					On 1 DECtape (obj,src)
8-330	NC	1.		NA							
8-331	NC		5.	NC							
8-332	NC	1.		NC							
8-333	NC	1.	5.	5.							
8-334	NC	1.		5.							
8-335	NC	1.		5.	5.	17.					On 1 DECtape - 10 Format
8-336	NC		5.	NA	5.	17.					On 1 DECtape
8-338	NC	1.	5.	NC							
8-339A	NC	1.		5.	5.	17.					On same (1) DECtape
8-339B	NC	1.		5.	5.	17.					DECtape - PDP-10 Format
8-340	NC	1.		5.	5.	17.					On 1 DECtape - 10 Format
8-341	NC	1.	5.	5.							
8-342	NC	1.		NA							
8-343	NC			NA							
8-344	NC	1.	5.	NC							
8-345	NC	1.	5.	NC							
8-346	NC		5.	NC							
8-347	NC		5.	NC							
8-348	NC			NC							
8-349	NC	1.	5.	5.							
8-350	NC	1.	5.	NC							
8-351	NC	1.	5.	NC							
8-352	NC	1.	5.	NC							
8-353	NC	1.	5.	NC							
8-354	NC	1.	5.	NC							
8-355	NC	1.	5.	NC							
8-356	NC	1.	5.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-357	NC	$1.	$ 5.	$ 5.	$	$	$	$	$	$	
8-358	NC		5.	NC							
8-359	NC	1.		NC							
8-360	NC	1.		NC							
8-361	NC			NC							
8-362	NC		5.	NC							
8-363	NC	1.	5.	NC							
8-364	NC	1.	5.	NC							
8-365	NC		5.	5.							
8-366	NC	1.	5.	5.							
8-367	NC		5.	NC							
8-368	NC		5.	5.							
8-369	NC	1.	5.	NC							
8-370A&B	NC		5.	5.							
8-371	NC	1.		NC							
8-372	NC	1.	5.	NC							
8-373	NC			NC							
8-374	NC	1.	5.	5.							
8-375A	NC	1.	5.	5.							
8-375B	NC	1.	5.	5.							
8-376A	NC	1.	5.	NC							
8-376B	NC	1.	5.	NC							
8-377	NC	1.		NA							
8-378	NC	1.	5.	5.							
8-379a	NC	1.	5.	NC							
8-380	NC	1.	5.	NC							
8-381	NC			NC							
8-382	NC	1.	5.	NC							
8-383A	NC	1.		NA							

N/C - No Charge
N/A - Not Available

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-383B	NC	$1.	$	$ NA	$	$	$	$	$	$	
8-383C	NC	1.		NA							
8-384	NC	1.	5.	NC							
8-385	NC			NC							
8-386	NC			NC							
8-387	NC	1.	5.	5.							
8-388	NC	1.	5.	5.							
8-389	NC	1.	5.	5.							
8-390	NC	1.		NA							
8-391a	NC		5.	NC							
8-392	NC	1.		NA	5.	17.					On 1 DECtape - 10 Format
8-393	NC			NC	5.	17.					On 1 DECtape
8-394	NC			NC							
8-395	NC	1.		5.	5.	17.					On 1 DECtape
8-396	NC	1.	5.	5.							
8-397	NC	1.		NA							
8-398a	NC	1.	5.	NC							
8-399	NC	1.	5.	5.							
8-400a	NC	1.	5.	NC							
8-401	NC			NC							
8-402	NC		5.	NC							
8-403	NC	1.	5.	5.							
8-404	NC	1.	5.	NA							
8-405	NC	1.	5.	NA							
8-406	NC			NC							
8-407	NC	1.	5.	NC							
8-408	NC	1.	5.	5.							
8-409	NC			5.							Cards - $20.
8-410	NC			NC							

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N/A - Not Available

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-411	NC	$1.	$5.	$ 5.	$	$	$	$	$	$	
8-412	NC	1.	5.	NA							
8-413	NC	1.	5.	NA							
8-414	NC	1.		NC							
8-415	NC	1.	5.	5.							
8-416b	NC	1.	5.	NA							
8-417	NC			NA	5.	17.					On 1 DECtape
8-418A	NC	1.	5.	NC							
8-418B	NC	1.	5.	NC							
8-419	NC	1.	5.	5.							
8-420	NC	1.		NA							
8-421	NC		5.	NA							
8-422	NC	1.	5.	NC							
8-423	NC	1.	5.	5.							
8-424	NC	1.	5.	NC							
8-425	NC	1.	5.	NC							
8-426	NA	1.		NA							
8-427b	NC			5.	5.	17.					
8-428A	NC	1.	5.	NC							
8-428B	NC	1.	5.	NC							
8-429	NC	1.	5.	5.							
8-430	NC		5.	NC							
8-431	NC	1.		NA							
8-432	NC		5.	NA							
8-433	NC		5.	5.							
8-434.1	NC	1.	5.	5.							
8-434.2	NC	1.	5.	5.							
8-434.3	NC	1.	5.	5.							
8-434.4	NC	1.	5.	5.							

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N/A - Not Available

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-434.5	NC	$1.	$ 5.	$ 5.	$	$	$	$	$	$	
8-434.6	NC	1.	5.	5.							
8-434.7	NC	1.	5.	NC							
8-435	NC	1.	5.	5.							
8-436	NC	1.	5.	NC							
8-437	NC			NC							
8-438	NC	1.	5.	NC							
8-439	NC	1.	5.	NA							
8-440	NC	1.	5.	NA							
8-441	NC	1.	5.	NC							
8-442	NC		5.	NC							
8-443	NC	1.	5.	NC							
8-444	NC	1.	5.	NA							
8-445	NC			5.	5.	17.					On 1 DECtape
8-446	NC	1.	5.	NC							
8-447	NC		5.	NC							
8-448	NC	1.	5.	NC							
8-449A	NC			NC	5.	17.					On 1 DECtape
8-449B	NC			NC	5.	17.					DECtape PDP-10 Format
8-449C	NC			NC	5.	17.					
8-449D	NC			NC	5.	17.					
8-450	NC	1.	5.	5.							
8-451	NC		5.	NA							
8-452	NC	1.	5.	NC							
8-453	NC	1.	5.	NA							
8-454	NC	1.	5.	NC							
8-455	NC	1.	5.	5.							
8-456A	NC	1.		5.	5.	17.					On 1 DECtape OR 1
8-456B	NC	1.		5.	5.	17.					LINCtape for OS/12 Use

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N/A - Not Available

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DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-457	NC	$ 1.	$ 5.	$ 5.	$	$	$	$	$	$	
8-458	NC	1.	5.	NC							
8-459	NC	1.	5.	NC							
8-460	NC	1.	5.	NA							
8-461	NC	1.	5.	NA							
8-462	NC		5.	NC							
8-463	NC		5.	NC							
8-464a	NC	1.	5.	NC							
8-465	NC	1.	10.	10.							
8-466A	NC			NA							
8-466B	NC			NA							
8-466C	NC			NA							
8-466D	NC			NA							
8-466E	NC			NA							
8-466F	NC			NA							
8-466G	NC			NA							
8-466H	NC			NA							
8-466I	NC			NA							
8-466UØ	NA			NA	5.	17.					On 1 DECtape
8-467a	NC	1.		NC							
8-468	NC	1.		5.							
8-469	NC	1.		NC							
8-470	NC	A-1.		NA							Tape A for KSR33
	NC	B-1.		NA							Tape B for KSR35
8-471	NC	1.		NA							
8-472	NC		5.	5.							
8-473	NC			NA	5.	17.					On 1 DECtape
8-474	NC			NA	5.	17.					On 1 DECtape
8-475	NC		5.	NA							

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N/A - Not Available

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DEC 7-(369)1112A-R1172

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-477	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-479	NC			NA							
8-480a	NC	.1.	5.	NA							
8-481a	NC	1.		NC							
8-482	NC	1.		NC							
8-483	NC	1.	5.	NC							
8-484	NC	1.	5.	NC							
8-485	NC	1.	5.	NC							
8-486	NC	1.	5.	NC							
8-487	NC	1.	5.	NC							
8-488	NC	1.		NC							
8-489	NC	1.		NC							
8-490	NC	1.	5.	NC							
8-491	NC		5.	5.							
8-492	NC	1.	5.	NC							
8-493	NC	1.	5.	NC							
8-494	NC		5.	NC							
8-495	NC	1.	5.	5.							
8-496	NC	1.	5.	5.							
8-497A	NC			NA	5.	17.					On 1 DECtape
8-497B	NC			NA							
8-498	NC		5.	NA							
8-499	NC	1.	5.	NC							
8-500	NC	1.	5.	NA	5.	17.					On 1 DECtape
8-501	NC		5.	NC							
8-502	NC	1.		NC							
8-503	NC	1.		NA							
8-504A	NC	1.		NA							

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-504B	NC	$ 1.	$	$ NA	$	$	$	$	$	$	
8-504C	NA		5.	NA							
8-505	NC	1.	5.	NC							
8-506	NC	1.	5.	5.							
8-507	NC	1.	5.	NC							
8-508a	NC		5.	NA							
8-509	NC	1.	5.	5.							
8-510	NC	1.	5.	NC							
8-511	NC	1.		5.							
8-512a	NC	1.		NC							
8-513	NC	1.	5.	NC							
8-514	NC		5.	NC							
8-515	NC	1.		NC							
8-516	NC		5.	NA							
8-517	NC			NC	5.	17.					On 1 DECtape
8-518	NC			NC							
8-519	NC	1.		NC							
8-520	NC	1.	5.	NC							
8-521	NC	1.	5.	NC							
8-522	NC	1.	5.	NC							
8-523	NC	1.	5.	NA							
8-524	NC	1.	5.	NA							
8-525	NC	1.	5.	NA							
8-526	NC	1.		5.							
8-527	NC	1.		5.							
8-528	NC	1.	5.	NC							
8-529	NC	1.	5.	NA							
8-530	NC			NA	5.	17.					On 1 DECtape
8-531A&B	NC			NC	5.	17.					Also includes 8-497, 445

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N/A - Not Available

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-532	NC	$	$ 5.	$ NC	$	$	$	$	$	$	
8-533	NC	1.		NC							
8-534	NC	1.		NC							
8-535	NC	1.		NC							
8-536	NC	1.	5.	NC							
8-537	NC	1.	5.	NC							
8-538	NC	1.	5.	NC							
8-539	NC	1.	5.	NC							
8-540A	NC		5.	NC							
8-540B	NC		5.	NC							
8-541	NC	1.	5.	5.							
8-542	NC	1.	5.	NC							
8-543	NC	1.		NA							
8-544	NC	1.		NA							
8-545	NC	1.	5.	NA							
8-546	NC	1.		25.	5.	17.					On 1 DECtape
8-547	NC	1.	5.	5.							
8-548	NC	1.	5.	NC							
8-549	NC			NA	5.	17.					On 1 DECtape
8-550	NC		5.	NC							
8-551	NC	1.	5.	NC							
8-552	NC		5.	NC							
8-553	NC	1.	5.	5.							
8-554	NC		5.	NA							
8-555	NC		5.	NA							
8-556	NC		5.	NA							
8-557	NC		5.	NA							
8-558	NC		5.	NA							

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-559	NC	$1.	$	$ 5.	$	$	$	$	$	$	
8-560	NC	1.		NA							
8-561	NC	1.		NC							
8-562	NC	1.	5.	NA							
8-563	NC	1.	5.	NC							
8-564	NC		10.	5.							
8-565	NC	1.		NC							
8-566	NC	1.		NC							
8-567	NC	1.		NC							
8-568	NC	1.		NC							
8-569	NC	1.	5.	5.							
8-570	NC	1.	5.	NC							
8-571	NC	1.	5.	NC							
8-572	NC	1.	5.	NC							
8-573	NC			NA	5.	17.					Image & ASCII DECtape
8-574	NC	1.		NC							
8-575	NC	1.	5.	NC							
8-576	NC	1.		NC							
8-577	NC	1.		NC							
8-578	NC	1.	5.	NA							
8-579	NC	1.		NC							
8-580	NC	1.	5.	NC							
8-582	NC	1.	5.	NC							
8-583	NC	1.		NC							
8-584	NC	1.	5.	NC							
8-585	NC	1.	5.	NC							
8-586	NC		5.	NA							
8-587	NC	1.	5.	NC							
8-588	NC		5.	NA							

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N/A - Not Available

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-589a	NC	$1.	$	$ NC	$	$	$	$	$	$	
8-590	NC	1.	5.	NC							
8-591	NC	1.	10.	10.							
8-592	NC	1.	5.	NC							
8-593	NC	1.	5.	5.							
8-594	NC	1.	5.	NC							
8-595	NC	1.	5.	5.							
8-596	NC	1.		NC							
8-597	NC			5.	10.	34.					1 obj. 1 src. DECtape
8-598	NC		5.	NC							
8-599	NC	1.	5.	NA							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

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All user DECtapes must be certified. DECUS cannot/will not copy programs onto uncertified tapes.

DECUS NO. 5/8-1.1a

BPAK - A Binary Input/Output Package for the PDP-5

P. T. Brady, Bell Laboratories, Holmdel, New Jersey

BPAK incorporates DEC's binary loader with a binary punch-out program. It is designed to fit on the last page of the PDP-8 memory, thus allowing memory-protected storage of a punchout program as well as a read-in program. It has been revised to allow reading into or punching out of any 4K field of memory; the previous version was limited to a 4K machine. BPAK reads and punches tapes in standard DEC binary format.

Source Language: PAL

DECUS NO. 5/8-2.1a

OPAK - An On-Line Debugging Program

P. T. Brady, Bell Laboratories, Holmdel, New Jersey

The new version of OPAK (octal package) is a revision of a debugging program originally conceived in 1964 by A. D. Hause of Bell Laboratories. OPAK enables the user to perform standard debugging operations with special emphasis on ease of typing and typing error correction. Debugging features include register examination and loading, block memory transfer, jamming sections of memory with any constant, an interpretive breakpoint with ability to execute it more than once before control returns to user, word search with mask, octal dump of blocks of memory, and a symbolic dump which recognizes seven groups of in/out devices (selected by user) and supplies the effective address of all indirect instructions and "AND" instructions.

DECUS NO. 5-3

Obsolete

DECUS NO. 5-4

Octal Typeout of Memory Area with Format Option

Donald V. Weaver, New York, New York

(Write-up consists of listing only)

DECUS NO. 5-5

Expanded Adding Machine

Donald V. Weaver, New York, New York

Expanded Adding Machine is a minimum-space version of Expensive Adding Machine (DEC-5-43-D) using a table look-up method including an error space facility. This is a basic version to which additional control functions can easily be added. Optional vertical or horizontal format, optional storage of intermediate result without reentry fixed-point output of results within reason, and other features that can be had in little additional space under switch register control.

DECUS NO. 5-6

Obsolete

DECUS NO. 5/8-7

Decimal to Binary Conversion by Radix Deflation and Accelerated Radix Deflation

Donald V. Weaver, New York, New York

These are typical programs by the improved method of regular and accelerated radix deflation.

DECUS NO. 5-8

Obsolete

DECUS NO. 5/8-9

Analysis of Variance - PDP-5/8

H. Burkhardt

An analysis of variance program for the standard PDP-5/8 configuration. The output consists of:

A. For each sample: 1) sample number, 2) sample size, 3) sample mean, 4) sample variance, 5) sample standard deviation.

B. The grand mean

C. Analysis of Variance Table: 1) the grand mean, 2) the weighted sum of squares of class means about the grand means, 3) the degrees of freedom between samples, 4) the variance between samples, 5) the pooled sum of squares of individual values about the means of their respective classes, 6) the degrees of freedom within samples, 7) the variance within samples, 8) the total sum of squares of deviations from the grand mean, 9) the degrees of freedom, 10) the total variance, 11) the ratio of the variance between samples to the variance with samples.

This is the standard analysis of variance table that can be used with the F test to determine the significance, if any, of the differences between sample means. The output is also useful as a first description of the data.

Other Programs Needed: Floating Point Interpretive Package (DEC-8-5-S)

DECUS NO. 5-10

Paper Tape Reader Tester

Tony Schaeffer, Lawrence Radiation Laboratory, Berkeley, California

A test tape can be produced and will be continously read as an endless tape. Five kinds of errors will be detected and printed out. The Read routine is in 6033-6040.

Storage Requirement: Locations 10, 11, 40-67 (save 63, 64), and 6000-7777.

DECUS NO. 5-11 through 5-13

Obsolete

DECUS NO. 5/8-14

Dice Game for the PDP-5/8

Edward Steinberger, Digital Equipment Corporation, Maynard, Massachusetts

Enables a user to play the game DICE on either the PDP-5 or PDP-8.

Storage Requirement: 1 to 1677
Source Language: PAL

DECUS NO. 5/8-15

ATEPO (Auto Test in Elementary Programming and Operation of a PDP-5/8 Computer)

Submitted by: Rutgers University, Electrical Engineering Department, New Brunswick, New Jersey

The program will type questions or instructions to be performed by the operator of a 4K PDP-5/8. The program will check to see if the operator has answered the questions correctly. If this is the case, it will type the next question or instruction.

DECUS NO. 5-16 and 5/8-17

Obsolete

DECUS NO. 5/8-18A

BIN Tape Disassembly Program for PDP-5/8

John W. McClure, University of California, Lawrence Radiation Laboratory, Livermore, California

Disassembles a PDP-5 or 8 program, which is on tape in BIN format. It prints the margin setting, address, octal contents, mnemonic interpretation (PAL) of the octal contents. A normal program or a program which uses Floating Point may be disassembled.

Minimum Hardware: 4K PDP-5/8, ASR33
Storage Requirement: $16\text{-}1377_8$

DECUS NO. 5/8-18B

Obsolete

DECUS NO. 5/8-18C

Disassembler with Symbols

Eberhard Werner, University of California, Marine Physical Laboratory of the Scripps Institution of Oceanography, San Diego, California

This disassembler accepts a binary tape of standard format and produces a listing of the tape in PAL III mnemonics, and a cross-reference table of all addresses referenced by any memory-reference instruction. A symbol table may be entered to produce a listing similar to a PAL III Pass 3 listing. A patch to produce only a cross reference table is included. See DECUS NO. 8-179.

Minimum Hardware: PDP-8 with 4K, ASR-33 High Speed Reader, EAE
Storage Requirement: $20\text{-}1773_8$ for program, $1774\text{-}7577_8$ for scratch
Source Language: PAL

DECUS NO. 8-19a

DDT-UP Octal-Symbolic Debugging Program

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts and Robb N. Russell, The Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania

DDT-UP is an octal-symbolic debugging program for a 4K PDP-8 which occupies locations 5600-7667. The mnemonics for the eight basic instructions are defined internal to this area. Other symbols are stored, four locations per symbol, from 5577 down towards 0000. The mnemonics for the standard OPR and IOT group instructions are initially defined in this area. Thus, the highest location initially available to the user is 5363. Beginning at this location the user may define symbols one at a time using the comma (,) operator.

From the Teletype, the user can symbolically examine and modify the contents of any memory location. DDT-UP allows the user to punch a corrected program in CBL format.

DDT-UP has a breakpoint facility to help the user run sections of his program. When this facility is used the debugger also uses location 0005.

Other Programs Needed: DECUS NO. 8-26A or DECUS NO. 8-26C

DECUS NO. 5/8-20

Remote Operated FORTRAN System

James Miller, Dow Badische, Freeport, Texas

Program modification and instructions to make the FORTRAN OTS version dated 2/12/65 operate from remote stations.

DECUS NO. 5/8-21

Triple Precision Arithmetic Package

Joseph A. Rodnite, Information Control System, Ann Arbor, Michigan

An arithmetic package to operate on 36-bit signed integers. The operations are add, subtract, multiply, divide, input conversion, and output conversion. The largest integer which may be represented is $2^{35}-1$ or 10 decimal digits. The routines simulate a 36-bit (3 word) accumulator in core locations 40, 41 and 42 and a 36-bit multiplier quotient register in core locations 43, 44 and 45. Aside from the few locations in page 0, the routines use less core storage space than the equivalent double precision routines.

DECUS NO. 5-22

Obsolete

DECUS NO. 5/8-23A

PDP-5/8 Oscilloscope Symbol Generator (4 x 6 Matrix)

Norman Weissman and John Kiraly, NASA-Ames, Moffett Field, California

The subroutine may be called to write a string of characters, a pair of characters, or a single character on an oscilloscope. Seventy (octal) symbols in ASCII Trimmed Code and four special "formal" commands are acceptable to this routine. The program is operated in a fashion similar to the DEC Teletype Output Package.

DECUS NO. 5/8-23B

PDP-5/8 Oscilloscope Symbol Generator (5 x 7 Matrix)

Larry T. Gell, Center for Visual Science, University of Rochester, Rochester, New York

This subroutine may be called to write a string of characters, a pair of characters, or a single character on a 34D Oscilloscope. Twenty-six alphabetic characters and 0-9 numeric characters are acceptable. However, there is space available to include any symbol the user desires. The program is operated in a fashion similar to the DEC Teletype Output Package (Digital 8-19-U).

Storage Requirement: 200_8-777_8 registers
Source Language: MACRO-8

DECUS NO. 5-24

Obsolete

DECUS NO. 5-25

A Pseudo Random Number Generator for the PDP-5 Computer

Paul T. Brady, Bell Laboratories, Holmdel, New Jersey

The random number generator subroutine, when called repeatedly, will return a sequence of 12-bit numbers which, though deterministic, appears to be drawn from a random sequence uniform over the interval 0000_8 to 7777_8. Successive numbers will be found statistically uncorrelated. The sequence will not repeat itself until it has been called over 4 billion times. (See DECUS NO. FOCAL8-1.)

DECUS NO. 8-26A

Compressed Binary Loader

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

The CBL (Compressed Binary Loader) format in contrast to BIN format utilizes all eight information channels of the tape, thus achieving nearly 25% in time savings.

As BIN tapes include only one checksum at the end of the tape, CBL tapes are divided into many independent blocks, each of which includes its own checksum. Each block has an initial loading address for the block and a word count of the number of words to be loaded.

Storage Requirement: 7700-7777

DECUS NO. 8-26B.1

BN2CBL and CBL2BN BIN to CBL Format Tape Converter

David M. Kristol, University of Pennsylvania, Philadelphia, Pennsylvania

CBL2BN is a short utility program which converts paper tape in CBL format to BIN and BN2CBL converts paper tape from BIN to CBL format. It offers high or low speed I/O and proper punching of field characters.

Storage Requirement: 300_8 and 200_8 Buffer; 400_8 and 200_8 Buffer
Source Language: PDPMAP - (DECUS NO. 8-166)

DECUS NO. 8-26C

Extended Compressed Binary Loader

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

XCBL is used to load binary tapes punched in CBL format into a PDP-8 with more than standard 4K memory. This loader occupies locations 7670 through 7777 of any memory field.

DECUS NO. 8-26D

XCBL Punch Program

Michael S. Wolfberg, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania

This program permits a user to prepare an XCBL tape of portions of a PDP-8 extended memory through the control of the keyboard of the on-line Teletype.

The program is loaded by the BIN Loader.

There are two versions of the program so that any section of memory may be punched: LOW XCBL occupies 00000-00377 and its starting address is 00000; HIGH XCBL occupies 17200-17577 and its starting address is 17200.

Source Language: PAL

DECUS NO. 5/8-27 and 5/8-27a

Bootstrap Loader and Absolute Memory Clear

J. E. Gorman, Western Electric Company, Princeton, New Jersey

Bootstrap Loader inserts a bootstrap loading program in page 0 from a minimum of toggled instructions.

Absolute Memory Clear leaves the machine in an absolutely clear state and, therefore, cycling around memory obeying an AND instruction with location zero. Should not be used unless one plans to reinsert the loader program.

DECUS NO. 5/8-28a

Phoenix Assembler - PAL III Modifications

Terrel L. Miedaner, Space Astronomy Laboratory, Madison, Wisconsin

This modification of the PAL III Assembler speeds up assembly on the ASR-33/35 and operates only with this I/O device. Operation is essentially the same as PAL III, except that an additional pass has been added, Pass 0. This pass, started in the usual manner, but with the switches set to zero, reads the symbolic tape into a core buffer area. Subsequent passes then read the tape image from storage instead of from the Teletype.

DECUS NO. 5/8-29

Obsolete

DECUS NO. 5-30

GENPLOT - General Plotting Subroutine

M. Adamowicz, Department of Electrical Engineering, New York University, New York City, New York

This self-contained subroutine is for the PDP-5 with a 4K memory and a CalComp incremental plotter. The subroutine can move (with the pen in the up position) to locations (x,y,), make an "x" at this location, draw a line from this present position to location (x,y) and initialize the plotter location counters.

DECUS NO. 5-31a

FORPLOT

Jerome Feder, Department of Electrical Engineering, New York University, New York City, New York

FORPLOT is a general-purpose plotting program for the PDP-5 computer in conjunction with the CalComp 560 Plotter. It is self-contained and occupies memory locations 0000_8 up to 4177_8. FORPLOT accepts decimal data inputted on paper tape in either fixed or floating point formats. Formats can be mixed at will. PDP-5 FORTRAN output tapes are acceptable directly and any comment on these are filtered out. An overlay has been added which allows it to be used by those who have neither a high speed reader nor a card reader.

Storage Requirement: $0000-4177_8$

DECUS NO. 5/8-32a

A Program to Relocate and Pack Programs in Binary Format

J. W. Bowman, Atomic Energy of Canada Ltd., Chalk River, Ontario, Canada

This program provides a means to shuffle machine language programs around in memory to make the most efficient use of computer store.

DECUS NO. 5/8-33

Tape to Memory Comparator

Milton Collins, Teradyne, Boston, Massachusetts

Tape to Memory Comparator is a debugging program which allows comparison of the computer memory with a binary tape. It is particularly useful for detecting reader problems, or during stages of debugging a new program. Presently uses high-speed reader, but may be modified for TTY reader.

DECUS NO. 5-34

Obsolete

DECUS NO. 5/8-35

BCD to Binary Conversion Subroutine and Binary to BCD Conversion Subroutine (Double Precision)

Selene H. C. Wise, Bermuda Press Ltd., Hamilton, Bermuda

This program consists of a pair of relatively simple and straightforward double precision conversions.

DECUS NO. 5-36

Obsolete

DECUS NO. 5-37

Transfer II

Paul Hammond, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts

For users who have more than one memory bank attached to the PDP-5/8, Transfer II may prove valuable in moving information from one field to another. When debugging, Transfer II enables a programmer to make a few changes in a new program and test it without reading in the original program again. Transfer II enables more extensive use of memory banks.

DECUS NO. 5/8-38

FType - Fractional Type

P. T. Brady, Bell Laboratories, Holmdel, New Jersey

Enables a user to type fractions of the form: .582, - .73, etc., which will be interpreted as sign plus 11 bits (e.g., $0.5=2000_8$). Subroutine reads into 300-3177 and is easily relocated, as it will work on any page without modifications.

DECUS NO. 5/8-39

DSdprint, DDtype - Double Precision Signed Decimal Input-Output

P. T. Brady, Bell Laboratories, Holmdel, New Jersey

DSdprint, when given a signed 24-bit integer, types a space or minus sign, and then a 7-digit decimal number in the range -8388608 to +8388607. DDtype enables a user to type in a signed decimal number in either single or double precision. These routines are already separately available, but the present subroutine package occupies only one menory page and allows for more efficient memory allocation. Located in 3000-3177, but will work on any page.

DECUS NO. 5-40

Obsolete

DECUS NO. 5-41

Break Point

Arthur R. Miller, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts

This debugging routine has been reduced to a minimum operation. It is a mobile routine which can operate around any program that leaves an extra 30 cells of memory space.

Its function is to insert break points in any given location of the program being debugged, and to hold the contents of AC and Link. The programmer may examine any locations desired and then continue to the next break point. It is presently located in 140_8 - 170_8, but may be easily relocated.

Storage Requirement: 140_8 - 170_8

DECUS NO. 5-42

Obsolete

DECUS NO. 5/8-43

Unsigned Octal - Decimal Fraction Conversion

Frank Ollie, Defence Research Telecommunications Establishment, Ottawa, Ontario, Canada

This routine accepts a four-digit octal fraction in the accumulator and prints it out as an N-digit decimal fraction where N=12 unless otherwise specified. After N digits, the fraction is truncated. Programs are included for use on the PDP-5 with Type 153 Automatic Multiply-Divide and the PDP-8 with Type 182 Extended Arithmetic Element.

Storage Requirement: 55_8 locations for the PDP-5; 47_8 locations for the PDP-8

DECUS NO. 8-44

Modifications to the Fixed Point Output in the PDP-8 Floating Point Package (Digital 8-5-S)

A. R. McKenzie, Data Systems Division, Standard Telephone & Cables, Ltd., England

This version of the Output Controller is in the form of patches to the Floating Output with an additional page of coding. It does not increase the size of the Floating Point Package. A summary of this version follows:

1. The number output is automatically rounded off to the last digit printed, or the sixth significant digit, whichever is reached first. Floating point output is rounded off to six significant figures since the seventh is usually meaningless.

2. A number less than one is printed with a zero preceding the decimal point (e.g., "+0.5" instead of "+.5").

3. A zero result, after rounding off, is printed as "+0" instead of "+".

4. The basic Floating Point Package includes the facility to specify a carriage return/line feed after the number using location 55 as a flag for this purpose. The patches for the Output Controller caused this facility to be lost. This version restores this facility.

DECUS NO. 5/8-45

PDP-5/8 Remote and Time Shared II System

James Miller, Dow Badische Chemical Company, Freeport, Texas

A time-shared programming system which allows remote stations immediate access to the computer and a wide selection of programs.

DECUS NO. 8-46b

The Utility Programs

Edward Della Torre, American-Standard, Princeton, New Jersey

Consists of seven programs (listed below) each of which may be selected via the Teletypewriter. When the program is started, either by a self-starting binary loader or by manually starting the computer in address 200_8, it is in its executive mode. In this mode, it will respond only to eight keys and perform the following functions:

B - go to BIN to QK Converter Program
E - go to Editor Program
F - FORTRAN Tape formatter
L - type a section of leader and stay in executive
N - go to Editor program without typing leader
P - go to Page Format Program
T - Assembly language tape formatter
Q - go to QK to BIN Converter Program

DECUS NO. 8-47

ALBIN - A PDP-8 Loader for Relocatable Binary Programs

J. L. Visschers, P. U. ten Kate and M. A. A. Sonnemans, Institut Voar Kernphysisch Onderzoek (IKO), Amsterdam, The Netherlands

ALBIN is a simple method for constructing relocatable binary formatted programs, using the PAL III Assembler. Allocation of these programs can be varied in units of one memory page (128_{10} registers). When loading an ALBIN program, the actual absolute addresses of indicated program elements (e.g., the keypoint of subroutines) are noted down in fixed program-specified location on page zero. In order to make a DEC symbolic program suitable for translation into its relocatable binary equivalent, minor changes are required which, however, do not influence the length of the program. Due to its similarity to the standard DEC BIN loader, the ALBIN loader is also able to read-in normal DEC binary tapes. ALBIN requires 122_{10} locations, RIM loader included. Piling-up in core memory of ALBIN programs stored on conventional or DECtape can be achieved using the same method with some modifications.

DECUS NO. 5/8-48

Modified Binary Loader MK IV

R. Ward, American-Standard Research Division, New Brunswick, New Jersey

The Mark IV Loader was developed to accomplish four objectives: 1) Incorporate the self-starting format described in DECUS NO. 5/8-27, Bootstrap Loader; 2) Select the reader in use, automatically, without switch register settings; 3) Enable a newly-prepared binary tape to be checked prior to loading by calculating the checksum; 4) Reduce the storage requirements for the loader so that a special program would fit on the last page of memory with it.

DECUS NO. 8-49

Relativistic Dynamics

G. Sharman, Southampton University, Southampton, England

Prints tables for relativistic particle collisions and decay in the same format as the Oxford Kinematic Tables. It can be used in two ways:

1. Two-particle Collisions - Given the masses of incident, target, and emitted particles, the incident energy and centre-of-mass angles, the program calculates angles and energies of the emitted particles in the Lab frame. If the process is forbidden energetically, program outputs "E" allowing the threshold energy to be found.

2. Single-Particle Decays - By specifying M2=0 (target), the problem will be treated as a decay, and similar tables to the above will be printed.

DECUS NO. 5/8-50

Obsolete

DECUS NO. 5/8-51

Character Packing and Unpacking Routine

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

ASCII characters may be packed two to a word and recovered. Control characters are also packable but are preceded by a 37 before being packed into the buffer.

Storage Requirement: 63_{10} words

DECUS NO. 8-52

Tiny Tape Editor

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This Tiny Tape Character Editor fits in core at the same time as the PAL III or MACRO-8 assemblers. A tape may be duplicated at three speeds and stopped at any character for insertion or deletion. The toggle switches control the speed and the functions desired.

Storage Requirement: 72_{10} registers

DECUS NO. 5/8-53

Obsolete

DECUS NO. 5/8-54

TIC-TAC-TOE Learning Program - T3

Michael Green, Stevens Institute of Technology, Hoboken, New Jersey

This program plays TIC-TAC-TOE basing its moves on stored

DECUS NO. 5/8-54 (Continued)

descriptions of previously lost games. The main program is written in FORTRAN. There is a short subroutine written in PAL II used to print out the TIC-TAC-TOE board. The program comes already educated with about 32 lost games stored.

Other Programs Needed: FORTRAN Object Time System

DECUS NO. 5/8-55

PALEX - An On-Line Debugging Program for the PDP-5 and PDP-8 Computers

Robert Berger, Bell Telephone Laboratories, New York, New York

One problem with programs written in Program Assembly Language (PAL) for operation on a PDP-5/8 computer is the danger of an untested program being self-destructive, running wild, destroying other programs residing in memory such as loading programs. PALEX prevents any of the above unwanted operations from occurring while it gives the operator-programmer valuable debugging information and enables him to make changes in his program and try out the modified program. Once running, PALEX connot be destroyed by any program or instruction in memory, the operator need not touch any manual console controls, and all required information is printed in easy-to-read format on the Teletype console.

DECUS NO. 8-56a

Fixed Point Trace No. 1

B. J. Biavati, Columbia University, New York, New York
Revised by: Bruce Bergeron, Attleboro High School, Attleboro, Massachusetts

A minimum size monitor program which executes the users' program one instruction at a time and reports the contents of the program counter, the octal instruction, the contents of the accumulator and link and the contents of the effective address by means of the ASR-33 Teletype. (See DECUS NO. 8-57)

Storage Requirement: 6400-6716

DECUS NO. 8-57

Fixed Point Trace No. 2

B. J. Biavati, Columbia University, New York, New York

Similar to Fixed Point Trace No. 1 (DECUS NO. 8-56) except that the symbolic tape provided has a single origin setting instruction of 6000. Any four consecutive memory pages can be used, with the exception of page zero, by changing this one instruction.

DECUS NO. 8-58

One-Page DECtape Routine

George Friedman, Massachusetts Institute of Technology, Cambridge, Massachusetts

A general-purpose program for reading, writing, and searching of magnetic tape. This program was written for the Type 552 Control. It has many advantages over both the standard DEC routines. The routines are one page long and can be operated with the interrupt on or off. The DEC program delays the calling program while waiting for the unit and movement delays to time-out. This routine returns control to the calling program. This saves 1/4 second every time the tape searches forward and half that time when it reverses. In addition, it will read and write block 0. This program is an advantage over the previous one-page routines in that it allows interrupt operations, does not overflow by one location, interprets the end zone correctly and not as an error, and provides a calling sequence identical to the DEC program.

DECUS NO. 8-59

Obsolete

DECUS NO. 8-60

Square Root Function by Subtraction Reduction (Uses EAE)

George Friedman, Massachusetts Institute of Technology, Cambridge, Massachusetts

A single precision square root routine using EAE. This routine is usually faster than the DEC routine and can easily be modified for double precision calculation at only twice the computation time.

DECUS NO 8-61

Improvement to Digital 8-9-F Square Root

George Friedman, Massachusetts Institute of Technology, Cambridge, Massachusetts

An improved version of the DEC Single Precision Square Root Routine (without EAE). Saves a few words of storage and execution is speeded up 12 percent.

DECUS NO. 8-62a and 5-63

Obsolete

DECUS NO. 8-64a

4K and 8K DECtape Programming System

James Crapuchettes, Stanford Electronics Laboratories, Stanford, California

This programming system is a complete revision and expansion of the DECtape Library System (written by DEC) and the DECtape Programming System (DECUS NO. 8-64). The System will allow editing, assembling and debugging of programs using one or more DECtape units (TU55) and 4K or 8K of memory on PDP-8 Family computers. The strong points of the

DECUS NO. 8-64a (Continued)
System are speed with DECtapes (much faster than Disk/DECtape Monitor System) and complete teletype control of all System programs. The file system is completely compatible with the System that it replaces (DECUS NO. 8-64), and all of the System programs except XEDIT, XPAL, XPAL8, XLOAD and XSYS are compatible with the old System. These 5 programs must be used with the new System only.

Note: TCØ1 version only. Tapes no longer available for 552 version.

Minimum Hardware: PDP-8, TCØ1(TCØ8), TU55(TU56), 1 DECtape unit required but 2 are preferable.
Source Language: PAL III

DECUS NO. 8-65

A Programmed Associative Multichannel Analyzer

G. C. Best, Atomic Energy Research Establishment, Harwell, England

The program describes the use of a small computer as an associative analyzer with special reference to the PDP-8. The advantages and limitations of the method are discussed in the write-up, and general program algorithms are presented.

DECUS NO. 8-66

Editor Modified for DECtape (552 Control)

Robin Wadleigh, Johns Hopkins University, Baltimore, Maryland

This program consists of modifications to the Digital 8-1-S Symbolic Editor to enable reading and writing on DECtape. This results in considerable time savings in assembling PAL programs since PAL has also been modified to accept the symbolic program directly from DECtape. The DECtape compatibility is also useful for storing text for later use and for regaining Editor memory space lost due to delete and change commands. In addition, the overflow detection routine is now foolproof and results in a HALT.

Minimum Hardware: PDP-8 with EAE, ASR-33, DECtape
Other Programs Needed: DECUS NO. 8-67
Storage Requirement: Editor: <Ø, 1502>
Modifications: <1462, 1502>
<6376, 7177>
DECtape Routines: <7200, 7577>

DECUS NO. 8-67

PAL Modified for DECtape Input (Uses EAE)

Robin B. Wadleigh, Johns Hopkins University, Baltimore, Maryland

This program is a modification to the Digital 8-3L-S PAL Assembly Program enabling PAL to obtain the symbolic program from DECtape (in addition to paper tape), and outputting the assembled program in the usual manner. (The symbolic program is written onto DECtape by use of the "Editor Modified for DECtape" Program.) This modification also makes it possible to assemble sections or commands from the keyboard with those from DECtape. The resulting assembly is limited in speed mainly by the punching of the assembled program during Pass 2; and Pass 1 is speeded considerably. Also included is a tabulator interpreter, providing Pass 3 listings in tabulated format.

Minimum Hardware: PDP-8 with EAE, ASR-33, DECtape (552)
Other Programs Needed: DECUS NO. 8-66
Storage Requirement: PAL III: <Ø, 3561> plus symbol table
Modifications: <6555, 7177>
DECtape Routines: <7200, 7577>

DECUS NO. 8-68a

LABEL Program

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

The LABEL Program punches labels for paper tapes on the Teletype punch. When a key on the Teletype keyboard is depressed, no echo is performed, but a few characters of tape are punched which form the outline of the character associated with the key. Outlines are punched for all characters whose code is between 240 and 337. (Reference DECUS NO. 8-106).

Storage Requirement: Locations 200-677 of any memory field. 400-677 of Readable Punch

DECUS NO. 5/8-69

LESQ29 and LESQ11

Michael W. King, Phillips Petroleum Company, Idaho Falls, Idaho

The purpose of the program is to fit the best sequences of parabolas to a given 400 point data curve in order to remove extraneous noise; rather than rely on a single 400 point parabola least squares fit to approximate a given data curve. Approximately 400 individual parabolas are computed as follows:

LESQ29 performs a second order least squares fit using a 29 point smooth interval.

LESQ11 is identical to LESQ29 except that an 11 rather than a 29 point smooth interval is used. LESQ11 will preserve higher frequency data than LESQ29 for a given data curve with constant time between data points.

Minimum Hardware: 4K PDP-5 or PDP-8, Teletypewriter (plotter, DECtape optional)
Other Programs Needed: Floating Point Interpretive Package (Digital 8-5-S) and appropriate data handling routines
Storage Requirement: LESQ11: 400-564; 700-716
LESQ29: 400-564; 700-751
Restrictions: Positive integer data $<3777_8$; time between data points constant

DECUS NO. 8-70

EAE Routines for FORTRAN Operating System (DEC-08-CFA3)

Russell B. Ham, U. S. Public Health Service, Winchester, Massachusetts

These are two binary patches to the FORTRAN Operating System which utilizes the Type 182 EAE hardware for single precision multiplication and normalization, replacing the software routines in FOSSIL (the operating system). The binary tape is loaded by the BIN Loader after FOSSIL has been loaded. Execution time of a Gauss-Jordan matrix inversion is reduced by approximately 30%.

Minimum Hardware: PDP-8 with Type 182 EAE
Other Programs Needed: FORTRAN Operating System DEC-08-CFA3-PB dated March 2, 1967

DECUS NO. 8-71

Perpetual Calendar

E. Singer, McGill University, Montreal, Quebec, Canada

The program is designed as a computer demonstration. When a valid date is fed into the computer, the corresponding day of the week is typed out. The program is based on the Gregorian Calendar and is limited to years between 1500 and 4095.

Minimum Hardware: PDP-8 with an ASR-33 Teletype
Storage Requirement: 20-1333

DECUS NO. 8-72

Matrix Inversion - Real Numbers

A. E. Sapego, Trinity College, Hartford, Connecticut

The program inverts a matrix, up to size 12 x 12, of real numbers. The algorithm used is the Gauss-Jordan method. A unit vector of appropriate size is generated internally at each stage. Following the Gauss sweep-out, the matrix is shifted in storage, another unit vector is generated and the calculation proceeds.

Other Programs Needed: FORTRAN Compiler and FORTRAN Operating System
Storage Requirement: Uses all of core not used by the FORTRAN Operating System

DECUS NO. 8-73

Matrix Inversion - Complex Numbers

A. E. Sapega, Trinity College, Hartford, Connecticut

The program inverts a matrix, up to size 6 x 6 of complex numbers. The algorithm used is the Gauss-Jordan method, programmed to carry out complex number calculations. A unit-vector of appropriate size is generated internally. Following the Gauss sweep-out, the matrix is shifted, another unit vector is generated, and the calculation proceeds.

Other Programs Needed: FORTRAN Compiler and FORTRAN Operating System
Storage Requirement: Uses essentially all core not used by the FORTRAN Operating System

DECUS NO. 8-74

Solution of System of Linear Equations: AX=B, by Inverting Matrix A, Then Multiplying the Inverse by Vector B

A. E. Sapega, Trinity College, Hartford, Connecticut

This program solves the set of linear algebraic equations AX= B by inverting matrix A using a Gauss-Jordan method. When the inverse matrix has been calculated, it is printed out. At that point, the program requests the B-vector entries. After read-in of the B-vector, the product is computed and printed out. The program then loops back to request another B-vector, allowing the system to solve many sets of B-vectors without the need to invert matrix A again. Maximum size is 8 x 8.

Other Programs Needed: FORTRAN Compiler and FORTRAN Operating System
Storage Requirement: Uses essentially all of core not used by the FORTRAN Operating System

DECUS NO. 8-75

Matrix Multiplication - Including Conforming Rectangular Matrices

A. E. Sapega and Chester Sic, Trinity College, Hartford, Connecticut

This program multiplies two matrices, not necessarily square but which conform for multiplication.

Other Programs Needed: FORTRAN Operating System and FORTRAN Compiler

DECUS NO. 8-76

Obsolete

DECUS NO. 8-77

PDP-8 Dual Process System

Richard M. Merrill, Digital Equipment Corporation, Maynard, Massachusetts

The purpose of this system is to expedite the programming of multiprocessing problems on the PDP-8 and PDP-8/S. It maximizes both the input speed and the portion of real time actually used for calculations by allowing the program to run during the intervals between issuing I/O commands and the raising of the device flag to signal completion of the command. The technique also allows queuing of input data or commands so that the user need not wait while his last line is being processed, and so that each line of input may be processed as fast as possible regardless of its length. The system uses the interrupt facilities and has less than 3% overhead on the PDP-8/S (about 0.1% on the PDP-8).

DECUS NO. 8-77 (Continued)

This method is especially useful for a slower machine where the problem may easily be calculation limited but would, without such a system, become I/O bound.

The program may also be easily extended to handle input from an A/D converter. Here, the input would be buffered by groups of readings terminated either arbitrarily in groups of N or by zero crossings.

This program can increase the I/O to computation efficiency of some programs by 100%. It can do this even for single Teletype. Each user will probably want to tailor the program to his individual needs.

Storage Requirement: 600_8 registers for two TTY's plus buffer space. (Several device configurations are possible.)

DECUS NO. 8-78

DIAGNOSE: A Versatile Trace Routine for PDP-8 and EAE

Keith B. Oldham, North American Aviation Science Center, Thousand Oaks, California

This relocatable trace routine will track down logical errors in a program (the "sick" program). Starting at any convenient location in the "sick" program, instructions are executed one at a time, and a record of all operations is printed out via the Teletype. To avoid tracing proven subroutines, an option is provided to omit subroutine tracing. The present routine is significantly more versatile than two other trace routines in the DECUS Library (DECUS NO. 8-56 and 8-57) for the PDP-8 in that it is able to trace "sick" programs containing floating point, extended arithmetic and a variety of input/output instructions. DIAGNOSE is, however, at a disadvantage compared with DECUS NO. 8-56 in requiring more memory space (five pages as opposed to two); and compared with DECUS NO. 8-57 in not possessing the trace-suppression features of the latter. The mode of operation of DIAGNOSE is quite different from the other trace routines.

Other Programs Needed: Floating Point Package needed for floating point tracing (DEC-8-5-S)

DECUS NO. 8-79

TIC-TAC-TOE (Trinity College)

Gunnar Walmet, Trinity College, Hartford, Connecticut

This TIC-TAC-TOE game is programmed, using internal logic, so that the computer will either win or stalemate, but not lose a game. At the termination of a game, the program restarts for the next game.

DECUS NO. 8-80

Determination of Real Eigenvalues of a Real Matrix

A. E. Sapega, Trinity College, Hartford, Connecticut

This is a two-part program for determining the real eigenvalues of a real-valued matrix. The matrix does not have to be symmetric. Part I uses the power method of iterating on an eigenvector to determine the largest eigenvalue of the matrix. Part II then deflates the matrix using the results of Part I so as to produce a matrix of order one less than that solved for in Part I. Part I can then be reloaded, and the next eigenvalue in line may be calculated. In this, all the real eigenvalues may be computed in order.

Minimum Hardware: PDP-8; ASR-33
Other Programs Needed: FORTRAN Systems
Source Language: FORTRAN

DECUS NO. 8-81

A BIN or RIM Format Data or Program Tape Generator

R. F. Templeman, The Physical Laboratories, The University, Manchester, England

This program enables a PDP-8 operator to generate tapes under Teletype control in RIM or PAL BIN format without formal assembly, assuming the operator knows the octal codes corresponding to each instruction. This is particularly useful when one is dealing with small programs for testing interface equipment or when making small modifications to larger programs saving reassembling time. Tapes generated using this program can be appended to existing BIN or RIM tapes and can then be loaded with the original tape into core with the appropriate loader. Another use of this program is in the preparation of data tapes in RIM or BIN format so that data can be loaded directly into PDP-8 core via the usual loaders. The program also generates leader/trailer code and a checksum under program control.

Storage Requirement: Locations 6000-6077
Source Language: PAL III

DECUS NO. 8-82

Library System for 580 Magnetic Tape (Preliminary Version)

G. Sharman, University of Southampton, Southampton, England

The system provides for storing program files (or other files) on the 580 Magnetic Tape with PDP-8, and recalling them at will without altering the state of the rest of the computer. In general principle, it is similar to the DECtape Library System, and the only effective storage requirement is the last page of memory.

As written, the system consists of three programs known as BOOTSTRAP 1, BOOTSTRAP 2, and the LIBRARY Routines.

DECUS NO. 5/8-83A&B

Octal Debugging Package (With and without Floating Point)

James Rothman

This program is an on-line debugger which will communicate with the operator through the ASR-33 Teletype. It allows register examination and modification, octal dumping, binary punching, multiple and simultaneous breakpoints, starting a program, and running at a particular location with preset AC and link. ODP is completely relocatable at the beginning of all pages except page zero, and is compatible with the PDP-5, the PDP-8 and the PDP-8/S.

Storage Requirement: The high version of ODP requires locations 7000-7577. The low version requires locations 0200-0777. All versions will require three pages. Also, location 0002 is used for a breakpoint pointer to ODP

DECUS NO. 8-84

One Pass PAL III

Krause and Riedl, Siemens, Erlangen, Germany

This is a modification to Digital 8-3L-S, for use on an 8K PDP-8 with ASR-33. The principle of the modification is to store the incoming characters during Pass 1 into the memory extension and taking them from there during Pass 2 and 3. Source programs must be limited to 4095 characters. This modification can save about 40% of assembly time.

Operation of the program is the same as for PAL III except that the reading of the source program for Pass 2 and 3 need not be repeated. For these passes, one simply presses CONTINUE after setting the correct switches.

Restrictions: The program does not work with high speed reader and punch

DECUS NO. 8-85

Set Memory Equal to Anything

Roy S. Taylor, Department of Defense, Fort George G. Meade, Maryland

This program will preset all locations to any desired settings, thus combining a memory clear, set memory equal to HALT, etc. into a single program. The program is loaded via the switch registers into core.

DECUS NO. 8-86

Obsolete

DECUS NO. 8-87

XMAP

Curtis Jansky and Robert Brown, Communications Systems, Inc., Paramus, New Jersey

This program types out the contents of the DECtape directory on TTY keyboard. The list includes the name of the program, its initial block number, the amount of blocks used, the starting address and the location(s) of the program in core. The above restriction is only a format restriction due to the line length on the TTY unit. At present, this program is operational only with the TCØ1 control; however, the symbolic version may be modified for use with the 552 control.

Storage Requirement: 0000-1232, 6000-6577 (directory)

Restrictions: Each program on tape is assumed to occupy no more than three successive sequences of memory pages

DECUS NO. 8-88

Obsolete

DECUS NO. 8-89

XOD - Extended Octal Debugging Program

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

XOD is an octal debugging program for a PDP-8 with extended memory which preserves the status of program interrupt system at breakpoint. The program occupies locations 6430 through 7577 of any memory field.

XOD includes an elaborate breakpoint facility to help the user run sections of his program. When this facility is used, the debugger also uses locations 0005, 0006 and 0007 of every memory field. (See DECUS NO. FOCAL8-2.)

Restrictions: The ability to punch binary tapes is not included in XOD

DECUS NO. 8-90

Histogram on Teletype Subroutine

J. B. Levin, University of Arizona, Tucson, Arizona

This routine plots histograms on the Teletype when there is no CRT display available or a means of making a permanent copy of a CRT display. Input to the routine consists of a vertical scaling factor, the size of the table to be plotted (limited only by the size of the Teletype print line), the starting address of two core areas: one containing the data to be plotted, and one for use as temporary storage by the machine.

Storage Requirement: 128_{10} words plus tables

Source Language: PAL III

DECUS NO. 8-91

MICRO-8: An On-Line Assembler

K. F. Kinsey, State University of New York, Geneseo, New York

M. E. Nordbert, Jr., Cornell University, Ithaca, New York

MICRO-8 is a short assembler program for the PDP-8 that translates typed mnemonic instructions into the appropriate binary code and places them in specified memory locations immediately ready to function. It processes the typed instructions by a table-lookup procedure.

It is especially useful for programs of less than one page which are to be run immediately. Only octal (not symbolic) addresses may be specified, but the user has control of the zero page and indirect addressing bits. An octal typeout routine permits examination of any memory location.

Storage Requirement: 3200 to 4200
Restrictions: MICRO-8 is quite capable of modifying itself

DECUS NO. 8-92

Analysis of Pulse-Height Analyzer Test Data with a Small Computer

E. McDaniel and J. W. Woody, Jr., Oak Ridge National Laboratory, Oak Ridge, Tennessee

This PDP-8 computer program is used in the evaluation of test data for multichannel pulse-height analyzers. The program determines integral and differential nonlinearities and examines smooth spectra of radioactive decay.

DECUS NO. 8-93

CHEW - Convert Any BCD to Binary, Double Precision

Louis O. Cropp, Sandia Corporation, Albuquerque, New Mexico

This subroutine converts a double precision (6-digit) unsigned-integral binary-coded decimal (BCD) number with bit values of 4, 2, 2 and 1 to its integral-positive-binary equivalent in two computer words. It is possible to change the bit values to any desired values and thereby convert any BCD number to binary.

Storage Requirement: 0109_{10}

DECUS NO. 8-94A

BLACKJACK

Dennis J. Frailey, Ford Motor Company, Dearborn, Michigan

This program enables a person to play BLACKJACK with the computer. The computer acts as dealer and keeps track of bets, cards played, etc.

Minimum Hardware: PDP-8 with EAE
Storage Requirement: $0\text{-}3777_8$

DECUS NO. 8-94B

BLACKJACK "Overlays"

Steven L. Bard, U. S. Army Nuclear Defense Laboratory, Edgewood Arsenal, Maryland

This patch contains two overlays for BLACKJACK (DECUS NO. 8-94A). The first eliminates the need for the EAE hardware, the second allows one to "double down" on any two cards with the instruction "D" (Ø response to "HIT?" is made invalid).

Minimum Hardware: PDP-8, 8/S or 8/I
Other Programs Needed: DECUS NO. 8-94A

DECUS NO. 8-95

TRACE for EAE

Eberhard Werner, Scripps Institution of Oceanography, University of California, San Diego, California

TRACE interpretively executes a PDP-8 program. At the same time a printout is provided of the contents of the program counter, the instruction, the link, accumulator, and multiplier-quotient registers, and where applicable the effective address and the contents of the effective address. This printout may be for all or a selected type of instruction within selected memory bounds. The program is capable of handling any PDP-8 instruction including IOT, two-word EAE, and interrupt instructions. TRACE cannot be destroyed by the program being traced while TRACE is in control.

Minimum Hardware: PDP-8 with Type 182 EAE, ASR-33 Teletype
Storage Requirement: 400_8 or 500_8 locations

DECUS NO. 8-96

J Bessel Function (FORTRAN)

J. A. Crawford, Communications Systems, Inc., Paramus, New Jersey

This program computes the J Bessel Function for a given argument and order. It is a complete PDP-8 FORTRAN program that operates in a conversational mode.

Other Programs Needed: FORTRAN Compiler/Operating System

DECUS NO. 8-97

GOOF

Peter Andrews and Charles Wagner, Fairchild R & D, Palo Alto, California

A one-page program which allows insertion of instruction (xxxx) in location (nnnn) by means of the TTY keyboard. A

DECUS NO. 8-97 (Continued)

feature of automatically incrementing the current address permits rapid insertion of blocks of data or instructions. Typing "RUB-OUT" reinitializes the program.

Storage Requirement: 175_8 locations (1 page)

DECUS NO. 8-98

3D Draw for 338 Display

Barry Wessler

This program is a demonstration of the capabilities of the 338 system. The program allows the user to sketch three dimensional objects on the scope and rotate them in real time.

Minimum Hardware: PDP-8 with 338 Display
Source Language: MACRO-8

DECUS NO. 8-99A

Kaleidoscope

The program creates pictures on the PDP-8 or PDP-8/S with 34D Display. They are varied by manipulating the sense switches (within the range 0000-0007). The program was submitted without comments by an anonymous donor.

DECUS NO. 8-99B

Kaleidoscope - 338 Display

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

The program creates varied pictures by manipulating the buttons of the 338 Display pushbutton bank.

Storage Requirement: $200_8 - 274_8$

DECUS NO. 8-100

Double Precision BCD Arithmetic Package (Incomplete)

Richard M. Merrill, Digital Equipment Corporation, Maynard, Massachusetts

Consists of the following routines:

BCDADD - The single precision BCD addition routine is the basic component of the BCD arithmetic package. This routine functions simply by masking out and adding together corresponding BCD digits (i.e., four bits) and checking for carry (i.e., when the sum of two four-bit numbers is greater than 9 (1001)).

MPYBCD - This routine multiplies a single precision (three digit) number times a double precision one to produce another double precision number. Overflow is indicated in the link; the arguments are not affected.

SUBBCD - One double precision BCD number is subtracted from a second by this routine. It uses a 9's complement routine and the double precision add routine.

DOLOUT - Special formats: ("$XXXX.YY "). ("XXXXXX "); (3 nonprinting data codes); ("XXX ").

DECUS NO. 8-101

Obsolete

DECUS NO. 8-102a

A LISP Interpreter for the PDP-8

Dr. G. van der Mey and Dr. W. L. van der Poel, Technical University of Delft, The Netherlands

LISP is a programming language for list manipulation. The system is particularly suitable for conversational use and teaching. There are very few restrictions to the language apart from the total storage space. More than half of the storage is used as list space. See also DECUS NO. 8-628 - LISP (modified) for PS/8, OS/8.

Minimum Hardware: 4K PDP-8 and ASR-33 High Speed Reader

DECUS NO. 8-103A

Four Word Floating Point Routines - Function Package

D. A. Dalby, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

This program package, written for use with Digital's Four Word Floating Point Package (DEC-08-FMHA-PB), includes subroutines to evaluate square, square root, sine cosine, arctangent, natural logarithm, and exponential functions.

DECUS NO. 8-103B

Four Word Floating Point Routines - Rudimentary Calculator

D. E. Wells, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

This is a minimum space program to perform calculations with the 10.5 decimal place precision of Digital's Four Word Floating Point Package (DEC-08-FMHA-PB), and uses the Four Word Floating Point Function Package (DECUS NO. 8-103A). Operations are performed in the sequence in which they are entered. One storage register is provided. Up to five user-defined operation routines may be called.

DECUS NO. 8-103C

Four Word Floating Point Output Controller with Rounding

C. K. Ross, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

This subprogram is almost identical to the output controller for the Three Word Floating Point Package (Digital 8-5-S) with the rounding addition (DECUS NO. 8-44) except that the Four Word Floating Point Package (DEC-08-FMHA-PB) is used.

DECUS NO. 8-103D

Additional Instructions for use with Four Word Floating Point Package

C. K. Ross, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

These subroutines allow the Four Word Floating Point Interpreter to perform the operations: read a floating point number, skip positive floating point accumulator, skip zero floating point accumulator, no operation, unconditional jump, negate floating point accumulator, and halt. The two skip instructions and the jump instruction allow forward or backward jumping up to 15 locations from the location of the instruction.

DECUS NO. 8-104

Card Reader Subroutine for the PDP-8 FORTRAN Compiler

Steven Sullivan, Oregon State University, Corvalis, Oregon

Modifications and additions which allow the PDP-8 FORTRAN Compiler to read source programs from cards. The standard FORTRAN card format is used with only minor modifications.

Minimum Hardware: 8K PDP-8 and a Type CR01-C Card Reader

Source Language: PAL III

DECUS NO. 8-105

D-BUG

F. K. Williamson, Solartron Electronic Group Ltd., Farnbrough, Hampshire, England

D-BUG is an aid used in debugging PDP-8 programs by facilitating communication with the program being run. Communication between operator and program is via the ASR-33 Teletype. D-BUG is similar to DEC's program ODT II (DEC-08-COA1-PB); however, it uses the DEC Floating Point Interpreter (Digital 8-5-S).

Two modes of operation are possible, fixed and floating point. D-BUG features include register examination and modification, control transfer, octal dumping and instruction trap-outs to D-BUG control. Registers containing floating point numbers may also be examined, and break-traps can be inserted in floating point programs.

Source Language: PAL

DECUS NO. 8-106

Readable Punch

A. M. Lane-Nott, Letchworth College of Technology, England

This program enables the user to type a character on the keyboard and produce the character in readable form on paper tape. The program uses the high speed punch. The readable characters on tape are produced by means of a table which contains the format of a 6 x 5 matrix using three words of storage per character to be punched. In addition, channel 8 is punched throughout. The program is terminated by typing a carriage return which generates 6 inches of tape. (Reference DECUS NO. 8-68a)

DECUS NO. 8-107

CHESSBOARD

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

This program displays a chessboard on the screen of a DEC 338 Display with all thirty-two chessmen set up on their initial board positions. There is no provision to move them about the board; it is just a demonstration picture.

Storage Requirement: $03000 - 04230_8$

DECUS NO. 8-108

Increment Mode Compiler (INCMOD)

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

The INCMOD program for the DEC 338 Display allows the user to build a display subroutine composed of increments only. The user inputs information by pointing with the light pen. The program displays the figure he is constructing in each of the four available scale settings. The program is of value as a demonstration and may be of help for maintenance purposes. It occupies locations 00000-01231 and builds the increment mode display file beginning at location 01232.

Storage Requirement: $0000-1231_8$

DECUS NO. 8-109

SEETXT Subroutine

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

SEETXT is a subroutine for the DEC 338 Display which can be called instead of the normal typeout subroutine. In addition to typing, it displays all printed characters on the screen corresponding to the last twenty lines which have been typed out.

The program includes the option of suppressing the typing so that output can occur at a much higher rate than ten characters per second. The user has the option of controlling the length of a delay loop in the subroutine so that output rate may range from nearly immediate to Teletype rate.

The maximum number of lines displayed, the scale, and intensity may be altered at any time. There is also the option of clearing the screen or displaying a blinking marker at the current typing position.

Source Language: PDPMAP Assembler

DECUS NO. 8-110

Directory Print (DIREC) for the DEC PDP-8 Disk System

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

This program lists an index of the file directory for the disk on the on-line Teletype. The user has the option of seeing the index to system files or user files, or both.

DIREC can also be used in conjunction with the SEETXT Subroutine for the 338 Display (DECUS NO. 8-109) to obtain a listing of the directory on the display screen.

Other Programs Needed: Disk Monitor System

DECUS NO. 8-111

DISKLOOK

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts

DISKLOOK is a small utility program for a PDP-8 with a 32K DF 32 Disk. Using the on-line Teletype, the user may examine and alter any location (in octal) on the disk. Masked searches are also available.

Storage Requirement: $200\text{-}777_8$

DECUS NO. 8-112

Sentence Generator

D. Dyment, Digital Equipment of Canada Ltd., Carleton Place, Ontario, Canada

This program generates random English language sentences, using a dictionary (provided by the user) of ten basic word groups (A-J). The dictionary is used in conjunction with a random number generator and a syntactical algorithm to provide an output of randomly constructed English language sentences.

The program is an excellent vehicle for computer demonstration purposes. It may also be used in English teaching programs to aid students in perceiving sentence structure and errors in the use of words.

DECUS NO. 8-113

Obsolete

DECUS NO. 8-114a

Decimal Output Routine for PDP-8 FORTRAN

G. R. Hervey, University of Leeds, England

The program loads over the PDP-8 FORTRAN Operating System (DEC-08-AFA3-PB) and provides output in conventional decimal form: rounded, aligned, and with plus sign, leading zeros (other than one, in the case of fractional numbers), and trailing decimal point replaced by spaces. The FORTRAN trigonometrical routines are over-written. The source program must begin with two statements assigning integer variables representing, respectively, the numbers of digits required to the right of the decimal point, and the total number of digits (these can be reassigned, by program or manually). Output is called in the normal way, i.e., by TYPE statements referring to FORMAT statements containing the symbol E. If output of a number is not possible in the format requested, the decimal point is shifted to the right in the field; if formatted output is still impossible, or if zero or negative total digits were requested, output reverts to "E" format.

Restrictions: FORTRAN source language programs must begin with two special statements defining format required

DECUS NO. 115a

Double Precision Interpretive Package

Roger E. Anderson, Lawrence Radiation Laboratory, Livermore, California

This program is similar in operation to the Floating Point Package (Digital 8-5-S). It consists of addition, subtraction, multiplication, division, load, store, jump and branch subroutines coupled to an interpreter. It allows direct and indirect addressing in the normal assembly language manner. The operation is faster and more compact than the collected individual double precision subroutines.

Minimum Hardware: PDP-8, 8/S, or 8/I
Storage Requirement: 14 words in page 0 and on additional 2 pages of memory

DECUS NO. 8-116

Obsolete

DECUS NO. 8-117

A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment

W. R. Burrus, E. Madden, C. O. McNew, and R. W. Peelle

Documentation (only) describing an interface constructed to use a PDP-8 computer with a charged-particle detector system employing three solid-state detectors and flight-time analysis. Up to 48 bits from each randomly-occurring event are transferred through the data (break) channel to a hardware-selected buffer region in the core of a PDP-8 computer. Designed for use as a magnetic tape analyzer for the most complex cases, the system assumes that the 48 bits originate in flag bits set by fast logic and in (presently four) amplitude digitizers, all of which are assumed to contain information for the same event. The system includes some limited capability for controlling the course of the experiment, and provides for read-out through the computer of a series of external fast counters. The report summarizes the design concepts, shows schematic flow diagrams, defines the computer instructions associated with the interface system, and gives simple model programs to illustrate methods of applications.

DECUS NO. 8-118

General Linear Regression

Ian E. Bush, Cybertek, Inc., Plainview, L. I., New York

The major section of this program is the "Main Arithmetic IX" which consists of four initializing statements; an input section; a weighting section; a section which cumulates means, sums of squares, etc.; a section which calculates the relevant regression coefficients, etc.; and a section which calculates confidence limits as variances.

The section which calculates the relevant regression coefficients allows for both cases of linear regression, and in the computation of standard error of the intercept, uses (N-2) degrees of freedom to provide a better estimate for small values of N while providing negligible differences from conventional calculation when N is larger.

The section which calculates confidence limits as variances provides a calculation of the variance of the error of the estimate of the dependent variable again using (N-2) degrees of freedom for the general case. This calculation is fully corrected for both random variance within the tested population of data and for the difference between the independent variable and the mean of the independent variable for the population of data.

DECUS NO. 8-119

Off-Line TIC-TAC-TOE Program for the PDP-8 Computer

Dave Hawkins, The Foxboro Company, Foxboro, Massachusetts

TIC-TAC-TOE is a self-learning program which will improve its game as it plays. Whenever its human opponent wins, the program changes its strategy such that it can never be beaten again in the same way. Thus, the program gains "experience" every time it loses. The program will punch its experience on paper tape in binary format on request. This experience tape can be reread by the program at any time and will reset the program to the level of experience it had when the tape was punched. The program will notify the operator if any error is made in reading the experience tape and gets very upset if the player tries to cheat.

Minimum Hardware:	PDP-8, ASR-33, or high speed reader and punch
Storage Requirement:	Locations 10-4000 (approximately) and will operate with low or high speed tape input/output equipment
Source Language:	PAL

DECUS NO. 8-120

Disk/DECtape FAILSAFE

Charles Conley, Digital Equipment Corporation, Maynard, Massachusetts

This program will punch the contents of the disk (or DECtape) onto paper tape which can be loaded back onto the disk using the same program. The paper tape is punched in 200_8 word blocks in binary format, with a checksum for each block. FAILSAFE simplifies and speeds the process of rebuilding the Disk System Monitor after running disk tests.

Minimum Hardware:	PDP-8, 8/S, 8/I, with 32K Disk or DECtape
Other Programs Needed:	PDP-8 Disk System Builder (DEC-Ø8-SBAB-PB)
Storage Requirement:	Ø-1177
Source Language:	PAL-D or MACRO-8

DECUS NO. 8-121

DECtape Handler

B. Eiben, Digital Equipment Corporation

This program allows quick, controlled data-block transfers between the PDP-8 and DECtape (552 control). It reads, writes and searches in minimum time (interrupt mode), requires minimum space (overlay with last page BIN, RIM, DECSYS Loaders) and occupies only two blocks on tape (block Ø = System, block 1 = Return-System). It is protected against destruction and gives, after the transfer, the status levels for testing purposes. It is usable as a Switch Register controlled program or as a subroutine with or without interrupt, giving the possibility of quick data storage, program shuffling and overlay technique with PDP-8 and DECtape.

DECUS NO. 8-122 A & B

SNAP (Simplified Numerical Analysis)

Developed at Harvard Medical School, Boston, Massachusett under an NIH grant

SNAP is a computer language for real-time interactive computation which can be learned in less than one hour. It is particularly useful in teaching programming to beginners.

A unique feature of SNAP is its ability to interact on-line with other laboratory instruments. SNAP can accept electical inputs directly and can read inputs from a real-time clock. Both of these functions are incorporated in a single SNAP instruction.

Another feature particularly useful for biological problems is Table Instructions. A list of 100 numbers may be entered from the keyboard or from punched paper tape.

When ordering tape, please state whether you wish SNAP without EAE, DECUS NO. 8-122A or SNAP with EAE, DECUS NO. 8-122B.

DECUS NO. 8-123

UNIDEC Assembler

C. Stephen Carr, University of Utah, Salt Lake City, Utah

The UNIDEC Assembler runs on the Univac 1108 and passes assembled PDP-8 code over the electronic link between the 1108 and PDP-8. The source statements are punched on

DECUS NO. 8-123 (Continued)

cards for input into the 1108 in a format nearly identical to that of MACRO-8. A printed listing and object code are produced as fast as the cards can be read.

DECUS NO 8-124a

PDP-8 Assembler for IBM 360/50 and above

V. Michael Powers, University of Michigan, Ann Arbor, Michigan

Modifications by Frank K. Bennett, Princeton University

The 360/PDP-8 Assembler is a collection of programs written mostly in FORTRAN IV (G) which operates on the IBM 360/50 and above. It assembles programs for PDP-5 and PDP-8 computers. Once a program has been assembled, it may be punched on cards, saved in a file, or transmitted through the Data Concentrator over data lines. It is also possible to obtain binary paper tapes by use of the Data Concentrator.

The Assembler follows the PAL III operation code and addressing conventions. The input format and program listing conventions are slightly different from those of PAL III, because it is organized around a line format, while PAL III is organized around a paper tape format.

Note: Certain routines called are on the Michigan Terminal System and are not included with the card deck.

DECUS NO. 8-125

PDP-8 Relocatable Assembler for IBM 360/50 and above

D. L. Mills and V. Michael Powers, University of Michigan, Ann Arbor, Michigan

The documentation available describes a method of segmenting PDP-8 programs for the purpose of facilitating program maintenance and residence in MTS (Michigan Terminal System) files. The method provides for program storage on a page-relocatable basis with relocation information contiguous to but not necessarily integral with text information. Linkages between separately assembled program segments are provided in a form very similar to those used in IBM System/360 systems.

Currently available utilities within MTS provides assembly and link-editing facilities, using programs stored either as punched card decks or in MTS files. Utilities are also included for the purpose of paper tape transcription either in PAL-compatible format or in a special format useful for dynamic loading via a data link to a remote machine. In addition to these MTS utilities, two relocating PDP-8 loaders are available which operate using the special dynamic-loading format. Each of these programs occupy one dedicated page of PDP-8 memory and operates in a multicore-bank environment. One of these programs is designed to operate as a stand-alone utility, while the other is designed to operate within the RAMP system.

DECUS NO. 5/8-126

Cumulative Gaussian Distribution Curve Fitting

Gerald E. Zajac
Submitted by: Howard A. Sholl, University of Connecticut, Storrs, Connecticut

This is a curve fitting program that will take a set of any number of points with any spacing describing a cumulative Gaussian distribution and determine the mean and standard deviation by an iterative least squares differential-correction technique. The mean square error of the final fitted curve is also computed.

Minimum Hardware:	4K PDP-8 with Teletype
Other Programs Needed:	FORTRAN Compiler and Operating System
Source Language:	PDP-5/8 FORTRAN

DECUS NO. 8-127

XDDT Extended Octal-Symbolic Debugging Program

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts and Robb N. Russell

XDDT, the result of merging the features of the DDT-UP (DECUS NO. 8-19a) and XOD (DECUS NO. 8-89), is an octal-symbolic debugging program for extended memory which preserves the status of the program interrupt system at breakpoints and includes many improvements over its predecessors.

From the Teletype, the user can symbolically examine and modify the contents of any memory location in a variety of formats. Positive and negative block searches with a mask may also be performed.

XDDT includes an elaborate single-breakpoint facility to help the user run sections of his program.

The ability to punch binary tapes is not included in XDDT.

Minimum Hardware:	8K PDP-8
Storage Requirement:	With initial symbol table, 4200-7577 of any memory field
Source Language:	PDPMAP (DECUS NO. 8-166)

DECUS NO. 8-128

PDP-8 Oscilloscope Display of Mathematical Functions

A. E. Sapega and S. G. Wellcome, Trinity College, Hartford, Connecticut

This is a general-purpose FORTRAN program for oscilloscope display of single-valued functions, $y = f(x)$. The FORTRAN statement of the function can be changed by the user so as to display specific functions of interest to the user. The user must specify a range for the independent variable. Scaling of the function for an appropriate display is carried out automatically by the program. The user may then interrupt the display to respecify the range of either independent or dependent variable. The display will be flicker free on a conventional (nonstore) oscilloscope.

DECUS NO. 8-128 (Continued)

Minimum Hardware: 4K PDP-8, Type 34D Display Unit
Other Programs Needed: FORTRAN Compiler and Operating System, PAL Assembler
Source Language: FORTRAN (main program), PAL (subroutine)

DECUS NO. 8-129

Magnetic Tape Program Library System

Donald C. Uber, Lawrence Radiation Laboratory, University of California, Livermore, California

Programs may be written on and called off IBM-compatible tape by name from the Teletype. BIN and RIM loaders may also be called in from the Teletype. Only the last page of core is used. Library programs may be corrected, modified, or added to at any time. When called in, programs may be relocated in core. It is possible to subdivide programs as they are written on tape and then individually relocate each portion as it is loaded in.

Minimum Hardware: 4K PDP-8, ASR-33, 57A Tape Control with transport
Storage Requirement: 7600-7777
Source Language: MACRO-8

DECUS NO. 8-130A

REBIL8 - Relocating Binary Loader

R. F. LaFontaine, CSIRO, Division of Mechanical Engineering, Victoria, Australia

Sections of the DEC-08-LBAA-LA Binary Loader have been rewritten to extend its duties to loading of suitably prepared relocatable binary program tapes as well as address and data modifications. Requirements are the same as the standard DEC loader, and REBIL8 will load standard DEC binary tapes.

Minimum Hardware: PDP-8/S and ASR-33
Source Language: MACRO-8

DECUS NO. 8-130B

RELCON - Binary to Relocatable Binary Tape Converter

R. F. LaFontaine, CSIRO, Division of Mechanical Engineering, Victoria, Australia

RELCON is used to tag data, used by memory reference instructions for indirect addressing, with the Data Modification Mark (376 Code). It may also be used to adjust addresses so that the relocatable version begins loading memory at page 0 if no address modification is specified. This does not mean that the program will operate in this area of memory but serves to simplify address specification at load time.

Minimum Hardware: PDP-8/S and ASR-33
Source Language: MACRO-8

DECUS NO. 8-131

SRCD, Software Rapid Character Display

David M. Kristol

SRCD (Software Rapid Character Display) is not a program but a method for quick display of a maximum number of text characters. A listing of increment-mode command words is supplied for the sixty-four characters on the Teletype keyboard. Each character is drawn within a 5 x 7 dot matrix followed by two blank points to provide spacing. It is mostly useful for displaying buffers of text, such as for editing programs or in utilization of the display as a satellite processor in time-sharing systems. In these applications, the PDP-8 is frequently sitting in a loop, "listening" for keyboard characters, or simply doing nothing. With SRCD, the main frame is constantly engaged in background work, helping to display characters, and I/O is handled by interrupt servicing routines.

Minimum Hardware: 4K PDP-8, 338 Display

DECUS NO. 8-132

STRIP, A Data Display and Analysis Program for the PDP-8, 8/I

John C. Alderman, Jr., Applied Data Research, Atlanta, Georgia

This program accepts paper tape data listings and displays the result on the display unit. Some elementary computations are made on the data and are also displayed. The program is deliberately designed to be open ended, and most users will want to add features peculiar to their own problem. Almost all functions are carried out in subroutine form, and these subroutines can be called either from the keyboard or within another subroutine.

DECUS NO. 8-133

First Order Kinetics

Kenneth B. Wiberg, Yale University, New Haven, Connecticut

First order kinetic processes are common in chemistry and in other areas. The program accepts up to 42 data points, calculates the rate constant and intercept by the method of least squares, and gives the rms deviation, the correlation coefficient, and an estimate of the error in slope. It permits graphical (CRT) examination of deviations from the least squares line and iteration to a "best" infinity value. It also provides options for plotting the deviation between observed and calculated quantities on a CRT and may be used in other cases in which one wishes to correlate the natural logarithm of one quantity with another, as in linear free energy relationships.

Storage Requirement: Occupies essentially all of core
Source Language: MACRO-8

DECUS NO. 8-134

LSQ (Least Squares Subroutine)

Kenneth B. Wiberg, Yale University, New Haven, Connecticut

The subroutine calculates the slope and intercept for the equation $y_i=mx_i+b$ by the method of least squares. It also returns the rms deviation of y, the correlation coefficient and an estimate of the error in the slope. The calculated values of y and the differences between the given and calculated values are also available on return from the subroutine.

Other Programs Needed:	FLOAT, floating point interpreter "C" -(Digital-08-YQYA); Loading Routine
Storage Requirement:	1.5 pages plus page 0 locations
Source Language:	MACRO-8

DECUS NO. 8-135

DNHELP, A Directory Assistor Program

David M. Kristol

DNHELP is a four-page disk utility program that may reside in core with DIREC (DECUS NO. 8-110) and DISKLOOK (DECUS NO. 8-111). It is designed to assist programmers in investigating the contents of the DN and SAM blocks on the disk under the DEC Disk Monitor System.

Minimum Hardware:	PDP-8 with DF-32 Disk, or TCØ1 DECtape
Other Programs Needed:	System Monitor Head (DEC Disk (Tape) Monitor System) and SYSIO
Storage Requirement:	5000-5777, Biffer from 7400-7577

Note: This program has also been combined with SYSLUK, DECUS NO. 8-141, in SYSHLP, DECUS NO. 8-198.

DECUS NO. 8-136

Fourier Transform Program

W. D. Strecker, Carnegie-Mellon University, Pittsburgh, Pennsylvania

The program, written in PDP-8 FORTRAN II, performs the discrete Fourier Transform of a function defined over N($N \leq 200$) evenly spaced points. I/O is via the ASR-33. The program requests the number of function points, then that number of function values, and then prints out the values of the sine and cosine components of the function at each defined harmonic. A conventional (not Cooley-Tukey) algorithm is used since I/O time relative to computing time is significant

DECUS NO. 8-137a

Programs for Storage, Manipulation and Calculation of Data Using DECtape

D. Eugene Hokanson, Veterans Administration Hospital, Seattle, Washington

These programs use DECtape for the storage of data files. Once data has been stored on DECtape, the statistical or calculation programs will operate on particular parts of it selected by the user. All programs are conversant. They ask questions regarding execution and accept answers via the Teletype.

DATRIT is a program to write data on DECtape directly from the ASR-33. Numerical data is stored on DECtape in floating point format.

EDATA is a program to edit data files created on DECtape by DATRIT.

SDT is a program to calculate Mean and Standard Deviation from data files stored on DECtape.

FORT calculates an analysis of variance table similar to DECUS NO. 5/8-9 using data files stored on DECtape.

COVAR calculates the necessary values for an analysis of covariance from data files stored on DECtape. The paired input consists of matching files of x and y data.

LCOVAR is a semi-logarithmic version of COVAR. y values are converted to log y before calculation so that each "Y" in the output format means log y. This program is useful for semi-logarithmic regression analysis.

TPAIR performs a paired T test on data files stored on DECtape. The input consists of paired files x and y data.

BCALC enables the user to do calculations using data files on DECtape as variables in the calculation. Results of calculation are stored on DECtape. BCALC is a master program for handling the data files. The user must supply a floating point program, which is called by BCALC as a subroutine, for each specific calculation.

LCALC enables the user to do calculations from data stored on DECtape using specific lines of a file as variables in the calculation. The result of the calculation may be stored on one line of the same file or a different file. LCALC is similar to BCALC.

SUBS is a package of four subroutines used by most of these programs. SUBS contains six pointers on page zero and subroutines in the area from 4000 to 7577.

These subroutines are: MESSAGE, Type packed text; UNFLOAT, Unfloat floating point numbers; RWTAPE, Read and write DECtape; FPOINT, Floating point output controller.

FLEX is an extended version of Floating Point which lacks the Output Controller. It is used to overlay the FPOINT section of SUBS in the program which use extended Floating Point.

DECUS NO. 8-137a (Continued)

Minimum Hardware: PDP-8, ASR-33, Two DECtape TU 55 Transports, EAE

NOTE: Binary and Source files for this program are on DECtape. The ASCII paper tape offered is an EXAMPLE CONTROL TAPE for Auto Processing.

DECUS NO. 8-138A, B & C

PAL III.5

James C. Kilbane, Belmont, Massachusetts

Withdrawn at the request of the author 2/16/72

DECUS NO. 8-139

Editor

James C. Kilbane, Belmont, Massachusetts

Withdrawn at the request of the author 2/16/72

DECUS NO. 8-140

Binary Tape Consolidator

James C. Kilbane, Belmont, Massachusetts

Withdrawn at the request of the author 2/16/72

DECUS NO. 8-141

SYSLUK

David M. Kristol

SYSLUK is a four-page utility program for examining and modifying blocks on the system I/O device, i.e., DF32 Disk or TCØ1 DECtape. Its operation is independent of which monitor head is resident, provided either is there. The user has the facility to examine and modify locations and to perform masked searches.

Minimum Hardware: 4K PDP-8 with DF32 Disk or TCØ1 DECtape
Other Programs Needed: SYSIO - "system device" routine for DEC Disk (Tape) Monitor System
Storage Requirement: 200-1177 (buffer from 7377-7577)
Source Language: MACRO-8

Note: This program has also been combined with DECUS NO. 8-135, DNHELP, in SYSHLP, DECUS NO. 8-198.

DECUS NO. 8-142

Binary Punch - Extended Memory

W. L. Lord, Argonne National Laboratory, Argonne, Illinois

This program is a revision of Digital 8-5-U Binary Punch which allows for extended memory. Tapes produced may be loaded by Digital 8-2-U Binary Loader.

Storage Requirement: 7600-7730
Source Language: MACRO-8

DECUS NO. 8-143

FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions

James E. Rothman

This subroutine computes the Fast Fourier Transform (FFT) or its inverse of a data sequence which has been stored in core. It will accommodate up to 2048 time samples and will transform that number in under 5 seconds.

Minimum Hardware: PDP-8 or 8/I with EAE
Storage Requirement: 3-7, 20-107, 400-6401
Source Language: PAL

Note: When ordering tape and/or listing please specify whether regular or AXØ8 version is required.

DECUS NO. 8-446 enables this program to be used on machines without EAE.

DECUS NO. 8-144

FFTS-C - Fast Fourier Transform Subroutine for Complex Data

James E. Rothman

FFTS-C enables computation of the Discrete Fourier Transformation in a minimum amount of time. By using the Cooley-Tukey algorithm, up to 1024 points may be transformed in only 4.5 seconds, introducing a reduction of 99 percent in computation time.

Minimum Hardware: PDP-8 or PDP-8/I with EAE
Storage Requirement: 3-7, 20-55, 400-5777
Source Language: PAL III

DECUS NO. 8-145

Time-of-Flight-Analyzer

H. J. Metzdorf, CCR- Euratom Ispra/Varese, Italy

This program enables the computer to interact with the TOF-converter and to generate spectrum displays on an oscilloscope. The TOF Converter provides the computer with digital information about the time a neutron takes to travel from the scattering sample to a detector (up to 12 detectors can be accommodated) and which detector was involved.

DECUS NO. 8-145 (Continued)

The TOF analyzer for which this program was written is in use with a double chopper facility installed at the ISPRA-1 reactor. It consists of a PDP-8 on-line computer with 4K memory, the automatic restart option, and a display unit; a TOF Converter; and conventional counting electronics.

Source Language: MACRO-8

DECUS NO. 8-146

High Speed Executive for the PDP-8, PDP-8/I

R. L. Steel, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

These routines are designed to handle the priority scheduling of up to 12 interruptable devices. Each I/O device is assigned a priority level, and upon receipt of an interrupt from that device, execution of its routine is initiated. If the priority of an I/O device "x" is less than that of an I/O device "y" which is currently being serviced, device "x" will be queued until "y" has been serviced. These routines allow a user to prohibit interrupts on any (or all) levels.

Minimum Hardware: PDP-8 with EAE
Storage Requirement: Three memory pages
Source Language: MACRO-8

DECUS NO. 8-147

Incremental Plotter Printout Subroutines

Michael P. Stryker and Phillip J. Best, University of Michigan, Ann Arbor, Michigan

A group of subroutines providing character-output facilities for the incremental plotter is presented as a package. Virtually all the ASCII characters may be printed in any of 8 formats and 63 sizes. One routine sets a control code to determine the size and orientation of the characters and the direction the line is to run, another prints out a string of characters according to this code, a third prints just one character held in AC 6-11, and a fourth routine prints the signed decimal equivalent of the contents of the accumulator.

Minimum Hardware: PDP-8, Type 350 Plotter and Control
Other Programs Needed: Digital 8-12-U "Incremental Plotter Subroutine"
Storage Requirement: Five memory pages (1177 locations)

DECUS NO. 8-148

Plotter System

Bruce J. Biavati, Computer Applications, Inc., New York, New York

This is a generalized plotting system for the CalComp Plotter allowing "plot time" modification on the data. The main program tape accepts all plotting commands and data from the Teletype. Patch tape #1 modifies the system to a high speed reader. Patch tape #2 modifies all input through the high speed reader.

Minimum Hardware: 4K PDP-8, CalComp Plotter and High Speed Reader
Source Language: MACRO-8

DECUS NO. 8-149

Core Window

Donald C. Uber, Lawrence Radiation Laboratory, University of California, Livermore, California

The 34D Scope displays the octal contents of any 64 consecutive core locations, beginning at the address set in the Switch Register and Data Field switches (if Extended Memory is used). There are 16 lines, each with an address plus four memory words. A special character generator program refreshes the display 11 times per second.

Minimum Hardware: PDP-8, 34D Scope
Storage Requirement: $15; 7240_8 - 7573_8$
Source Language: MACRO-8

DECUS NO. 8-150

PTOD8 High and PTOD8 Low

R. A. Gruenewald, Dr. Neher Laboratory, Netherlands Postal and Telecommunications Service, Leidschendam, Netherlands

PTOD8 (PTT Trace and Octal On-Line Debugging Program for the PDP-8), is a means to debug a running user's program. It features: register examination and modification, multiple breakpoints (traps), memory protection of a chosen block, word search (masked or not masked), tracing a running users program (gives a full printout of consequently executed instructions), is interrupt proof, and also features binary tape punching (automatic leader-trailer code and checksum).

Storage Requirement: PTOD8 requires 1343_8 registers
PTOD8 HIGH: $6200_8 - 7543_8$
PTOD8 LOW: $200_8 - 1543_8$

DECUS NO. 8-151

On-Line TIC-TAC-TOE

Richard B. Rothman, Groton School, Groton, Connecticut

This program plays the game of TIC-TAC-TOE with the user. By means of a previously stored algorithm, it selects the best move for any given situation. Conversation and ultimate defeat is via the Teletype.

Source Language: PAL

DECUS NO. 8-152a

PDP-8 Music Programs

R. G. Smith and D. J. Harrison, Carleton University, Ottawa, Canada

The coding program allows the user to type a song on the Teletype and produce a coded binary tape of that song. It accepts musical information in a form more compatible with ordinary sheet music and converts it to a coding scheme.

The playing program plays the song "Penny Lane" via the coding program with the use of a power amplifier and speaker.

A list of additional songs is available upon request.

Minimum Hardware: PDP-8 with D/A Converter, power amplifier and speaker
Restrictions: 6577_8 notes
Source Language: PAL III

DECUS NO. 8-153

Tape/Disk Transfer Programs

Daniel Parrish, Veterans Administration Hospital, Seattle, Washington

This series of programs was written to create and recall disk images on magnetic tape. They were written initially to facilitate rebuilding the disk system in the event of an accidental or deliberate wipeout. The usefulness of the DF-32 was significantly enhanced by the ability to store and easily recall a number of different disk images. A single reel of DECtape can hold up to five complete images, each of which occupies 400_8 blocks.

Minimum Hardware: PDP-8 with DF-32 Disk and TCØ1 DECtape
Other Programs Needed: Tape Read-Write Subroutine
Source Language: PAL III

DECUS NO. 8-154

SWAP

David M. Kristol

Using self-contained I/O, SWAP may be employed to load the disk from or dump the disk onto DECtape. It is faster and more versatile than the Disk to DECtape FAILSAFE.

Minimum Hardware: PDP-8 with DF-32 and TCØ1 DECtape or RS-08
Storage Requirement: $600_8 + 4200_8$ buffer
Source Language: PDPMAP (DECUS NO. 8-166)

DECUS NO. 8-155

HEP

Dr. A. K. Head, C.S.I.R.O., University of Melbourne, Parkville, Victoria, Australia

HEP is a program which gives calculating machine type operation and stored program operation. It is based on Floating Point Package (DEC-8-5-S-D) and Floating Point Controller (DECUS NO. 8-44). Calculations have an accuracy of just over six decimal digits and printout is rounded to six decimal digits. It includes facilities for format control, program control and tests, subroutines, and an array of variables. Although it was designed mainly for quick results from small calculations, it also has facilities and space for quite large and elaborate programs. Note, HEPTRACE, DECUS NO. 8-156.

Minimum Hardware: 4K PDP-8 with Teleprinter
Storage Requirement: $0003_8 - 7577_8$

DECUS NO. 8-156

HEPTRACE

A. K. Head, C.S.I.R.O., University of Melbourne, Parkville, Victoria, Australia

This program is used in conjunction with HEP (DECUS NO. 8-155) to give trace and one shot facility during the execution of HEP programs.

DECUS NO. 8-157

Square Root Patch

A. K. Head, C.S.I.R.O., University of Melbourne, Parkville, Victoria, Australia

This program is a patch to standard SQRT routine (DEC-8-5-S). It is a shorter and faster way of giving exact roots of exact squares.

Storage Requirement: $6656_8 - 6747_8$

DECUS NO. 8-158

AX-Ø8 Symbol Generator

D. Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Ontario, Canada

This subroutine may be called to display single characters or a string of characters on the oscilloscope of an AX-Ø8 (LAB-8) system. Sixty different symbols, in addition to four special "format" codes, are provided by the routine. Software control of character scaling and "margins" on the display is provided.

Minimum Hardware: LAB-8 with oscilloscope
Storage Requirement: 223_{10} locations
Source Language: PAL

DECUS NO. 8-159

CINET-BASIC

Bud Pembroke and David Gillette, Computer Instruction NETWORK, Salem, Oregon

This interpretive compiler was patterned after Dartmouth's BASIC. It was built by modifying DEC's FOCAL, and uses many of the same subroutines and/or methods. Error messages are given in terms of an error number and line number.

Minimum Hardware: PDP-8 with 4K and an ASR-33
Storage Requirement: Main program locations 0000-3252 and 4600-7600 and user's code from 3252 on.

DECUS NO. 8-160

FASTLOAD

D. Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Ontario, Canada

FASTLOAD is a minimal bootstrap loader for the PDP-8, requiring only eight instructions to load in the upper page of memory.

DECUS NO. 8-161

EXPO - A Flexible PDP-8 Data Acquisition Program

Bruce Arne Sherwood, California Institute of Technology, Pasadena, California

EXPO is a PDP-8 program which reads various kinds of data from experimental apparatus, optionally logs data on magnetic tape, and accumulates one-or two-dimensional histograms of selected variables. These histograms may be displayed on the Teletype or scope, simultaneously with data-acquisition. From the keyboard the user defines what variables are to be histogrammed and under what conditions; variable names are symbolic and numerical parameters are decimal. Also from the keyboard, the user may call for Teletype or scope output with some control of format. Because of its flexible user-oriented input-output, EXPO has proven to be very useful in debugging and utilizing complex apparatus in a high-energy physics experiment; it is likely to be useful in similar experimental situations in science or engineering. The write-up includes a useful general discussion of interrupt handling on the PDP-8.

Minimum Hardware: 4K PDP-8 with EAE, Magtape, Scope Display, and Plotter optional
Storage Requirement: 0-7177 if all options used

DECUS NO. 8-162

Demonstration Programs for the PDP-8

1. PDP-8 Music; 2. Night Watchman's Clock (338 Display); 3. World War I - Snoopy (338 Display); 4. Matching Pennies.

DECUS NO. 8-163 through 8-165

Obsolete

DECUS NO. 8-166

Interim Technical Report, The PDPMAP Assembly System

Michael S. Wolfberg, Massachusetts Computer Associates, Wakefield, Massachusetts and Thomas H. Johnson

This report describes the PDPMAP Assembly System which is used to assemble symbolic programs written for a PDP-8 or DEC-338 with up to 16K memory locations. The system is implemented at the University of Pennsylvania on an IBM 7040 and DEC PDP-8 connected by a high speed data channel (IBM 7904 and DEC DM03). The PDPMAP System uses the powerful assembler of a large computer (IBM 7040 MAP Assembler) to quickly assemble programs for a small computer.

Report only available.

DECUS NO. 8-167

CIRCUITS

D. Whiteley, International Computers, Ltd., Kidsgrove, Stoke-on-Trent, Staffordshire, United Kingdom

CIRCUITS is a program which enables Electronic Circuits to be drawn using the DEC-338 Display system. The complete circuit can be stored on paper tape and read in for future modifications.

Minimum Hardware: 8K PDP-8 with 338 Display, Teletype, High Speed Reader and Punch and character generator

DECUS NO. 8-168

CalComp Plotting Package

John W. Fitzgerald, Stanford Medical School, Stanford University, Stanford, California

This package is a series of subroutines designed to be used with the CalComp and PDP-8. The subroutines are: PLOTX - a modified 8-12-U, general move routine; ALPHA - alpha-numeric packed string plotting; DLTR - an 8-bit ASCII letter drawer; AXIS - an axis drawing routine; NUMBER - a signed 11-bit binary number output routine; DSYM - centered symbol drawing routine and LINE - vector plotting routine.

This package is issued only on DECtape and was compiled using the Fitzgerald Programming System which differs from DEC distributed programming systems. DECUS can offer no assistance in getting the program off the DECtape.

There is a LINCtape available for PDP-12 users.
Paper tape of PLOT routine only is available on special request.

DECUS NO. 8-168 (Continued)

Minimum Hardware: A PDP-8 computer with DECtape 350B Interface and CalComp Model 565 digital plotter with a step size of 0.01 inches.

DECUS NO. 8-169

Physical Oceanography Data Reduction Programs for the PDP-8

C. K. Ross, R. Reiniger and A. B. Grant
Submitted by: Joann E. Gavan, Department of Energy, Mines and Resources, Marine Sciences Branch, Dartmouth, Nova Scotia, Canada

This package presents an oceanographic data processing system for use at sea on a small computer with a basic configuration of 4K memory, ASR-33 Teletype, high speed paper tape reader/punch and a 31 inch CalComp Plotter. It is capable of accepting pressure, temperature, salinity, oxygen and silicate as measured parameters.

The following routines may be ordered as separate write-ups and tapes. Please specify whether you are ordering the complete or partial package:

A. Temperature Formatting
B. Pack Thermometer Calibration
C. Thermometer Correction
D. Pressure Curve Fit
E. Final Pass
F. PNUM
G. PLOPRM
H. Distance and Bearing
I. Formatting of Chemistry
J. Department PLOTCO
K. Additions to Floating Point Package

DECUS NO. 8-170

FORTRAN Source Conversion Program

Charles Conley
Submitted by: Richard Palmer, Digital Equipment Corporation, Maynard, Massachusetts

This program will allow the user to convert FORTRAN source programs written for DEC-08-AFC1 (FORTRAN Compiler, Old Version) to the new format, FORTRAN (DEC-08-AFC1-PB).

DECUS NO. 8-171

Real-Time System for Behavioral Science Experiments

Robert H. Tedford

This document describes a program which controls the operations of ten behavioral chambers using four classical experimental designs; Punishment Discrimination (PD), Nondiscriminated Avoidance (NDA), Fixed Ratio (FR), and Differential Rate of Low Response (DRL). Besides controlling the experiments, certain statistics are accumulated during the experiments for printout at the end of each test run.

Minimum Hardware: PDP-8 with an ASR-33, Requires a special interface between computer and behavioral equipment
Storage Requirement: 4K

DECUS NO. 8-172

Octal Systems Edit

Edward A. Taft III, St. Mark's School, Southboro, Massachusetts

Octal Systems Edit allows advanced users to perform direct octal editing of the information on their systems device. It makes block format compatible with system blocks. All editing is via the Teletype; commands allow reading, writing, and moving blocks; listing, changing, and punching individual words in a block.

Minimum Hardware: PDP-8, 8/I, 8/S with DF-32 or TCØ1/TU55
Other Programs Needed: Disk/DECtape monitor (DEC-D8-SBAC-PB)
Storage Requirement: 200_8-1177_8 (may be reassembled into any 4 pages)
Restrictions: Requires that Monitor Head be present in 7600_8-7777_8
Source Language: PAL-D

DECUS NO. 5/8-173

TIC 5/8

James A. Gillespie, Lawrence Radiation Laboratory, Berkeley, California

TIC 5/8 plays a master game of TIC-TAC-TOE on the display scope. The program can be reset to a learning configuration by hitting two keys on the Teletype, and will begin to learn winning strategies from each game it loses until it has become a master player again. The program makes use of the program interrupt facility and makes necessary changes for a PDP-5 or PDP-8.

Minimum Hardware: PDP-5/8 family and 34D scope
Storage Requirement: 1-3 and 41-3000
Restrictions: Should not be copied after use. Execution time excludes use on PDP-8/S. All program interrupt flags must be cleared for use (room is provided)
Source Language: LRL PDP Assembly Language

DECUS NO 5/8-174

MEDIUM

Lance A. Carnes
Submitted by: James A. Gillespie, Lawrence Radiation Laboratory, Berkeley, California

MEDIUM is a demonstration program for use on the PDP-5 or PDP-8 family. Messages typed on the Teletype are displayed on the scope, advancing across the screen from right to left similar to the Times Square News Sign.

Minimum Hardware:	PDP-5 or PDP-8 family with 34D or VC8/I Scope
Storage Requirement:	41_8-1500_8
Source Language:	LRL PDP-5 Assembly Language

DECUS NO. 8-175

Post Stimulus Interval Histogram for AX-Ø8

Peter Goldstern, Digital Equipment Corporation

This program, using the Schmitt triggers, generates a post stimulus interval histogram for one channel.

Minimum Hardware:	LAB-8
Other Programs Needed:	LAB-8 compiler
Restrictions:	Maximum count per interval is 4095_{10}. Maximum number of epochs is 4095_{10}. Maximum number of intervals is 3456_{10}

DECUS NO. 8-176

PAL CHOP

Edward A. Taft III, St. Mark's School, Southboro, Massachusetts

PAL CHOP produces minimum-length copies of PAL source tapes by removing all comments, tabs, multiple spaces, and multiple carriage-return/line-feeds. It is especially useful in facilitating the handling and storage of sections of extremely large programs which have been debugged.

Minimum Hardware:	PDP-8, 8/I, 8/L and ASR-33. High Speed Reader and Punch optional
Storage Requirement:	Program occupies 10_8-366_8; uses 400_8-1177_8 as buffer
Execution Time	I/O limited
Source Language:	PAL-D

DECUS NO. 8-177

COPY

Alexander Smythe
Submitted by: Theodore Green, Taft School, Waterbury, Connecticut

COPY is an extension of PIP. Its purpose is to copy disk files onto paper tape and vice-versa. COPY's major advantage is that it saves time in putting files on and off the disk. This can be very useful for those with one disk and limited space.

Minimum Hardware:	PDP-8, 8/I or 8/S with disk and Teletype
Other Programs Needed:	Disk Monitor I/O routine in core and command decoder stored on disk starting in block 15
Storage Requirement:	0-2777_8; only 0-1474_8 for program - rest buffers
Source Language:	PAL-D

DECUS NO. 8-178

Reverse Assembler

Henry G. duPont, St. George's School, Newport, Rhode Island

The Reverse Assembler accepts a paper tape in binary format and produces either a printed listing or a paper tape that is acceptable to the PAL Assembler as a symbolic tape. It produces the mnemonics for almost all input-output devices as well as PAL III and Floating Point instructions.

Minimum Hardware:	PDP-8 with ASR-33
Storage Requirement:	0-5400_8
Source Language:	PAL III

DECUS NO. 8-179

EAE Modifications for Binary Disassembler with Symbols

Alec Smythe
Submitted by: Theodore Green, The Taft School, Waterbury, Connecticut

This patch permits use of the Binary Disassembler with Symbols, (DECUS NO. 5/8-18C) by users without EAE. The patch shortens the space for the cross reference table by approximately one page, and changes all EAE instructions to JMS's to routines which take their place. The patch also changes the octal type routine to make space for links on page zero.

Minimum Hardware:	4K PDP-8, ASR-33, High Speed Reader
Other Programs Needed:	Binary Disassembler with Symbols (DECUS NO. 5/8-18C)

DECUS NO. 8-180

Editor and Assembler for 57A Magnetic Tape System (UCRL-50534)

Donald C. Uber, Lawrence Radiation Laboratory, Livermore, California

The Symbolic Editor and MACRO-8 Assembler have been modified to replace paper tape with IBM-compatible magnetic tape for more rapid and convenient program development.

The Editor reads and writes ASCII text in a file on magnetic tape. Text is stored in "pages" which may be individually accessed by Teletype commands. All the original operations are retained, including paper tape I/O.

MACRO-8 assembles the text file, completing all three passes before halting. Binary output is on high or low speed paper tape. The symbol table and Pass 3 listing may be on Teletype or written in a second tape file for listing on a line printer.

A third program moves pages of text from one area of tape to another whenever re-editing and reassembly are necessary.

Minimum Hardware:	PDP-8, 8K memory, ASR-33, 57A Magnetic Tape Control with one transport
Other Programs Needed:	Symbolic Editor (DEC-08-ESAB) High Speed MACRO-8 (DEC-8-8-S)
Storage Requirement:	Fields 0 and 1; locations 0-7577
Restrictions:	The 57A needs modification for Extended Memory operations
Source Language:	MACRO-8

DECUS NO. 8-181

Automatic Binary Loader and Duplicator-Coder for Auto Bin

Michael A. Robinton, National Semiconductor, Santa Clara, California

Automatic Binary Loader will automatically start tapes it has loaded into core in any memory field.

The Duplicator-Coder for Auto Bin computes checksums and notifies the operator of an error. It will select the correct input/output devices to be used. It can also be used to format the tapes for the Automatic Binary Loader.

Minimum Hardware:	Basic PDP-8
Storage Requirement:	Automatic Binary Loader 7600_8-7754_8; Duplicator-Coder for Auto Bin 0010_8 - 0431_8
Restrictions:	These programs will not load tapes formatted for automatic, memory extension control. (i.e., channel 8-punched); both programs will indicate a checksum error
Source Language:	PAL

DECUS NO. 8-182

Memory Compare

Ray H. Jones, Digital Equipment Company, Ltd., Reading, England

Memory Compare resides in page 36_8 of either field. It compares contents of similar addresses in pages 0-35_8 of both fields and outputs any differences detected.

Minimum Hardware:	PDP-8 with extended memory
Storage Requirement:	1 page
Source Language:	PAL-D

DECUS NO. 8-183

The WANG Loader

L. C. Wang
Submitted by: Richard E. Hummer, University of Maryland, College Park, Maryland

The WANG Loader will load any program that ends at location 7777. The program consists of 8 instructions that are loaded via the toggle switches, and a tape that will boot-in the BIN and RIM loaders.

Minimum Hardware:	PDP-8 with ASR-33

DECUS NO. 8-184

Page Routine

F. Weil, Automatic Control Engineering, Ltd., Kent, England

This program will arrange listings in page lengths and sequentially number the pages.

Minimum Hardware:	PDP-8 with ASR-33
Storage Requirement:	Approximately 200_8 words
Restrictions:	Maximum of 99 pages per listing
Source Language:	PAL III

DECUS NO. 8-185

Modifications to Symbolic Editor and Symbolic Tape Format Generator

G. R. Hervey, University of Leeds, The School of Medicine, Leeds, England

The modifications to Symbolic Editor (DEC-08-ESAB) are: 200_8 code becomes a valid character which can be stored or generated; T and F output 200_8 code; all three (3) punching commands, T, F and P, are followed by halts to enable the punch to be turned on; T also halts after punching trailer. These changes simplify editing of tapes which contain sections of text or data separated by lengths of leader/trailer.

The modified Format Generator produces a symbolic format which saves tape, editor buffer space and Teletype time.

Minimum Hardware:	PDP-8

DECUS NO. 8-185 (Continued)

Other Programs Needed: Symbolic Editor (DEC-08-ESAB) and Symbolic Tape Format Generator (Digital 8-21)
Source Language: PAL III

DECUS NO. 8-186

EAE FORTRAN Patch for the PDP-8

P. D. Siemens, Lawrence Radiation Laboratory, University of California, Livermore, California

This patch to the PDP-8 FORTRAN Operating System utilizes the extended arithmetic unit option (Type 182 EAE). Four arithmetic routines were rewritten-alignment, normalize, multiply and divide. The reduction in execution time is rather significant.

Another improvement besides the faster execution time was gained with EAE FORTRAN. Since the multiply routine calculates a full 48-bit product and rounds instead of truncates to 24-bits, an increase in significance of the product was noted.

These modifications work with the FORTRAN Operating System of March 2, 1967. They have not been tested with any other version, but would "probably" work. No changes must be made in operating procedure or any other portion of the program, as this modification loads the regular arithmetic subroutines.

Minimum Hardware: PDP-8 with Type 182 EAE
Other Programs Needed: FORTRAN Operating System (DEC-08-AFCO)
Source Language: FORTRAN

DECUS NO. 8-187

Keyboard Controlled Binary Punch

Edward A. Taft III, St. Mark's School, Southboro, Massachusetts

This program makes binary tape copies of selected areas of core. It is entirely keyboard controlled, and has provisions for punching leader, data, checksum and field marks for extended memory programming.

Minimum Hardware: PDP-8, High Speed Punch and Extended Memory (optional)
Storage Requirement: 1 page (versions included occupy 1, 36 and 37)
Source Language: PAL-D

DECUS NO. 8-188

Extended Memory Patch for 4 Word Floating Point Package (DEC-08-FMHA-8B)

Peter Goldstern, Digital Equipment Corporation

This patch will allow the DEC Floating Point Package to be entered from any memory bank if the arguments and operands processed by the Floating Point Routine all reside in the same memory bank that the package is called from. The patch only uses free locations within the package.

Other Programs Needed: Floating Point Package (DEC-08-FMHA-8B)

DECUS NO. 8-189

LKDN: Look Into the Directory Name Block

Barbara M. Rollman, Educational Testing Service, Princeton, New Jersey

LKDN will find the appropriate directory name entry when given a file name. It will decode and type out the contents of the entry. The output gives the disk location of the directory entry (in xxx.yyy form, see DISKLOOK, DECUS NO. 8-111) and, optionally, the disk block locations for each core page stored.

Minimum Hardware: PDP-8 with DF32 Disk
Other Programs Needed: Disk Operating System (DEC-08-SDAA)
Storage Requirement: Program - location 12_8 and 20_8 - 1377_8, Buffer - locations 1400_8 - 1777_8. If stored on disk, the program requires 6 blocks; it can be saved with the command "SAVE LKDN ! 0-1377;200"
Source Language: PAL-D

DECUS NO. 8-190

PATCH Utility Program

James A. McDonough, Concord Control, Boston, Massachusetts

This program, a utility routine, allows duplicating and updating of a DECtape file of any PDP-8 TCØ1 format. It is derived from a combination of ODT (DEC-08-COBO-D) and 4K and 8K DECtape Programming System (DECUS NO. 8 - 64a). The user should be familiar with the operation of both of these programs.

Minimum Hardware: PDP-8 with TCØ1 Control

DECUS NO. 8-191

Fields

D. Whiteley, International Computers Limited, Kidsgrove, Stoke-on-Trent, England

Fields, a demonstration program, calculates and displays the surface potential of a given boundary conditional plane. Each output facility is called by a 338 Display pushbutton giving a numerical and/or pictorial result.

Minimum Hardware: PDP-8 with High Speed Punch ASR-33 Teletype and 338 Display

DECUS NO. 8-191 (Continued)

Storage Requirement: 8K
Source Language: PAL III

DECUS NO. 8-192

T.A.L.C.:Taylor's Algebraic Linear Calculator
Bruce J. Taylor
Submitted by: Theodore Green, The Taft School, Waterbury, Connecticut

T.A.L.C. is a general-purpose calculator designed to evaluate a general algebraic equation, given all quantities involved in the equation. In effect, T.A.L.C. turns any of the family-of-eight computers into a powerful desk calculator capable of evaluating complex algebraic, trigonometric and logarithmic functions. In addition, it utilizes the concept of "idiot-proofing" to virtually eliminate the possibility of an operator error invalidating the equation. The program is easy to use and presents unlimited possibilities in any field where fast and accurate calculations are required.

Minimum Hardware: 4K PDP-8, High Speed Reader, DF32 Disk File and ASR-33/35
Other Programs Needed: Floating Point Package (Digital 8-5-S)
Storage Requirement: 4K
Source Language: PAL III

DECUS NO. 8-193

DISP

S. G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

DISP provides a simple means of using the 34D Display with FORTRAN-D. It allows the operator to display varying numbers of points with movable X and Y axes.

Minimum Hardware: 4K PDP-8 with DF32 Disk
Other Programs Needed: FORTRAN-D Compiler (DEC-08-AFCO)
Storage Requirement: $600\text{-}777_8$, $7400\text{-}7577_8$
Restrictions: Destroys FORTRAN-D disk read/write option (e.g., Read 3, 10)
Source Language: PAL-D

DECUS NO. 8-194

NMR Simulator

D. F. Juers, R. J. Boettcher, V. J. Hull and H. E. Zimmerman, University of Wisconsin, Madison, Wisconsin

NMR Simulator is designed to calculate the theoretical spectrum of compounds containing hydrogen, florine, carbon-13 and other nuclei of spin 1/2. The calculated theoretical spectrum is displayed on an oscilloscope.

Options for punched and typewritten output, change in X-axis offset (sweep offset) and spectrum resolution are available. Chemical shifts and coupling constant parameters may be varied successively until the displayed spectrum matches that obtained experimentally. Redisplay of a "library" of theoretical spectra is possible by retaining punched output tapes.

Minimum Hardware: 8K PDP-8 Oscilloscope and High Speed Reader/Punch
Storage Requirement: 8K
Execution Time: 1 second to 15 minutes
Source Language: PAL III

DECUS NO. 8-195

POLY BASIC

L. Elekman and Richard Lary, Digital Equipment Corporation

POLY BASIC is a compiler and operating stand-alone system designed for the PDP-8 family. It has a total user program storage of 32K characters in which the disk is utilized. Some of the features of the compiler are:

a. It has all BASIC system commands
b. It has all BASIC operations
c. It contains all built-in functions except TAN
d. Its accuracy is 1 part in 2^{23} rather than 1 part in 2^{35}, because of word size difference
e. Maximum program size is 6144 characters as in regular (Dartmouth) BASIC
f. Maximum usable statement number 4095 rather than 99999
g. Maximum array space is 3600 characters, and maximum number of statements is 330; however, these can be traded off against one another at the rate of 25 array elements per statement
h. There are no matrix operations
i. The argument "EDIT resequence" is implemented and the command "EDIT" renumbers the user file from line number 100 in steps of 10
j. There is a set of error messages to signal compilation errors and a set for execution errors

Minimum Hardware: PDP-8 with ASR-33 Teletype and DF32 Disk
Restrictions: Will not run on PDP-5 or PDP-8/S

DECUS NO. 8-196

DET - Detect Key Words

S. G. Cannon, UNIVAC, Salt Lake City, Utah

DET will detect a key word or words from any sentence that is typed via the Teletype. Other words in the sentence will not be affected so that any arrangement of words can be used.

A basic "conversation" type routine called "SPELL" is included to demonstrate the program operation.

DECUS NO. 8-197

Overlay for Standard Editor and PAL III Assembler

John Knox, International Controls Corporation, Houston, Texas

This overlay enables the user of Editor (DEC-08-ESAB) and PAL III Assembler (DEC-08-ASAC) to save approximately half the time required when using the ASR-33/35. This patch has proven to be a great time saver when debugging was necessary.

Minimum Hardware:	PDP-8 with 8K
Other Programs Needed:	Editor (DEC-08-ESAB) and PAL III (DEC-08-ASAC)

DECUS NO. 8-198

SYSHLP - Monitor System Utility Program

David M. Kristol

SYSHLP is a combined version of DNHELP (DECUS NO. 8-135) and SYSLUK (DECUS NO. 8-141). Besides more convenient alternation between the two programs, SYSHLP features improved search coding in the SYSLUK portion.

Minimum Hardware:	PDP-8 with DF32 or TCØ1
Other Programs Needed:	System Monitor Head (DEC-D8-SDAA)
Storage Requirement:	200_8 - 2177_8
Source Language:	PDPMAP (DECUS NO. 8-166)

DECUS NO. 8-199

Accessing Data Arrays and Teletype Input/Output

David G. Frutchey, Beckman Instruments, Inc., Fullerton, California

These two subroutines provide the user with a powerful, yet concise, programming methodology when used with the Floating Point Package (DEC-08-FMHA).

The array accessing subroutine permits the user to access both fixed and floating point data located anywhere in the first 2K words of core storage regardless of page overlap. Both data storage and retrieval can be performed on terms analogous to single variable, subscripted FORTRAN array terms such as "ARRAY (a*J+b)."

The second subroutine, TTY Text I/O, provides a concise facility for text output (63 characters), character input, line spacing and page tabulation.

Other Programs Needed:	Floating Point Package (DEC-08-FMHA)
Storage Requirement:	Array Accessing - 119_{10} words; Teletype Text I/O - 56_{10} words
Source Language:	PAL III

DECUS NO. 8-200A

BOSS

Dr. A. S. French

Submitted by: Dr. R. B. Stein, University of Alberta, Edmonton, Alberta, Canada

This disk version of BOSS allows a series of system programs to be brought into core and executed in either one or any number of runs without keyboard input, other than the initial listing of programs and a single decision input at the end of each run.

Minimum Hardware:	PDP-8 with DF32 Disk
Other Programs Needed:	Disk Monitor System (DEC-08-SDAA)
Storage Requirement:	Disk - 2 blocks
Restrictions:	File name must begin with a letter
Source Language:	PAL III

DECUS NO. 8-200B

DECtape Boss for PDP-8 Computers

A. S. French, University of Alberta, Edmonton, Canada

DECtape Boss is substantially different from the disk version (DECUS NO. 8-200A) although it operates on the same basic principles and appears identical to the user once it is loaded.

Minimum Hardware:	PDP-8 with DECtape
Other Programs Needed:	Disk Monitor System (DEC-08-SDAA)
Storage Requirement:	3 pages
Source Language:	PAL III

DECUS NO. 8-201

DECSW

Kenneth B. Wiberg, Yale University, New Haven, Connecticut

DECSW is a subroutine which accepts the contents of decimal switches at a remote location and converts the number into the following forms:

1. As an insert into a BCD string which may be typed out or displayed on CRT screen.

2. As a floating point number in the floating point accumulator.

3. As the binary equivalent in the accumulator, if the number was an integer.

Minimum Hardware:	PDP-8 with digital switches
Other Programs Needed:	Floating Point Interpreter
Source Language:	MACRO-8

DECUS NO. 8-202

PLOT

J. J. Spruit and L. R. Davila, Fels Research Institute, Yellow Springs, Ohio

PLOT will plot data points on a graph; calculate and plot a linear, least squares regression line and print out the coefficient of correlation, the equation of the regression line and other pertinent parameters.

Minimum Hardware:	4K PDP-8 with a Houston Instrument Complot Plotter Model 6650, DP-1-1 or equivalent
Other Programs Needed:	Floating Point Package (Digital 8-5C-S), ALPHA (DECUS NO. 8-203), requiring extended memory if used
Storage Requirement:	Page Ø, 200-2453, 4650-4751
Restrictions:	Maximum number of data points is 190

DECUS NO. 8-203

ALPHA

J. J. Spruit and L. R. Davila, Fels Research Institute, Yellow Springs, Ohio

ALPHA is used for titling graphs on the plotter. It can be used in conjunction with PLOT (DECUS NO. 8-202).

Minimum Hardware:	PDP-8 with 8K memory and a Houston Instrument Complot Plotter Model 6650, DP-1-1 or equivalent
Storage Requirement:	Page Ø, 200-4374
Restrictions:	When used in conjunction with PLOT (DECUS NO. 8-202) extended memory is required

DECUS NO. 8-204a

PATCH - A PDP-8 Binary Paper Tape Patch Program

Charles McComas, Digital Equipment Corporation, Maynard, Massachusetts

PATCH provides a simple, convenient means for making changes to PDP-8 binary format paper tapes, and for creating short binary tapes. Single binary tapes may be patched or merely copied. Several tapes may be combined, with or without changes being made. Additions to tapes may be created. Whole pages of code may be moved or deleted. In certain cases binary words may be inserted within existing binary data. Field expressions may be inserted, changed or deleted.

Changes and creations are made via the Teletype keyboard using simple commands. Data is typed in octal.

NOTE: The DECtape available for this program is in PDP-10 format.

Minimum Hardware:	4K PDP-8, Teletype, or high speed reader/punch

DECUS NO. 8-205

MTSAFE

John Alderman, Applied Data Research, Atlanta, Georgia

MTSAFE is a TC-58 version of Disk/DECtape FAILSAFE (DECUS NO. 8-120). If is fairly self-explanatory and incorporates additional messages for the operator to service the magtape.

Minimum Hardware:	PDP-8 with TC-58 Magtape
Other Programs Needed:	Disk Monitor System (DEC-D8-SDAA)
Storage Requirement:	SA-0200; occupies $100\text{-}1377_8$ and uses $1400\text{-}2177_8$ as buffer

DECUS NO. 8-206

DUMP

Barbara M. Rollman, Educational Testing Service, Princeton, New Jersey

DUMP types out the octal contents of any 128-word block on tape or disk. The link (129th) word will be printed and identified. The typeout may be halted in the middle to proceed to the next block on the same device, to switch to a different block and/or device, or to return to the monitor.

Minimum Hardware:	4K PDP-8 with DF32 Disk or TCØ1 DECtape
Other Programs Needed:	DECtape Operating System (DEC-08-SOBO) or Disk Operating System (DEC-08-SDAA)
Storage Requirement:	Location 0-1177; starting address is 1000; 2000-2200 is used as buffer
Source Language:	PAL-D

DECUS NO. 8-207

Cube Root Subroutine

James Kelly, Digital Equipment Corporation, Maynard, Massachusetts

The Cube Root Subroutine is called with an effective "JMS CUBE" with the argument in the accumulator. The subroutine returns to the memory location following "JMS CUBE" with the result in the accumulator and the remainder in MAGIC. The algorithm makes use of the fact that the third order difference of any list of consecutive cubes is always equal to 6 (six).

Storage Requirement:	27_{10} locations
Source Language:	PAL

DECUS NO. 8-208

Evaluating Determinants (from 2-17)

A. Moses, Computer Application Engineering Co., El Paso, Texas

Evaluates determinants with the order in the range from 2 through 17.

Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFCD)
Storage Requirement:	4K
Source Language:	FORTRAN

DECUS NO. 8-209

Editor-With-View

John C. Alderman, Applied Data Research, Atlanta, Georgia

Editor-With-View is the same as the library distributed version of the Disk Editor (DEC-D8-ESAB) with the exception of the V(View) command addition. This command is exactly like the L command for the TTY, except that results are displayed on a storage scope via the software character generator, and the VD8/I or 34D scope controller. The ALT MODE key will display the next line of the text buffer.

Minimum Hardware:	8K PDP-8 with VD8/I or 34D Scope

DECUS NO 8-210

A Real Time Multiple Task Executive Program with Built-In Console Utility Package for PDP-8/S and PDP-8 Computers

C. D. Martin, Jr. and R. L. Simpson, Oak Ridge National Laboratory, Oak Ridge, Tennessee

This routine schedules process control tasks in a real-time and establishes operating priorities. The program occupies about one-third of a 4096-word memory block and accommodates eight major control tasks.

Minimum Hardware:	PDP-8 or 8/S with a real-time interrupt
Source Language:	PAL III

DECUS NO. 8-211

Matrix Manipulation System (MMS) for Real Numbers

Hudai Dirilten
Submitted by: Professor Dr. Yakup Paker, Middle East Technical University, Electrical Engineering Department, Ankara, Turkey

The following matrix operations can be performed by the MMS program: inversion, calculating the determinant, transpose multiplication (any combination of rectangular arrays) of two or more matrices, multiplication of matrices by constants, addition and subtraction. The method used for inversion and computing the determinant is gaussion elimination process; for inversion a unity matrix of adequate size is generated; all other operations are entry by entry arithmetic computations.

Minimum Hardware:	4K PDP-8; ASR-33
Storage Requirement:	600_8 locations for each tape
Source Language:	PAL III

DECUS NO. 8-212 and 8-212a

Obsolete

DECUS NO. 8-212b

PALH (Modified)

Michael Schwabe, Institut Fur Ergonomie, Munich, Germany
Submitted by: Kay Hoke, Straub Medical Research Institute, Honolulu, Hawaii

This is a modification of the March 2, 1970 version of PALH which will modify PAL-D in order to accelerate assemblies from DECtape. It will: 1) number pages during the listing, 2) use a row of dots for pagination, 3) permit pagination both on-line and off-line and 4) run under either DECtape monitor or Disk Monitor System.

Minimum Hardware:	8K PDP-8 with DECtape or disk
Source Language:	PAL-D

DECUS NO. 8-213

4K ALGOL

University of Grenoble
Submitted by: Charles Conley, Digital Equipment Corporation, Maynard, Massachusetts

ALGOL is an algebraic programming language suitable for a wide variety of scientific and other computer programming applications. With certain restrictions and limitations this 4K ALGOL for the PDP-8 includes all routines necessary to compile, load and execute programs written in a subset of the ALGOL language.

Minimum Hardware:	4K PDP-8; high speed reader/ punch is optional
Source Language:	ALGOL

DECUS NO. 8-214

DECI: A Subroutine to Type Outputs in Decimal

John M. Martin, University of California, Psychobiology Department, Irvine, California

This routine will type the decimal equivalent of the octal number in the accumulator on the Teletype from -2048 to +2047 with zero suppression.

Minimum Hardware:	PDP-8; ASR-33
Storage Requirement:	92_{10}
Source Language:	PAL III

DECUS NO. 8-215

Hexapawn

Ralph Mayer, Lexington High School, Lexington, Massachusetts

This version of Hexapawn is similar to that of DECUS NO. FOCAL8-9 with the exception of additional bells and whistles and a smaller storage space requirement.

Minimum Hardware: 4K PDP-8
Source Language: PAL-D

DECUS NO. 8-216

PAL-D Patch

Edward A. Taft III, Saint Mark's School, Southborough, Massachusetts

PAL-D Patch is designed to provide the following added features that are present in field one. It will store excess symbols in field one; ignore rubout characters in input from the high speed reader; and provide formatting of 3rd pass output onto 11-inch long pages. Two known bugs in PAL-D are also corrected.

Minimum Hardware: 8K PDP-8
Other Programs Needed: PAL-D (DEC-D8-ASAA-PB)
Source Language: PAL-D

DECUS NO. 8-217A

PALR

Matthew Simon, Computer Applications, Inc., New York, New York

PALR will determine whether or not the output from the Teletype is an error message. If no error occurs, the output is directed to a TU-2Ø magnetic tape. Symbols are extended into bank one, not on the disk.

Minimum Hardware: PDP-8 with two banks of core storage, DF-32 Disk, TU-2Ø magnetic tape drive
Other Programs Needed: PAL-D

DECUS NO. 8-217B

PALM

Matthew Simon, Computer Applications, Inc., New York, New York

PALM is a bank Ø modification to PAL-D whose purpose is to direct output that usually goes to an ASR-33/35 to PALR (DECUS NO. 8-217A).

Minimum Hardware: PDP-8 with two banks of core storage, DF-32 Disk, TU-2Ø magnetic tape drive
Other Programs Needed: PAL-D

DECUS NO. 8-217C

UTIL

Matthew Simon, Computer Applications, Inc., New York, New York

UTIL enables manipulation of the assembled files that are output on the TU-2Ø by DECUS NO. 8-217A and 8-217B.

Minimum Hardware: PDP-8 with two banks of core storage, DF-32 Disk, TU-2Ø magnetic tape drive
Other Programs Needed: PALM and PALR (DECUS NO. 8-217A and 8-217B)
Source Language: PAL-D

DECUS NO. 8-218

Interpreter of Constitution of Coding Tables

Sahut d'Izan, C.E.R.C.I., Paris, France

This program enables the user to code constants which will be used by a specific program of the problem, for non-numerical purpose. Octal representation is the only usable form.

Source Language: PAL

DECUS NO. 8-219

LISS

Andrew S. French, Department of Physiology, University of Alberta, Edmonton, Canada

LISS demonstrates the figures produced by the orthogonal addition of sine and other wave forms. It has the facility to control phase angles in fixed and continuous modes.

Minimum Hardware: LAB-8 with display
Storage Requirement: 8 core pages
Source Language: PAL-D

DECUS NO. 8-220

FRACPT and TRANS

Kenneth B. Wibert, Department of Chemistry, Yale University, New Haven, Connecticut

In treating data collected using an analog-to-digital converter it is frequently convenient to shift the number one unit to the right and consider it as a fraction having the form: S.XXXXX-XXXXXX, where bit zero indicates the sign and the decimal point is placed between bits 0 and 1. Thus, full scale of the converter would correspond to 0.999_{10} FRACPT and TRANS are two similar routines which output a number in storage as a BCD decimal fraction. FRACPT leads to the number being typed on the Teletype, whereas TRANS inserts the BCD representation into a BCD string (two characters per word) which may be typed out or displayed on a CRT screen.

Minimum Hardware: 4K PDP-8

DECUS NO. 8-220 (Continued)

Storage Requirement: One page
Source Language: MACRO-8

DECUS NO. 8-221

IFIX/FLOAT

Garth Peterson, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

IFIX/FLOAT uses the Floating Point Package (DEC-08-YQYA) to convert floating point numbers to signed 12-bit integers or vice versa. It has been written to produce asethetically desirable results rather than to minimize coding.

Other Programs Needed: DEC Floating Point Package (DEC-08-YQYA)
Storage Requirement: 79 words
Source Language: PAL-D

DECUS NO. 8-222

Disk Memory Retention Test

Edward A. Taft III, St. Mark's School, Southborough, Massachusetts

The DF32 Disk can sometimes drop bits in data written on it and left for a long period of time. There is currently no MAINDEC available that will allow a test pattern to be written and checked at a later time (after the computer has been off for a while, for example, or when the computer has been moved). The Disk Memory Retention Test is designed to allow this test to be made.

Minimum Hardware: PDP-8, 8/I and 8/L with a DF-32 Disk
Storage Requirement: Ø2ØØ - Ø777
Source Language: PAL-D

DECUS NO. 8-223

Power Spectrum

H. D. Schenk, Deutsche Forschungs-und Versuchsanstalt fur Luft und Raumfahrt E. V., Flughafen, Germany

This program is a routine to calculate the correlation function and the power spectrum of a set of points given on tape. The output is via two D/A converters to draw the function or in digital form by punching the values on the high speed punch.

Minimum Hardware: 4K PDP-8 with PCØ1
Other Programs Needed: Floating Point #3 (DEC-8-5-S)
Source Language: MACRO-8

Note: Works only with older version of FPP.

DECUS NO. 8-224

PALT: Patch for Improved Text Handling for PAL-D

Frank Battat, Liberty Gold Fruit Co., Inc., San Francisco, California

This patch eliminates the use of stripped ASCII code for packing, instead the logic subtracts the number 237_8 from each ASCII code. This allows ASCII codes 240_8 through 336_8 to be packed two per word but allows for a more efficient unpacking routine.

Minimum Hardware: PDP-8 with Disk or DECtape
Other Programs Needed: PAL-D (DEC-D8-ASAB-PB)
Source Language: PAL-D

DECUS NO. 8-225

CR8/I Overlay for PAL III Assembler

Robert A. Lammert, Digital Equipment Corporation, Northbrook, Illinois

This overlay allows source input for the PAL III Assembler to come from the CR8/I card reader. The overlay precludes input from either High Speed paper tape reader or TTY.

Minimum Hardware: PDP-8, KSR-33 and CR8/I card reader
Other Programs Needed: PAL III
Source Language: PAL III

DECUS NO. 8-226

FAILSAFE for DECtape Library System

Robert A. Lammert, Digital Equipment Corporation, Northbrook, Illinois

This program provides a means of dumping and restoring the DECtape Library System when the user has only one DECtape transport.

Minimum Hardware: 8K PDP-8, High Speed Reader and Punch, DECtape transport
Other Programs Needed: Disk/DECtape Monitor Head for DECtape system. (DEC-D8-SDAA)
Source Language: PAL III

DECUS NO. 8-227 and 10-23

PDP-10/8 Loader

Allan B. Wilson, Max Planck Institut fuer Kohlen forschung Muelheim, Germany

This interactive set of programs when used in conjunction with a special interface between the PDP-8 and PDP-10 allows the following:

1. The PDP-8 console Teletype to be used as a regular PDP-10 time-sharing station; and

DECUS NO. 8-227 and 10-23 (Continued)

2. By means of commands to the PDP-10 Time-Sharing Monitor, PDP-8 binary programs are stored on a PDP-10 device and sent to the PDP-8 and loaded. This eliminates the need for paper tape or other program storage means on the PDP-8.

Minimum Hardware:	PDP-10 with linescanner and a PDP 8 with special interface to PDP-10 linescanner
Storage Requirement:	One page of PDP-8, about 250_8 in PDP-10
Source Language:	PAL-10 and MACRO-10

DECUS NO. 8-228

A One-Pass Paper Tape Loader for PDP-8 Disk System (OPLOAD)

H. E. Barreveld, Delft University of Technology, Delft, Netherlands
Submitted by: E. Dow, Digital Equipment Corporation, Maynard, Massachusetts

This program is a one-pass binary loader used with the PDP-8 Disk System. The program may load output of PAL-D or LEES (DECUS NO. 8-236).

Minimum Hardware:	4K PDP-8 with DF-32; High Speed Reader and Punch
Other Programs Needed:	Disk Monitor System (DEC-D8-SDAA)
Source Language:	PAL-D

DECUS NO. 8-229

Card III Overlay

Roger L. Bachand, MITRE Corporation, Bedford, Massachusetts

This program makes PAL III available for input from the card reader option (CR8/I) for reading IBM-026 source cards. The user punches on each card one PAL III line of text using the same symbol and operation as in compiling on ASCII source tape. Operation is the same as PAL III.

Minimum Hardware:	4K PDP-8, ASR-33, CR8/I card reader
Other Programs Needed:	PAL III
Source Language:	PAL III

DECUS NO. 8-230

Foreground/Background/8 Now

John Alderman, Applied Data Research, Atlanta, Georgia

The Foreground/Background/8 Now system is now in operation. The Disk/DECtape monitor is used as a background program, and there is a successful emulation of the interrupt system for the background user. Most of the standard software will run in the background mode unchanged, (e.g. FOCAL, EDIT, PAL-D). The Executive is transparent to the casual user who thinks that he has a 4K PDP-8 with single DF-32 Disk, and high speed paper tape.

Minimum Hardware:	8K PDP-8, 2 surface DF-32s
Other Programs Needed:	Disk/DECtape Monitor (as Background)
Source Language:	PAL-D

DECUS NO. 8-231

Data Processing on the PDP-8/S

Frederick W. Holzwarth, George Washington High School, Philadelphia, Pennsylvania

Data Processing on the PDP-8/S is a text which was supplemented by the FORTRAN Programming Manual from Digital Equipment Corporation, the FOCAL Manual and the standard McCrachen text in FORTRAN II. It was designed for use as a course outline for 5 one-hour sessions per week.

DECUS NO. 8-232

TP1Ø

Juergen D. Klauske, Digital Equipment GmbH, Koeln, Germany

TP1Ø copies ASCII files from a PDP-10 format DECtape to the Teletype or high speed punch of a PDP-8.

Minimum Hardware:	4K PDP-8 with TCØ1, TU55, ASR-33 or High Speed Punch
Source Language:	PAL-D

DECUS NO. 8-233

An Octal Housekeeping and Debugging Package for PDP-8 (PDP-8/I) with EAE and Disk

George Lauer, Science Center, North American Rockwell Corporation, Thousand Oaks, California

This system was developed to complement the DEC system monitor, not supplant it. It allows the programmer to use the disk as a true random access memory, without regard to block storage, etc. The system is not file oriented. The routines have been written to assure that they do not touch the user program except when commanded to do so. Also, it allows the user to enter floating point constants or change floating point variables in decimal notation.

Minimum Hardware:	PDP-8 with EAE, DF-32 Disk and High Speed Punch
Other Programs Needed:	SYS/LOAD PUNCH (DECUS NO. 8-234)
Source Language:	PAL-D

DECUS NO. 8-234

SYS/LOAD PUNCH

George Lauer, Science Center, North American Rockwell Corporation, Thousand Oaks, California

This program is used to punch out all programs currently listed in the directory name (DN) block. The tape which is generated can be used to reload the DEC Monitor System

DECUS NO. 8-234 (Continued)

Minimum Hardware: PDP-8 with EAE, DF-32 Disk and High Speed Punch
Source Language: PAL-D

DECUS NO. 8-235

Octal Tape Dump for PDP-8/9/10 DECtapes

Frank J. Nagy, Carnegie-Mellon University, Pittsburgh, Pennsylvania

This program allows the user to dump blocks of PDP-8/9/10 DECtapes as octal numbers. The user is asked for the device (DECtape and unit or disk) and the block number. The block is read in and printed as 12, 18 or 36 bit numbers in octal.

Minimum Hardware: PDP-8 with TCØ1 DECtape control (DF-32 Disk optional)
Other Programs Needed: Disk/DECtape Monitor System (DEC-D8-ASAA)

DECUS NO. 8-236

System and User Files Read and Punch Program (LEES)

H. E. Barreveld, Delft University of Technology, Delft, Netherlands

This program is designed to allow the user to punch and restore either user files or system files from one DF-32 Disk while using the Disk System supplied by Digital Equipment.

Minimum Hardware: PDP-8 with DF-32 Disk; High Speed Reader and Punch
Other Programs Needed: A One-Pass Paper Tape Loader PDP-8 Disk System (OPLOAD) (DECUS NO. 8-228) and Disk System (DEC-D8-ASAA)
Source Language: PAL-D

DECUS NO. 8-237

MADCAP IV, A Multiplexed ADC and Analog Plotting Program

Gerald W. Dulaney, Digital Equipment Corporation, Maynard, Massachusetts

MADCAP IV allows the LAB-8 user more complete exploitation of his hardware environment by supplying a program matrix into which he can readily insert assembly language routines to perform a specific data acquisition and/or analysis task. Floating point arithmetic, scope display, analog plotting, and both analog and digital data input can be performed by the Basic Package. Additional routines are supplied to perform interactive data treatment (including simulation spectrum stripping, smoothing, integration, etal), slow scan signal averaging, acquisition from a photoelectric curve follower, and to perform mass spectral ionization efficiency measurements.

The program can be adapted by the interested user to work with a different hardware configuration.

Minimum Hardware: LAB-8, i.e., PDP-8/I with AXØ8 Lab peripheral, X-Y analog plotter, ASR-33, High Speed Reader

DECUS NO. 8-238

EPRSIM, An Electron Paramagnetic Resonance Simulator

Philip D. Morse, III and James S. Vincent, University of California at Davis, Davis, California

An electron paramagnetic resonance (EPR) spectrum simulation program coded in MACRO-8 for the LAB-8 Computer. The program will display spectra derived from either a Gaussian or Lorentzian derivative line shape. The horizontal length of the display is 512 locations and is adequate for many simulation problems. A spectrum may either be displayed on an oscilloscope or an x-y recorder.

Minimum Hardware: LAB-8 and oscilloscope or x-y reader

DECUS NO. 8-239

PAL III/Editor 8K Link Patch

Charles Schultz, Jr., Schultz Instruments, Inc., Gainesville, Florida

This patch allows the Editor in lower core to communicate directly with PAL III in upper core, thereby effectively producing zero-pass assembler. Five-to-one assembly time reductions may easily be experienced. Both programs continue to behave normally in regard to the low speed reader and punch.

Minimum Hardware: 8K PDP-8
Other Programs Needed: PAL III, August, 1965 or later; PDP-8 Editor, August, 1967 or later
Restrictions: Prevents use of high speed punch for Editor and high speed reader for PAL III
Miscellaneous: Reverses the action of switches Ø and 1 for the Editor; switch 1Ø establishes link to PAL III
Source Language: PAL III

DECUS NO. 8-240

END

Elmer J. Bourque, New Brunswick Research and Productivity Council, Fredericton, New Brunswick, Canada

"END" is a termination program stored on Library System and/or Monitor Unit #8 DECtape, which leaves the memory in a state which allows access to all necessary loaders. Designed primarily for the PDP-8 with TCØ1 and high speed reader, it may be modified for any configuration using DECtape. Loaders in memory after execution of "END" are as

DECUS NO. 8-240 (Continued)

follows: The Monitor Bootstrap, the TCØ1 Library System Bootstrap, the High Speed RIM Loader and the Binary Loader.

Minimum Hardware:	PDP-8 with Teletype and TCØ1
Other Programs Needed:	TCØ1 Library System and/or "Monitor"
Storage Requirement:	200_8-577_8 and 16_8-17_8
Source Language:	PAL III

DECUS NO. 8-241

BUZZTAPE READER/WRITER

Evan Suits
Submitted by: Robert L. Isaacson, University of Florida, Department of Psychology, Gainesville, Florida

The BUZZTAPE READER and WRITER programs can be used to build an inexpensive magnetic tape system for storage and retrieval of data or programs. Both the READER and WRITER occupy locations normally containing BIN. Transfer rate is about 4 msec per 12 bit word, or about 15 seconds for 4K.

Minimum Hardware:	AX08, XR option, stereo tape recorder
Other Programs Needed:	RIM Loader
Storage Requirement:	Reader 7625-7736, Writer 7625-7717
Source Language:	PAL III

DECUS NO. 8-242

DĀTAK I

Digital Equipment Corporation
Submitted by: J. B. Pearce, University of Colorado, Boulder, Colorado

DĀTAK is a single core load interpretive compiler programming system designed for facile manipulation of PDP-5/8 peripherals and data. The program was written by DEC prior to 1965 and is no longer maintained by them. They have replaced DĀTAK, conceptually at least, by their new disk based system INDAC. For the installation not possessing a disk, however, DĀTAK is a valuable tool.

Minimum Hardware:	PDP-5 or PDP-8 Family, Teletype, Simple Homemade Clock (See DĀTAK Manual)
Maximum Hardware:	Original minimum plus 34D Display oscilloscope and a parallel and serial interface
Source Language:	PAL

DECUS NO. 8-243

Amplitude Distribution

H.-D. Schenk, Deutsche Forschungs und Versuchsanstalt fur Luft und Raumfahrt E. V., Flughafen, Germany

This program calculates the amplitude distribution of a set of points which are given on tape or are typed on the teletype. The output is via two D/A Converters. The mean, the variance and the standard deviation are typed on the teleprinter.

Minimum Hardware:	4K PDP-8, ASR-33, PC01, 2 D/A Converters (No. 55, 56)
Other Programs Needed:	Floating Point Package No. 3 (DEC-8-5-S)
Source Language:	MACRO-8

DECUS NO. 8-244

BINSAVE

Michael H. Craven, Digital Equipment Corporation, Maynard, Massachusetts

BINSAVE will punch a specified system or user saved file in binary format. A four instruction patch will allow output to the ASR-33 teletype punch.

Minimum Hardware:	Disk or DECtape
Other Programs Needed:	Disk Monitor System (I/O Routine)
Storage Requirement:	0-2500
Source Language:	PAL-D

DECUS NO. 8-245

Dynamic Octal Disk Debugger

Andrew S. French, Department of Physiology, University of Alberta, Alberta, Canada

This program allows fast efficient inspection and modification of any location on the disk using a visual output. Printout of all locations in a block and listing of directory, contents plus program type, number and starting SAM blocks are available. The program is entirely selfcontained and does not need MONITOR.

Minimum Hardware:	LAB-8 and a DF32 Disk
Storage Requirement:	9 Core Pages
Source Language:	PAL-D

DECUS NO. 8-246

DF32 Disk Routines

Garth Peterson, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

DCIO and DCNI are DF32 disk input-output subroutines which operate with the interrupt facility enabled and disabled respectively. Error checking is fairly thorough and includes address checks before each disk operation and write-lock

DECUS NO. 8-246 (Continued)

checks at the beginning and end of each disk write operation. Loading and calling of DCIO are limited to Field 0; loading and calling of DCNI may be in any field, but it must be the same field.

Minimum Hardware:	PDP-8 or 8/I with DF-32 Disk
Storage Requirement:	1 page, each routine
Source Language:	PAL-D

DECUS NO. 8-247

HELP: A Disk/DECtape Dialogue Program

David P. Weaver, Georgia Institute of Technology, Atlanta, Georgia

This program allows any message typed on the teleprinter to be SAVED and printed upon calling HELP.

Minimum Hardware:	PDP-8, ASR-33
Storage Requirement:	118_{10} locations
Source Language:	PAL-D

DECUS NO. 8-248

SABR - Coded Fast Fourier Transform Subroutine

Gerald N. Cederquist, Cooley Electronics Laboratory, University of Michigan, Ann Arbor, Michigan

Using the Fast Fourier Transform algorithm, this subroutine computes in situ either the direct or inverse discrete Fourier transform of a pure-power-of-two number of complex points. Written for use with the DEC 8K FORTRAN system, it runs in less time and takes less core space than the same algorithm coded in FORTRAN. It has been extensively tested and checked; for example, the subroutine will do a direct followed by an inverse transform of 128 points in 47 seconds with a round trip root mean square error of 1.23 parts per million.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	DEC 8K FORTRAN System
Storage Requirement:	5 pages plus 17 locations on page zero
Source Language:	FORTRAN

DECUS NO. 8-249

Oscilloscope Vector Generator

J. H. Boardman, South Dakota School of Mines and Technology, Rapid City, South Dakota

This is a subroutine requiring exactly one page (128 words) of memory. Its purpose is to draw a linear vector from any point on an oscilloscope display to any other point. There are 5 arguments in the subroutine calling sequence which specify the starting point (X_1, Y_1), the ending point (X_2, Y_2) and a stepsize. The stepsize (range 1 to 7) determines the point density along the vector.

The ASCII tapes which are offered are with or without comments. Please specify which tape you wish. The binary tape is a program which demonstrates the use of the oscilloscope Vector Generator Subroutine.

Minimum Hardware:	PDP-8, EAE, Type 34-D Display
Other Programs Needed:	User written main program
Storage Requirement:	128 words (1 page)
Source Language:	PAL-D

DECUS NO. 8-250

Fast Fourier Transform (FFT)

Kenneth G. Pavel, Trinity College, Hartford, Connecticut

This program uses the Cooley-Tukey algorithm to perform a Discrete Fourier Transform on up to 1024 data points. Input is through a selected A-D channel. The sampling rate is either 0.01 seconds or on every clock pulse, depending on the switch register. The input waveform is displayed in a scaled manner, and then transformed. The final spectrum is viewed through a variable window which is under the control of A-D channels 34-36, and the switch register.

Minimum Hardware:	LAB-8 or PDP-8 with AXØ8 and scope display
Storage Requirement:	Approximately 3K of core
Source Language:	PAL-D

DECUS NO. 8-251 and FOCAL8-60

A System for Production of Problem Sets with Individualized Data

H. Bradford Thompson, Department of Chemistry, University of Toledo, Toledo, Ohio

This system produces problem sets for use in science and mathematics instruction, in which input data are changed for each student. Two programs are involved, (1) a FOCAL program into which the instructor inserts the algebra required to perform the calculations, and (2) a program which accepts a text with data positions marked, and then inserts individualized data from the FOCAL program (without the answers) and prints the copies. The system will work on any family-of-8 machine for which FOCAL is available.

Minimum Hardware:	PDP-8/I with ASR-33
Other Programs Needed:	FOCAL (Any version)
Storage Requirement:	4K
Source Language:	PAL III, FOCAL

DECUS NO. 8-252

PEEP - A Directory Search Program

J. M. Dickson, Rutherford High Energy Laboratory, Chilton, nr. Didcot, Berkshire, England

This program supplements the LIST option in the DEC PIP program. All the information contained in the DN and SAM blocks of a Disk or DECtape system can be accessed and typed out on the teletype as a complete list, or file-by-file as required. Other features are 1) a count of free blocks and

free files, 2) a dump of the contents of SAM blocks (in an 8 x 16 matrix), and 3) a 'halt' option, which allows the user to change the starting address (entry point) of a file to 7636. The program uses the Disk/DECtape Monitor System SYSIO to read and write on the system device.

Minimum Hardware:	Disk(s) (32K) or DECtape
Other Programs Needed:	Disk/DECtape Monitor System
Storage Requirement:	4K
Restrictions:	Operates in Field Ø, and accesses the system device only
Source Language:	PAL-D

DECUS NO. 8-253

Disk Dump on Scope

Brian Underhill, University of Colorado Medical Center, Denver, Colorado

This program displays disk data on the scope screen, a block at a time, in octal. A fast plot routine allows a refresh time of 52 milliseconds or less for minimum flicker. Other functions are available, including searches for strings of words, modification of single words or links on the disk, and hard copy on the teletype.

Minimum Hardware:	PDP-8, 34-D Scope Display, DF-32 Disk (Any size)
Other Programs Needed:	PDP-8 Disk Monitor System, System I/O Routine
Storage Requirement:	Program 0-1377, Buffers 1400-7577
Source Language:	PAL-D

DECUS NO. 8-254

Vector Algebra Package

Bryan D. Young, Department of Medical Cardiology, Glasgow Royal Infirmary, Glasgow, Scotland

This package is designed to operate with the Basic Three Word Floating Point Package (Digital 8-5-S) and enables the user to label three dimensional vectors (i.e. three consecutive three-word floating point numbers) by a single symbol. Its use is similar to that of the Floating Point Package in that vector operations can be initiated by a single instruction. The operation of addition, subtraction, dot product, cross product and modulus of vectors can be simply programmed and full input and output facilities for vectors are available.

Minimum Hardware:	PDP-8, ASR-33
Other Programs Needed:	Basic Three-Word Floating Point Package (Digital 8-5-S)
Storage Requirement:	Loc: 2-4, 64-74, 5200-5577
Source Language:	PAL

DECUS NO. 8-255

SCED: Scope Editor for the AXØ8

R. H. S. Carpenter, Physiology Laboratory, University of Cambridge, England

This scope editor for the LAB-8, offers fast and convenient editing of symbolic text. Lines may be selected by reference to their initial character, and a movable marker may be used to select particular portions of a selected line.

Minimum Hardware:	PDP-8, AXØ8, High Speed Punch and Reader
Other Programs Needed:	AXØ8 Symbol Generator (DECUS NO. 8-158)
Source Language:	PAL III

DECUS NO. 8-256

Binary to RIM Format Converter

Paul Masson, Picker Nuclear, Montreal, Canada

In some cases it may be necessary to use memory locations between 7600 and 7755. The user program overlays the binary loader, and assembler output is in binary format. The binary to RIM Converter takes as input the assembled tape and produces a copy which can be loaded with the RIM loader.

Minimum Hardware:	PDP-8 with High Speed Reader/ Punch
Storage Requirement:	78 Memory Locations
Source Language:	PAL-D

DECUS NO. 8-257

UCONN-EAP, Editor-Assembler

Gerald E. Zajac
Submitted by: Howard A. Sholl, University of Connecticut, Storrs, Connecticut

This program combines the functions of editor and assembler in one program so that the user can edit and assemble a source program in one operation. The assembler is compatible with PAL III and will also accept literals. The editor is similar to the PDP-8 Editors.

Minimum Hardware:	PDP-5 or PDP-8 with Teletype, High Speed Reader is optional
Storage Requirement:	4K
Restrictions:	Length of user's source program is two pages
Source Language:	MACRO-8

DECUS NO. 8-258

NMRCAT-29: A Simplified Signal Averager Program

James W. Cooper, Department of Chemistry, State University of New York at Buffalo, Buffalo, New York

This is a time averaging program for the PDP-8/I computer

DECUS NO. 8-258 (Continued)

specifically designed for use with the HA-60 nmr spectrometer equipped with a digital frequency synthesizer. It generates a linear sawtooth sweep voltage which is used to drive the frequency synthesizer. The synthesizer then sweeps through a preset range at a rate controlled by the computer. The program also contains display, printout, plot, integration and calibration routines for examining the accumulated average.

Minimum Hardware:	4K PDP-8; ASR-33; AX08 Peripheral; nmr spectrometer and digital frequency synthesizer
Storage Requirement:	0-3, 20-127, 200-3115 and 4000-6777
Source Language:	PAL III

DECUS NO. 8-259

Symbolic from Pass 3

M. T. Franklin, The Plessey Co., P. A. Laboratories, Titchfield, Fareham Hants, England

This is a program to produce a modified PAL III symbolic program tape from a previous pass 3 tape using the high speed input-output facilities of the computer. A list of changes, deletions and insertions are read into core store, then the pass 3 tape of the symbolic program to be modified is read on the photo-electric reader and a new symbolic tape is produced at the high speed punch.

Minimum Hardware:	PDP-8, ASR-33, High Speed Reader and Punch
Storage Requirement:	I-11/21-1551
Miscellaneous:	With some exceptions may also be used with MACRO-8
Source Language:	PAL III

DECUS NO. 8-260

TOFAST - Fast Direct and Inverse Discrete Fourier Transform Routines

Peter L. Walton
Submitted by: Dr. William S. Yamamoto, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania

TOFAST is capable of calculating in place either the discrete Fourier transform (DFT) of real series $\{y_i\}$, $i = 0,1,\ldots,N-1$, where $N = 2^M$ and $M = 3,4,\ldots,10$, or the inverse discrete Fourier transform (DFT^{-1}) of the Fourier cosine and sine coefficients, a_k, $k = 0,1,\ldots,n$, and b_k, $k = 1,2,\ldots,n-1$, respectively, where $n = N/2$. Output of the DFT is the Fourier cosine and sine coefficients; output of the DFT^{-1} is the real series. Several modifications are possible which allow for input and/or output to be complex-valued.

Minimum Hardware:	8K PDP-8, (EAE optional, depending on Floating Point Package version)
Other Programs Needed:	Early version of DEC's FPP
Storage Requirement:	Field 0: 20-37, 64-77, 200-277, 400-1377; Field 1: data array (200-)
Restrictions:	Data array must have size 2^M, $M=3,4,\ldots,10$
Source Language:	MACRO-8

DECUS NO. 8-261

QUBIC

Tim Yeager, William Tennent High School, Warminster, Pennsylvania

'QUBIC' plays 3 dimensional Tic-Tac-Toe on an order-4 cube. The program is conversational and uses the Teletype for all I/O. Moves are typed in as 3 coordinates, and outputted using both coordinates and a Teletype printout of the playing board. The strategies employed in playing the game have been found to be extremely good, but the program can be beaten.

Minimum Hardware:	4K PDP-8, ASR-33
Storage Requirement:	Locations 10 through 3143_8
Source Language:	PAL III

DECUS NO. 8-262

Character Overflow Change to PDP-8 PAL 3

A. G. Price
Submitted by: Mrs. J. Manwaring, Documentation Processing Centre, Quay House, Manchester, England

During pass 3 of PAL 3 assembly listing, input text is accumulated a line at a time in high core. If more than 86 characters are contained on one line, overflow will occur into the area reserved for Binary Loader, since there is no check on the number of characters per line. This revision will inhibit storage of characters after the first 86.

Minimum Hardware:	4K PDP-8, ASR-33
Other Programs Needed:	PAL III
Source Language:	PAL III

DECUS NO. 8-263

XYPLOT - A Versatile Plot Routine for the D/A Converter

Eugene E. Wells, Jr., U. S. Army Electronics Command, Fort Monmouth, New Jersey

XYPLOT is a one page subroutine which scales, offsets, and simultaneously plots two integer arrays from any two data fields, using the D/A converter and a conventional x-y recorder. Incorporation of a programmed pen lift makes available to those users having the necessary additional hardware a point plot capability, selectable by properly setting bit zero of the variable PENFLG in the calling sequence. Loading of the additional 41 (octal) memory location program GENX, and setting of bit one of PENFLG allows a y-data array to be plotted versus locally generated, equispaced x-data, with the spacing interval user specified.

DECUS NO. 8-263 (Continued)

Minimum Hardware: PDP-8 with D/A Converter
Other Programs Needed: Floating Point Package III (DEC-Ø8-YQ3A-PB)
Storage Requirement: 1 page, plus 41_8 locations
Source Language: PAL-D

DECUS NO. 8-264

CLOK - AXØ8 RC Clock or External Clock Frequency or Period Measurement

Andre Laviron, INSERM, Hospital Neurologique, Lyon, France

By option of the switch register this program will allow either Frequency or Period measurement, normal RC clock rate, RC clock slowed by 8, RC clock or External clock. Frequencey or Period is typed on the ASR33 every 2 seconds. Precision: 1/8000.

Minimum Hardware: PDP-8/I, AXØ8, ASR33
Other Programs Needed: Floating Point Package #2
Source Language: PAL

DECUS NO. 8-265

Teletype Parity Conversion Program

R. Lee, University of Kent at Canterbury, Canterbury, Kent, England

This tape contains two programs. The first will convert a symbolic tape in ASCII code with parity into one in ASCII code without parity. The second converts a tape in ASCII code without parity into one in ASCII code with parity. Using these programs on-line while typing a symbolic tape will cause a teletype without parity to punch a tape in parity code or vice versa. The programs may easily be converted for use with a high speed reader and punch.

Minimum Hardware: 4K PDP-8, ASR33
Storage Requirement: 2ØØ-267
Source Language: PAL III

DECUS NO. 8-266

IBM Editor

Ted Glattke, Stanford University School of Medicine, Stanford, California

This program provides editing service and 3000_{10} character storage for text from an IBM 2741 terminal. In the present version, it also provides for punched paper tape storage of materials to be listed on the 2741.

The program permits the following operations: (1) correction of text by backspacing over the error and entering the correct character; (2) correction of a line of text by calling back the line; (3) an unlimited number of listings of text stored in the buffer; (4) paper tape output.

Pecularities of the 2741 terminal, including time delays for data control transfer and carriage travel after tabulation and carriage return have been accommodated in the program.

Minimum Hardware: PDP-8, PTØ8, IBM2741 Terminal plus options to change data transfer rate and logic levels from PTØ8 (Options X and F)
Storage Requirement: $ØØØØ$-$Ø777_8$ plus $1ØØØ_8$-6777_8 for buffer
Source Language: PAL III

DECUS NO. 8-267

DARIC - Data Reduction in Columns

J. J. Antal, Army Materials and Mechanics Research Center, Watertown, Massachusetts

DARIC is a formatting and computational program which provides for the reduction of one to six columns of data entered at the ASR keyboard as a function of a single variable. Computation is via the Digital floating point system through a user's data reduction program, the writing rules for which are simplified and standardized by DARIC.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: Floating Point System (Version D) and user's data reduction program
Storage Requirement: All but last page of memory
Source Language: PAL III

DECUS NO. 8-268

Miniloader and Miniloader Punch

G. J. Flanagan, The University of Newcastle Upon Tyne, Newcastle Upon Tyne, England

This is a program which is designed to be loaded as easily as possible from the switch register. Once loaded, the program is capable of loading and starting any other program punched in the correct form, though because of the lack of any checking facility it would normally load a standard binary loader. The miniloader format is such that, if the program is to be loaded at the high-numbered end of the field, the length of the tape is just over half the length of the same program punched in RIM format.

Source Language: PAL

DECUS NO. 8-269

Morse Code Trainer

Jack Harvey, National Data Systems, Inc., Montvale, New Jersey

This program will generate International Morse Code signals as tones in the output to a digital to analog converter. (A DAC is not required. Any flip-flop register program loadable from the AC can be used.) It operates in three modes: 1) Generate random five letter groups, 2) Send characters

typed on keyboard, 3) Send random characters and wait for correct response on keyboard. Speed, character spacing and character set are controlled from the keyboard.

Minimum Hardware: 4K PDP-8 plus flip-flop
Source Language: PAL III

DECUS NO. 8-270a

Disk-DECtape Utility Program

Garth Peterson, South Dakota School of Mines and Technology, Rapid City, South Dakota

The major functions of the Disk-DECtape Utility Program are to save and recover DF32 disk images on DECtape and to build a simple disk 0 to memory field 0 swapping system which allows user-written programs and data to share a single disk. Minor functions include establishing binary loaders, disk and DECtape bootstraps, and a RIM loader in core; depositing and examining messages on DECtape which identify disk images; and clearing DECtapes to all zeroes. Extended memory is desirable.

Minimum Hardware: PDP-8, TC01 DECtape, DF32 Disk
Storage Requirement: 1-3357 (instructions) 1-7577 (total)
Source Language: PAL-D

DECUS NO. 8-271

LIP - Logical "If" Package

Bryan D. Young, University Department of Medical Cardiology, Royal Infirmary, Glasgow, Scotland

LIP enables "IF" statements involving floating point variables to be written in a conventional manner within assembly language programs. The logical relations available are: GT(>), GE(≥), EQ(=), LE(≤), LT(<), NE(≠), logical AND, logical OR.

Minimum Hardware: PDP-8
Other Programs Needed: 3 word Floating Point Package (Digital 8-5-S)
Storage Requirement: 4, 5400-5577
Source Language: PAL-D

DECUS NO. 8-272

IOPACK - A Message and Number I-O Utility Package

Brian Barton and Kurt Metzger, University of Michigan, Ann Arbor, Michigan

IOPACK is one page long and contains: MESAGE for printing messages, OCTIN and DECIN for inputting unsigned octal or decimal numbers; OCTOUT and DECOUT for outputting unsigned octal or decimal numbers.

Minimum Hardware: PDP-8 with Teletype
Other Programs Needed: Teletype printing and reading routines
Storage Requirement: 200_8 locations
Source Language: MACRO-8

DECUS NO. 8-273

Algonquin Assembler

John Kiss, Algonquin College Technical Centre, Ottawa, Ontario, Canada

The purpose of this is to modify the Phoenix Assembler so that it will accept symbolic programs from the card reader, do all three passes automatically, load automatically after assembly, and execute automatically provided no error is found in assembly. No binary tape is punched.

In general the system is supposed to operate without human intervention.

Minimum Hardware: PDP-8, ASR33, Mark Sense Card Reader (HP2761A)
Other Programs Needed: Phoenix Assembler (DECUS NO. 5/8-28a)
Source Language: PAL III

DECUS NO. 8-274

Card Reader Patch to Phoenix Assembler

John Kiss, Algonquin College Technical Centre, Ottawa, Ontario, Canada

This patch, if added to the Phoenix Assembler (DECUS NO. 5/8-28a), will enable the user to enter symbolic programs on mark sense cards on the Hewlett-Packard 2761A Optical Mark Reader.

Minimum Hardware: Mark Sense Card Reader with serial ASCII code output, PDP-8 with ASR33
Other Programs Needed: Phoenix Assembler (DECUS NO. 5/8-28a)
Storage Requirement: 7402-7437
Source Language: PAL III

DECUS NO. 8-275

Grade Compiler

Mark H. Linehan
Submitted by: C. Hamblet, Governor Dummer Academy, Byfield, Massachusetts

The "Grade Compiler" is designed to handle the individual grades of a class of students. It performs the functions of calculating individual averages from typed-in data, storing the final averages and the two-letter code names, typing in alphabetical or rank order all the code names and their corresponding averages, making individual deletions, typing individual averages on demand, calculating the class average, and deleting all the stored data. It will handle up to two hundred and seventy code names and averages in a basic 4K PDP-8 system.

Minimum Hardware: PDP-8 with Teletype
Other Programs Needed: Floating Point Package #2
Source Language: PAL III

DECUS NO. 8-276

Core Editor

Anthony Bolton, Scribner Hill Road, Wilton, Connecticut

This program enables the user to debug his program in core and then get a binary write-out of the program by a simple command. The user can also write a program directly into core by using the insert command which increments the location referenced by typing a space. It has six other commands.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: PAL III

DECUS NO. 5-277

ICBM

Leonard K. Berger, Washington University, St. Louis, Missouri

This is a game program which displays a flying saucer moving across the scope (at a speed which the user sets) and then a rocket is fired to try and shoot down the flying saucer. At any time during the display the program may be restarted by hitting the Return key. The program also has an exit at 7600_8 by hitting the Rubout key. This will go to the DECtape system if available,

Minimum Hardware: 4K PDP-5, ASR33, Type 34 Scope Display
Source Language: PAL III

DECUS NO. 8-278

Single Length Floating Point Package

R. J. Bedding and C. A. Charlesworth, Bath University of Technology, Claverton Down, Bath, Somerset, England

This Single Length Floating Point Package consists of a modified version of DEC-Ø8-YQ1A-PB and is intended as an alternative where input and output accuracy is adequately served by single length working. Entry points and commands are identical with the standard double length version.

The program was developed for on-line calculation employing ADC's and DAC's and is meritorious for its increased speed of calculation.

Minimum Hardware: PDP-8/I and Teletype
Source Language: PAL III

DECUS NO. 8-279

Bar Chart Plotting Subroutine

G. L. Kermez and W. G. Peters, Texas Instruments Limited, Bedford, England

This program was written as part of the main operating program of a power transistor test system produced by the authors. The chart requires 7 constants for its construction. The table can be as large as required. Many charts can be plotted from one table because the table is not altered in any way by the subroutine. This allows the drawing of a family of charts of one set of readings for different classes and numbers.

Minimum Hardware: 4K PDP-8/L, ASR-33
Source Language: MACRO-8

DECUS NO. 8-280

General Sorting Program

M. J. Raymond, Mullards, Southampton, Hampshire, England

This program will sort alpha-numeric records into ascending order. The user specifies the number of characters in each record and the number of records to be sorted on. Input/Output is via High Speed Paper Tape peripherals on the ASR33 Teletype.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: PAL III

DECUS NO. 8-281a

Binary Tape Splicer ASR 33/75A

Ion Grove-White, University of Aberdeen, Aberdeen, Scotland
Revision by: P. Galen Lenhert, Vanderbilt University, Nashville, Tennessee

This utility program punches a length of leader tape and halts. It then transcribes binary tapes as they are fed in, without interruption on the output tape. It finishes by punching a new checksum and a length of trailer tape. Splicer tapes can be read into memory using the binary loader.

Minimum Hardware: PDP-8, ASR33 or 75A High Speed Punch and Reader
Restrictions: Problems may be encountered with high speed punch
Source Language: PAL

DECUS NO. 8-282

C528: Paper Tape Conversion 5 Track (SIRIUS) to 8 Track (A.S.C.I.I.)

A. J. P. Gore, The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire, England

5 track paper tape is translated into 8 track paper tape by inverting the 5 track tape to make the 3 tracks and sprocket holes coincide with the corresponding facilities of the 8 track tape readers of the PDP-8.

Minimum Hardware: 4K PDP-8/I, DF32 Disk, HSR/P
Other Programs Needed: Disk systems programs
Source Language: PAL-D

DECUS NO. 8-283

A.V.S.C. (Analysis of Variance, Single Classification)

J. N. R. Jeffers

Submitted by: A. J. P. Gore, The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire, England

This program computes the means, between-groups sum of squares and mean square, and within-groups sum of squares, mean square, and standard error for univariate data. Versions of the program are available for carrying out transformations on the data on input.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, H.S.R.
Other Programs Needed:	FORTRAN D disk systems programs
Source Language:	FORTRAN D

DECUS NO. 8-284

ASCO - Numerical Sort in Ascending Order

J. M. Sykes
Submitted by: A. J. P. Gore, The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire, England

This program sorts data into ascending numerical order.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, HSR
Source Language:	FORTRAN D

DECUS NO. 8-285

Teletype Input-Output Package

Garth Peterson, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

This is a teletype control package containing subroutines for single-character input and output and for output of packed and open text. These subroutines are Single-field oriented, but provide for interrupt-enabled and disabled operation.

Minimum Hardware:	PDP-8 with Teletype
Storage Requirement:	One memory page
Restrictions:	Modification required for PDP-8/S (Described in write-up)
Source Language:	PAL-D

DECUS NO. 8-286

Two Patches for Disassembler with Symbols

Gary Coleman, The Taft School, Watertown, Connecticut

The first patch for DECUS NO. 5/8-18C (Disassembler With Symbols) allows the user to get a cross reference table of addresses which have been defined on the symbol table. It provides the user with the capability to trace a single address (or several addresses) through a program without having to sift through many pages of other addresses. The second patch allows the disassembler to run on a PDP-8/S by replacing the illegal operate instructions with a legal instruction. This permits a PDP-8/S to accept 6 lettered symbols as opposed to 2 lettered symbols without this patch.

Minimum Hardware:	PDP-8/S, ASR33, High Speed Reader
Other Programs Needed:	DECUS NO. 5/8-18C and DECUS NO. 8-179
Source Language:	PAL III

DECUS NO. 8-287

A PDP-8 Program to Provide Teletype Entry Into the IBM JET System

E. G. Baxa, Jr., Duke University, Department of Electrical Engineering, Durham, North Carolina

This program in effect uses the PDP-8 to simulate a teletype machine which is equipped with X-OFF, X-ON, and EOT features to accomplish entry into an IBM 360 computer with the Job Entry Teletype (JET) interface. Minimal requirements included as peripheral equipment to the basic PDP-8 are an alternate teletype with FORTRAN keyboard and a standard Dataphone Set. The program provides for teletype entry into the Jet System from the keyboard or paper tape reader. A teletype page print and/or tape punch record of the transmission is obtained.

Other Programs Needed:	TUCC
Source Language:	PAL

DECUS NO 8-288

GRAYCONV (Gray Code to Binary Code Converter)

Kees Bruin, Digital Equipment Corporation, The Hague, Holland

GRAYCONV converts a binary word in gray code from 1 to 12 bits to an equivalent binary word.

DECUS NO. 8-289

"ULKA" The Ultimate Kaleidoscope

Dr. A. S. French, University of Alberta, Edmonton, Alberta, Canada

"ULKA" is a true kaleidoscope program for use on the LAB-8 computer. Unlike other kaleidoscope programs "ULKA" is completely automatic. No user interaction is required to produce a dazzling array of patterns.

Minimum Hardware:	LAB-8
Source Language:	PAL-D

DECUS NO. 8-290

Skinny BIN Loader

Garth Peterson, Institute for Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

This is a condensed paper tape binary loader, designed to avoid conflict with the TC01 DECtape Library bootstrap or with the disk data break.

Minimum Hardware:	PDP-8 with Teletype, High Speed Reader is desirable
Other Programs Needed:	RIM Loader
Source Language:	PAL-D

DECUS NO. 8-291

Tape to Memory Comparitor (6-channel)

T. D. Brenig-Jones, Digital Equipment Co., Ltd., Reading, England

This program compares the contents of a 6-channel binary format tape with those of core memory, and prints any differences detected.

Minimum Hardware:	4K PDP-8, ASR33, High Speed Reader
Storage Requirement:	1 page, locations 7400 to 7577
Source Language:	PAL III

DECUS NO. 8-292

Fast Fourier Transform and Fast Walsh-Fourier Transform

R. G. Smith, Carleton University, Ottawa, Ontario, Canada

Program 1 (FFT) computes the 512 point energy density spectra of two real signals using the Fast Fourier Transform algorithm. The FFT of a single complex signal may also be computed with minor modifications to the program. Program 2 (FWFT) computes the 512 point Fast Walsh-Fourier Transform of a real signal. Fixed point arithmetic is used throughout both programs for all computations. A hardware bit-inverter is employed for speed, and auto-ranging is used to decrease roundoff error.

Minimum Hardware:	PDP-8 with EAE, A/D converter (at least 2 channels), Display System, External Interrupt and Hardware Bit-Inverter
Storage Requirement:	0-4177
Source Language:	PAL

DECUS NO. 8-293

Atomic Coordinate Program

Kenneth B. Wiberg, Yale University, New Haven, Connecticut

This program facilitates the development of the atomic coordinates of a molecule with bond lengths and angles as the input data. It contains facilities for rotating, translating and modifying coordinates, and will automatically insert secondary and tertiary hydrogens on a carbon skeleton. The resulting data may be punched on tape in a form which may be read back in at a later time.

Minimum Hardware:	4K PDP-8
Source Language:	MACRO-8

DECUS NO. 8-294

Lettering Program

Peter L. Barnett and Joseph B. Scrandis, Computer Applications, Incorporated, New York, New York

This program produces large, easily read lettering on paper tape using either the high or low speed punch. All printed teletype characters are included, and non-printing characters are ignored. The letters are eight columns high and proportional in width. If used with the disk monitor system, the program will return to it if a Control/C is typed.

Minimum Hardware:	PDP-8/I with either high or low speed (teletype) punch
Storage Requirement:	200-1423
Source Language:	PAL

DECUS NO. 8-295

COMBIN

A. Moses, Computer Application Engineering Company, El Paso, Texas

COMBIN is a combined loader for BIN and CBL paper tapes. The CBL format tapes described in DECUS NO. 8-26 can be loaded in about 75% of the time required to load equivalent BIN tapes. Therefore, many installations now have most of their tapes converted into CBL format. The problem was to have both a BIN and a CBL loader on the last page of memory so that they could be protected. As a sacrifice, the RIM loader is no longer on the protected last page of memory.

Minimum Hardware:	PDP-8/L, 4K
Storage Requirement:	7600-7772
Restrictions:	No High Speed Reader
Source Language:	PAL

DECUS NO. 8-296

Edit Routine

J. Russell Lemon, United States Air Force, Rome Air Development Center, Rome, New York

This is a minimum length (slightly over 3 pages) edit routine capable of editing, reading into, reading out of and jumping to any core location. It accepts only valid inputs (octal only). Program input can be either ASCII, binary or RIM. Output can be ASCII, binary or RIM tape. The program can edit itself and is a useful tool for programming in machine language.

DECUS NO. 8-296 (Continued)

Minimum Hardware: PDP-8 and Teletype
Storage Requirement: 6760-7577
Source Language: Machine Language

DECUS NO. 8-297

TRACE

Kenneth B. Wiberg, Yale University, New Haven, Connecticut

TRACE resides in field 1 and operates in an interpretive fashion on programs in field Ø. It combines many of the features of PALEX (DECUS NO. 5/8-55) and DDT as well as handling instructions to the floating point interpreter. Provisions are made for examining and modifying single word and also floating point entries. Locations and single word entries may be given symbolically or in octal form. TRACE gives a complete record of any desired portion of the user's program and will simulate the entire program including IOT's.

Minimum Hardware: 8K PDP-8
Storage Requirement: All of one field (normally Field 1)
Source Language: PAL-D

DECUS NO. 8-298

OCTMON - An Octal Monitor for the PDP-8 Computer

Peter Lemkin, National Institute of Health, Bethesda, Maryland

OCTMON is an octal debugging monitor for the PDP-8 that facilitates debugging for machines with several memory fields. It is relocatable within a field, and may be put in any field. It uses 1400 (octal) locations and 13 (octal) locations in page 0 of its resident field. It also uses 11 (octal) locations of any other field in which there is a breakpoint. Only one restorable breakpoint is allowed at any time and may be in any field. There are options to dump out sections of memory, punch and read bin tapes, enter octal numbers into memory, start the program being tested, and enter a number into the MQ. The monitor will work without EAE, extended memory and without DECTAPE/DISK systems.

Minimum Hardware: PDP-8
Source Language: MACRO

DECUS NO. 8-299

Latency Histogram and Calculation

Eugene S. Boyd, University of Rochester Medical Center, Rochester, New York

This program plots a histogram of, and calculates the mean and SD of the latency of a variable phenomenon, such as an evoked response. It finds either the maximun or minimum value within a defined region of the curve and measures latency from beginning of the sweep or some point of interest, such as a shock artifact. Groups of points, as in bimodal distributions, may be handled separately.

Minimum Hardware: LAB-8/I
Other Programs Needed: (DEC-08-YQ2A-PB and DECUS NO. 5/8-23B are incorporated in binary tape)
Storage Requirement: 4K
Source Language: PAL III

DECUS NO. 8-300

Noise Generator

H. -D. Schenk, Deutsche Forschungs - und Versuchsanstalt fur Luft - und Raumfahrt EV, Flughafen, Germany

This program, which is written as a subroutine, creates a pseudo-random voltage with a gaussian probability density function. Also the appropriate binary noise is available. The bandwidth can be selected by the programmer.

Minimum Hardware: 4K PDP-8, D/A Converter (#55), Digital Output Register (#30)
Storage Requirement: One page of memory
Source Language: MACRO-8

DECUS NO. 8-301

STOR: A Store Instruction for the PDP-8 Disk Monitor

Joseph Green, University of Alberta, Edmonton, Alberta, Canada

STOR provides a method for storing the disk monitor system on magnetic tape (unit 8) at the end of the working session, and for restarting the disk monitor at the beginning of a new session on the PDP-8.

Minimum Hardware: 4K PDP-8, DF32 Disk File, 32K, DECtape Drive
Source Language: PAL-D

DECUS NO. 8-302

Overlay Modifications to the Floating Point System Packages, DEC-08-YQYA

Peter L. Walton
Submitted by: Dr. William S. Yamamoto, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania

This is an expansion of the present 4 floating-point packages into 24 different packages having capabilities of basic functions, extended functions, output controller, output formatter with 4 I/O functions, extended memory referencing ability and EAE utilization. Also an error in the present normalization routine is corrected.

Minimum Hardware: 8K PDP-8, EAE
Other Programs Needed: DEC-08-YQYA
Source Language: MACRO-8

DECUS NO. 8-303

Alterations of the Basic Floating-Point Package and Additional Subroutines

W. Roos, Philips Research Laboratories, Eindhoven, Netherlands

Using the basic floating-point package DEC-08-YQ1B, or the other existing versions, this package can only be called from instruction - and data field zero. For a PDP-8/I with extended memory it becomes necessary for additional subroutines to overcome this drawback.

Restrictions:	Data and instruction fields must be the same. Addresses of additional subroutines must be locations 5, 6 and 7 of page zero
Source Language:	PAL

DECUS NO. 8-304

Pseudo-Noise (P-N) Sequence Test

R. G. Smith, Carleton University, Ottawa, Ontario, Canada

This program can be used to determine the statistical characteristics of a pseudo-random sequence generator. The probability density function can be studied with the aid of an amplitude histogram, and measures of the "randomness" can be determined with correlation diagrams, sample function displays, and scattergrams. All diagrams are displayed on the CRT.

Minimum Hardware:	PDP-8 with EAE, A/D Converter, CRT display
Storage Requirement:	Program: 0-776; Data: 2001-5776; Axis points: 1001-2000
Source Language:	PAL

DECUS NO. 8-305

PAL III Assembler Overlay for Card Reader Input

B. J. Little, Sandia Corporation, Livermore, California

This overlay replaces high speed reader input with card reader input. Character validity and data loss check is made on input cards. Error diagnostics allow recovery from most read and hardware error halts.

Minimum Hardware:	PDP-8/I, ASR-33, CR-8/I. High Speed Punch optional
Other Programs Needed:	PAL III Assembler (DEC-08-ASB1-PB)
Restrictions:	Card input to be in Hollerith code
Source Language:	PAL III

DECUS NO. 8-306

LDR - A One Pass Transparent Loader

Douglas Henry, Physics-Astronomy Department, Vanderbilt University, Nashville, Tennessee

LDR replaces standard Disk Monitor loader but never requires a second pass and is completely transparent. It is in two files: LDR, which is called by the user to start the load and .LDR, which does most of the work.

Minimum Hardware:	4K PDP-8, DF32, Teletype
Other Programs Needed:	Disk Monitor head must be in core
Restrictions:	Requires blocks 367-375 for scratch
Source Language:	PAL-D

DECUS NO. 8-308

PDP-8 Morse Code Sender

Wayne L. Dohnal
Submitted by: Dr. William C. Orthwein, Southern Illinois University, School of Technology, Carbondale, Illinois

The program reads input from ASR keyboard or tape reader and translates all valid characters into Morse Code. Output in the form of a square audio wave is taken from D to A Converter #1 and fed into an audio amplifier. Invalid input characters are ignored by the program.

Minimum Hardware:	4K PDP-8, D/A Converter, audio amplifier with speaker
Restrictions:	No input buffer in program - Keyboard input cannot be faster than code output
Source Language:	PAL III

DECUS NO. 8-309

Patches and a Utility Program for LAB-8

Charles P. Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This is a patch for the Basic Averager to allow the high speed punch to dump the ASCII values which are received after a T command in the first section.

Minimum Hardware:	PDP-8/I or 8/L with AXØ8 (LAB-8)
Other Programs Needed:	LAB-8 Basic Averager and Advanced Averager
Storage Requirement:	4K
Source Language:	PAL III

DECUS NO. 8-310

BIN Punch for Extended Memory

Rainer Schongar, Siemens, Munich, Germany

This program is useful for simple loading of tested FORTRAN programs via the Binary Loader. The field instructions for the Binary Loader are automatically generated by this program.

DECUS NO. 8-310 (Continued)

In one field the Binary punch for extended memory shares the core memory with the Binary loader.

Source Language: PAL

DECUS NO. 8-311

Card to Tape Conversion with Diagnostics

B. J. Little, Sandia Corporation, Livermore, California

Converts cards punched in Hollerith code to paper tape punched in ASCII code on either high or low speed punch. I/O devices are operated at maximum speed. Character validity and data loss checks are made on input cards. Error diagnostics allow recovery from most conversion halts.

Minimum Hardware: PDP-8/I, ASR33, CR-8/I
Storage Requirement: Program: 0000-0600, Buffer: 0600-7600
Source Language: PAL III

DECUS NO. 8-312

DECtape Emulator

John Alderman, Applied Data Research, Atlanta, Georgia

This pair of patches to the Disk/DECtape Monitor Builder, and PIP, together with the FOCAL program for tape generation, will allow the TC-58/TU20 IBM-Compatible- Magtape unit to emulate a non-systems device DECtape for operation with the monitor. The coding also serves as a coding example for both interrupt and non-interrupt magtape handlers. The "Block" format is exactly that used by David Custer in "A Disk Simulator Using a Single Industry Standard Magnetic Tape Unit" published in DECUS Fall 1969 Symposium.

Minimum Hardware: 8K PDP-8, TC-58, TU20
Other Programs Needed: Disk Monitor System Builder and DF32 Disk System PIP, UIOF
Source Language: PAL-D

DECUS NO. 8-313

Obsolete

DECUS NO. 8-314

8K FORTRAN Library CR8/I Card Reader Input Routine

Rainer Schongar, Fa. Siemens AG, Munich, West Germany

This routine reads 12 row, 80 column punched cards by a simple FORTRAN statement (i.e., READ (3,10).....where 3 is the card reader Device Number) as well as by input from the teletype.

Minimum Hardware: 8K PDP-8/I, CR-8/I
Other Programs Needed: 8K FORTRAN System with modified Part 1 of Tape 1 (IOH with extended system transfer table)
Storage Requirement: 3 pages
Restrictions: A "CALL ECARD" is necessary to initialize the routine before the first use in a FORTRAN program
Source Language: SABR

DECUS NO. 8-315

Block-Modify

Rudi Stange, Digital Equipment GmbH, Muncih, West Germany

This routine allows examination and modification of specified Disk (DECtape) block contents. Input and Output is compact and space saving.

Minimum Hardware: 4K PDP-8, Disk or DECtape
Other Programs Needed: Disk Monitor
Storage Requirement: 2 pages plus one for buffer space
Source Language: PAL-D

DECUS NO. 8-316

CORR (Compute Correlation Matrix)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

This program computes the means and standard deviations and the matrix of correlation of coefficients, for multivariate data. A separate version of the program transforms the data to their common logarithms before computing means, sums of squares, etc.

Minimum Hardware: 4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed: FORTRAN D Disk Systems Programs
Source Language: FORTRAN D

DECUS NO. 8-317

EIG (Compute Eigenvalues and Eigenvectors)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

The extraction of eigenvalues and eigenvectors is carried out by means of a group of programs, the intermediate stages of the computations being stored on the disk. The eigenvalues, and the associated eigenvectors, are extracted one by one, starting with the largest eigenvalue, and the process can be terminated as soon as sufficient eigenvalues have been extracted from the basic data matrix. The programs were designed to enable principal component and canonical variate analyses to be carried out.

Minimum Hardware: 4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed: FORTRAN D Disk Systems Programs
Source Language: FORTRAN D

DECUS NO. 8-318

PART (Partitioning of Treatment Sums of Squares)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

PART is designed to enable the treatment sum of squares from an experimental design to be partitioned into any desirable set of orthogonal or non-orthogonal comparisons. The treatment effect, and the variance ratio are also computed for each comparison.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-319

RAND (Computation of Random Fractions)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

This program computes a designated number of random fractions in the range 0.0000 to 0.9999. The computed fractions represent a sample from a uniform distribution.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-320

MMMS (Calculation of Minimum, Mean, Maximum and Standard Deviation)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

This program calculates the minimum, arithmetic mean, maximum and standard deviation of any number of sets of up to 20 variables, presented in a standard order. It is intended as a simple method of summarizing multi-variate data, and is used as an auxiliary program for other multivariate programs, for example, the CCMP program.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO 8-321

REG-2 (Curvilinear Regression) REG-4 (Linear Regression)

Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

REG-2 - This program computes the values a, b and c for a second degree polynomial equation of the form: $Y=a+bX+cX^2$ where X and Y can represent any number of values.

REG-4 - Linear regression for simple linear, exponential and hyperbolic relationships.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-322

CCMP (Correlation of Components) and CVAL (Computes Values of Principal Components)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

CCMP calculates the correlation between two sets of components to produce a rectangular matrix of correlation coefficients. It can also be used to correlate two sets of variables for which the correlations within each set have already been calculated or are of no interest.

CVAL computes the values of the first n principal components for each of the original data points of the data matrix. It may also be used to compute the values of canonical variates.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-323

CRC (Convert Peak Heights on an Auto-Analyzer Chart to PPM and Percentage)

Pat E. Hodgson
Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

1) Converts standard peak heights to optical density; 2) Computes linear regression y=a+bx; 3) Converts sample peak heights (ppm concentration) to optical density and ppm; 4) Subtracts blank values, if any, from the samples; 5) Calculates percentage concentration.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-324

TSP - Trend Surface Plotting

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

This program consists of a group of segments for which the output of one segment is the input of the next. It enables the significance of linear, quadratic, and cubic trend surfaces to be determined for each of a number of variables on the coordinates of their distribution in two-dimensional space. The significance of the various surfaces having been determined, the fitted surface can be plotted by means of a contour map on the teletype.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-325

SBSM - Calculation of Duplicate Sub-Samples from Primary Data

A. J. P. Gore, The Nature Conservancy, Lancashire, England

This program is designed for use following a standard sub-sampling routine. Such a routine takes duplicate sub-samples of materials which would be too laborious to sort completely. It specifically refers to mixed vegetation cropped from quadrats of given size but could be applied to any analogous sampling situation. A sub-sub-sampling procedure is incorporated to allow for materials within the sub-samples which are still too laborious to sort, in this specific instance, live and dead plant parts. The output data can be used in an analysis of variance to test for effects of both sampling and sub-sampling.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-326

MLWI - Malawi Land Use Survey Analysis

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Lancashire, England

This program was developed to undertake the analysis of the data from the Malawi Land Use Survey. It calculates the proportions and areas of land in each of 15 land-use classes, together with their standard errors. The proportions and areas in the broad classes of "cultivated," "uncultivated," and "uncultivable" are also computed, with the standard errors.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-327

CLAN (Cluster Analysis) and GRMN (Calculate Group Means)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

CLAN performs a cluster analysis on data for which the nearest neighbor to each individual point has been calculated. The Algorithm groups the points into clusters which contain a pair of mutually nearest points and all points which refer to points already included in the groups as their nearest neighbors.

GRMN calculates the means of groups of points selected from a larger matrix of points and variables. It is intended for the calculation of means of multivariate data which have previously been subjected to cluster analysis, so as to prepare the data for the next stage of the clustering process.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-328

NNAN (Nearest Neighbor Analysis) - OREG (Orthogonalized Regression Analysis) - OREH (Additional Orthogonal Regression Coefficients)

J. N. R. Jeffers
Submitted by: A. J. P. Gore, The Nature Conservancy, Grange-over-Sands, Lancashire, England

NNAN computes, for each set of points, the nearest neighbor in n-dimensional space, and the distance to this neighbor.

OREG calculates the orthogonalized regression of one or more dependent variables on the principal components of up to 20 regression variables.

OREH, an auxiliary program to OREG, adds the corresponding orthogonalized regression coefficients for nominated components to give a single vector of standardized regression coefficients.

Minimum Hardware:	4K PDP-8/I, DF32 Disk, High Speed Reader
Other Programs Needed:	FORTRAN D Disk Systems Programs
Source Language:	FORTRAN D

DECUS NO. 8-329a

FOCARL, Version 14

David Wolfe, Carleton College, Northfield, Minnesota

FOCARL, V14 is a 4K version of COLPAC 1970 (DECUS NO. 8-335). It runs under TSS/8 and features random access disk data storage and LIBRARY commands as well as COLPAC's relational IF, computed GOTO, computed I/O format control, OPTIONS (reader, punch, line-printer, etc.), BREAK from

DECUS NO. 8-329a (Continued)

FOR loop, decrement in FOR, and double subscripting. COLPAC's graphic commands are ignored, so any small COLPAC program can run in FOCARL.

Minimum Hardware:	PDP-8, disk, time-sharing hardware and clock
Other Programs Needed:	TSS/8 (Edusystem 50) or equivalent
Storage Requirement:	18 TSS/8 disk segments
Restrictions:	Compiled under PAL-8. Requires conditional assembly
Miscellaneous:	Hardware EAE is optional. Room has been left for non-EAE coding
Source Language:	PAL

DECUS NO. 8-330

TSS/8 ALGOL

University of Grenoble
Submitted by: James D. Bailey, Digital Equipment Corporation, Maynard, Massachusetts

TSS/8 ALGOL is 4K ALGOL (DECUS NO. 8-213) adapted for TSS/8. It is a compile and go system which, like 4K ALGOL, permits most of the features of subset ALGOL 6Ø.

Minimum Hardware:	TSS/8
Other Programs Needed:	TSS/8 EDIT for source program preparation, also DECUS NO. 8-213
Storage Requirement:	8K Disk file

DECUS NO. 8-331

Roulette

Ronald Servi and Leslie Servi, Lexington High School, Lexington, Massachusetts

This program plays a game of roulette. The user has 100 chips to start, with which he can bet on any number from 0 to 20. Three bets are allowed for every spin of the wheel on 1, 2 or 4 numbers.

Minimum Hardware:	PDP-8
Other Programs Needed:	CINET-BASIC (DECUS NO. 8-159)
Source Language:	CINET-BASIC

DECUS NO. 8-332

The Civil War Game

Ronald Servi, Lexington High School, Lexington, Massachusetts

This program, created to fulfill a U. S. History assignment, presents a three month picture of the Civil War in the form of a report to the commander-in-chief of the Union Army. The player decides which strategy, amount of weapons, men and money are necessary. The computer, in addition to playing for the South, also determines what action takes place during the war.

Minimum Hardware:	PDP-8
Other Programs Needed:	CINET-BASIC (DECUS NO. 8-159)
Source Language:	CINET-BASIC

DECUS NO. 8-333

8K PAL-D Assembler for 4K Disk Monitor System

Charles H. Conley, Digital Equipment Corporation, Maynard, Massachusetts

This 8K version of the PAL-D Assembler will assemble large programs much more quickly than the 4K version.

Minimum Hardware:	8K PDP-8, DF32 or RF08 disk, of DECtape
Storage Requirement:	8K
Source Language:	PAL-D

DECUS NO. 8-334

KVEDIT

Edward Friedman and Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

KVEDIT is the standard PS/8 Text Editor modified for scope display. All normal editing commands are available as well as three additional commands for display control.

Minimum Hardware:	8K PDP-8, DECtape or Disk, KV8/I Graphics
Other Programs Needed:	PS/8 Operating System
Source Language:	PAL8

DECUS NO. 8-335

COLPAC

Mark Bramhall
Submitted by: Paul Scriven and Mark Bramhall, Digital Equipment Corporation, Maynard, Massachusetts

COLPAC is an 8K to 12K version of FOCAL with many extended and added instructions and routines. COLPAC is short for Carleton On-line Language for Plotting and Arithmetic Calculations.

Minimum Hardware:	8K PDP-8/I, KV8I, 8K PDP-8/L BAO8 KV8L
Storage Requirement:	8K or 12K
Source Language:	PAL

DECUS NO. 8-336

DECtape Library System Modifications

William Leal
Submitted by: Ernest Hayden, Speech Communications Research Laboratory, Santa Barbara, California

The tapes and documents provided permit the PDP-8 user running under the DEC-Ø8-SUA1-LA DECtape Library System to call in one program from another, and the ability to write programs which may be executed, and, when completed, leave storage undisturbed, much like the system programs. These programs are called phantom programs. Users running under DIGITAL-8-7-S Rev 7/25/66 may make use of the phantom

DECUS NO. 8-336 (Continued)

features as is, but MODIND and OCTDMP will have to be modified to accommodate the different directory format.

Minimum Hardware:	4K PDP-8, 1TCØ1 DECtape Unit, EAE
Other Programs Needed:	DEC-Ø8-SUA1-LA or Digital-8-7-S Rev. 7/25/66
Source Language:	PAL III

DECUS NO. 8-337

DIBOL II Software System

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Withdrawn

Contact DEC Business Products group for further information

DECUS NO. 8-338

BIN and CBL Loader

Brian E. Wood, Weston High School, Weston, Connecticut

The combination BIN and CBL loader is used to load paper tapes in either BIN or CBL format. The program features automatic selection of the format in use so no switch register setting is needed. The program currently operates with the PR-8 high speed paper tape reader but it can be modified to use the ASR-33 reader.

Minimum Hardware:	PDP-8, PR8 reader or ASR33 reader (with modifications)
Storage Requirement:	One page (7600-7777)
Source Language:	PAL III

DECUS NO. 8-339A

PST (Post Stimulus Time) and Latency Histogram for the LAB-8

Charles P. Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program records all signals crossing a set threshold after a given event. The program is used most frequently in experiments dealing with the response of a single nerve cell to a stimulus. Either Post stimulus time or latency histograms may be formed.

Minimum Hardware:	PDP-8/I or 8/L with AXØ8 and RM503
Storage Requirement:	4K
Source Language:	PAL III (PAL-10, PDP-10 formatted DECtape)

DECUS NO. 8-339B

Time Interval Histogram Program

Charles P. Merrill, Digital Equipment Corporation, Maynard, Massachusetts

Records the time between events occurring on Schmitt trigger 2 of the AXØ8. The display is a frequency distribution showing the duration of the interval vs. its frequency of occurrence.

Minimum Hardware:	LAB-8 (PDP-8/I or 8/L with AXØ8)
Other Programs Needed:	Write-up - DECUS NO. 8-339A
Storage Requirement:	4K
Source Language:	PAL III

DECUS NO. 8-340

The Auto and Cross-Correlation Program for the LAB-8

Richard Rothman
Submitted by: Charles Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program will perform auto or cross-correlation on analog signals in real time. There are two versions, one for use with EAE and one for use without EAE. The delay between points is variable from 100 usec. to 204.7 msec. Number of points in correlogram can be varied down from 4 to 513.

Minimum Hardware:	PDP-8/L or 8/I, AXØ8, RM503, EAE if available
Storage Requirement:	4K
Source Language:	PAL 1Ø

DECUS NO. 8-341

LISP-8

William Leal
Submitted by: Ernest Hayden, Speech Communications Research Laboratory, Santa Barbara, California

LISP-8 is a semi-interpretative LISP-like list processing package. Problem programs are "compiled" by the assembler, and the object code is interpreted by the package. Its structure makes it incompatible with LISP 1.5, but many of the same problems may be solved. It is recursive, permits subroutines.

Minimum Hardware:	4K PDP-8, EAE
Storage Requirement:	12 pages
Source Language:	PAL III

DECUS NO. 8-342

STAP-8; Spike Train Analysis Program

Urs R. Wyss
Submitted by: Charles Merrill, Digital Equipment Corporation, Maynard, Massachusetts

STAP-8 is a subroutine package for basic statistical analysis of stochastic point processes, written in PDP-8's PAL symbolic assembler language and available as a machine language perforated tape in binary format. Main effort was not made on sophisticated statistical techniques, but rather on a easy to control, variable program library, including CRT-display, paper tape output and teletype listings.

Minimum Hardware:	PDP-8/I with AXØ8
Other Programs Needed:	Floating point package DEC-8-25-E/A
Storage Requirement:	4K
Source Language:	PAL III

DECUS NO. 8-343

Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8

Paul F. Sullivan, Cornell Aeronautical Laboratory, Inc., Buffalo, New York

This document describes a hardware modification to the PDP-8 or LINC-8 which protects software from obsolescence caused by the addition of new devices to the interrupt and/or data break facilities and allows significant savings of money and effort in interfacing further devices to the computer. The hardware also provides the computer with a dynamic priority interrupt facility.

Source Language:	Document only

DECUS NO. 8-344

Toledo Extended Memory Binary Punch

H. Bradford Thompson, University of Toledo, Toledo, Ohio

This program operates in exactly the same manner as does the DEC binary punch (DEC-8-5-U) when field designations are not desired on the binary tape. However, provision for changing the field from which data is taken, and for inserting a field designation on the punched tape are included.

Minimum Hardware:	8K PDP-8
Storage Requirement:	One page
Source Language:	PAL III

DECUS NO. 8-345

EDIT-PAL

F. C. Owen, General Railway Signal Company, Rochester, New York

EDIT-PAL is an overlay and addition to provide a coupling between Editor (DEC-Ø8-ESAB) and PAL III Assembler (DEC-Ø8-ASB1) plus listing line numbers and reporting the vacant buffer balance.

Minimum Hardware:	8K PDP-8, ASR33
Other Programs Needed:	Editor (DEC-Ø8-ESAB) and PAL III (DEC-Ø8-ASB1)
Storage Requirement:	Field Ø, ØØØØ-1627 and buffer Field 1, PAL III
Source Language:	PAL III

DECUS NO. 8-346

Pollution Game

James E. Storer, Lexington High School, Lexington, Massachusetts

The player is elected (?) premier of a small communist island and asked to administer it for several years.

Minimum Hardware:	TSS-8
Source Language:	BASIC

DECUS NO. 8-347

DUBAVG

Eugene E. Wells, Jr., U. S. Army Electronics, Fort Monmouth, New Jersey

DUBAVG is a subroutine which collects high speed data, smooths via two word arithmetic averaging, and scales the result to millivolts. As many as 4096 runs of 2048 points each may be averaged, limited only by the word length of the runs counter and size of the core field which contains the double word length sum, respectively.

The program has been optimized to allow both the minimum (adjustable) point spacing and the maximum run repetition rate. Minimum point spacing is about 35 microseconds. DUBAVG is core field relocatable, and allows its buffer and sum storage to occupy any core fields whatever.

Minimum Hardware:	PDP-8 with AXØ8
Other Programs Needed:	Signed Single Precision Divide (DEC-Ø8-FMCA)
Storage Requirement:	One page, plus 50_8 locations, exclusive of auxiliary subroutines
Source Language:	PAL-D

DECUS NO. 8-348

Mini Binary Punch

Frank Melchior, Jr., National Center for Atmospheric Research, Boulder, Colorado

This program accumulates patches onto a binary tape so that they can be reloaded if core gets wiped out.

Minimum Hardware:	PDP-8, ASR33
Storage Requirement:	12 decimal locations
Source Language:	Machine Language

DECUS NO. 8-349

Octal Debugging Technique with View

Larry McGimsey, Western Kentucky University, Bowling Green, Kentucky

This program permits the display of 20_8 consecutive core locations on a LAB-8 system from field Ø or field 1. The program is a modification of ODT that uses 4 pages instead of 3, and allows operations on both field Ø and field 1. The word search and punch routines have been deleted.

Minimum Hardware:	4K PDP-8, ASR33, AXØ8 with scope
Storage Requirement:	1000_8 locations, plus 4 and 5 in field Ø and 4, 5 and 6 in field 1
Source Language:	PAL-D

DECUS NO. 8-350

Wilcoxon-White Two Sample Rank Test

Jens G. Rosenkrantz, M. D., Childrens Hospital of Los Angeles, Los Angeles, California

This nonparametric statistical test may be used in comparing unpaired samples and assigns ranks to the pooled measurements, comparing the ranks as ordinal numbers in two groups.

Minimum Hardware:	8K PDP-8, High Speed reader and punch
Other Programs Needed:	8K FORTRAN System
Source Language:	8K FORTRAN

DECUS NO. 8-351

ComBIN Loader

Peter Goodeve, University of California, Berkeley, California

An extended utility loader for BIN and RIM tapes, with all standard BIN load features, switch-controlled autostart in any memory field and automatic selection of input device. It may be located on any page of any field, and always protects its own page from accidental overwriting during loading. ComBIN is supplied as a punched tape in a special format read by a 9-instruction initial loader. The same tape can be used to place ComBIN on any page in core.

Minimum Hardware:	4K PDP-8, teletype or high speed reader
Storage Requirement:	120_{10} locations on any page in any field
Source Language:	PAL

DECUS NO. 8-352

Parity Hi-Lo Loader

Ronald Zane, University of Hawaii, Honolulu, Hawaii

Loads parity format punched paper tapes from either a high speed reader or the ASR33 teletype. It must be started on leader (8-level punch) and will halt on trailer (8-level punch). If a parity error is encountered the loader will halt with the erroneous character in the reader. SRØ (Ø) ⇒ High speed reader and SRØ(1) ⇒ ASR33.

Minimum Hardware:	4K PDP-8, ASR33 or High Speed reader
Storage Requirement:	70 locations (7400-7505)
Source Language:	PAL III

DECUS NO. 8-353

Disk Monitor Patch for BLACKJACK (DECUS NO. 8-94A)

Carl Kishline, University of Wisconsin, Parkside Computing Center, Kenosha, Wisconsin

The Disk Monitor Patch allows the BLACKJACK user to decide whether he wishes to start over after a Ø wager. An "N" response to "another victim?" returns control to 76ØØ, the head of the monitor. Any other response returns control to Ø2ØØ, the start of BLACKJACK. A system without a monitor could use this by changing location 3762 (the JMP I MON) to 74Ø2 (HLT).

Minimum Hardware:	4K PDP-8, DF32 Disk
Other Programs Needed:	Disk Monitor System, BLACKJACK (DECUS NO. 8-94A)
Storage Requirement:	41_{10} or 50_8
Source Language:	PAL-D

DECUS NO. 8-354

Pass 3 ASR33 Format Overlay

Frank Melchior, Jr., National Center for Atmospheric Research, Boulder, Colorado

This overlay will automatically format the output from Pass 3 on the ASR33 teletype into page size blocks.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	PAL III (Digital-8-3L-5)
Storage Requirement:	33 locations
Restrictions:	High speed punch will NOT work with this program
Miscellaneous:	Symbol table will have to be punched on Pass 1
Source Language:	PAL III

DECUS NO. 8-355

PAL III.75

E. D. Huthnance, Newberry College, Newberry, South Carolina

This overlay to PAL III will enable it to generate links for off page references automatically, in a manner similar to MACRO-8.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7100 to 7447
Restrictions:	Only low speed input and output may be used
Source Language:	PAL III

DECUS NO. 8-356

Page Printer

G. Kermez and W. Peters, Texas Instruments Limited, Bedford, England

This program is designed to produce pages of a required length from ASCII paper tape fed from either the low speed or high speed readers.

Minimum Hardware:	4K PDP-8/L, ASR33
Restrictions:	Tape to be read must be set at first character
Miscellaneous:	Set switch register to 1 to run program

DECUS NO. 8-357

ISOMER - Interactive Study of Organic Molecules by Educational Reinforcement

Dr. James W. Cooper, Digital Equipment Corporation, Maynard, Massachusetts

ISOMER was written to establish the utility of the LAB-8 as a tool for computer-assisted instruction. It is designed to assist students in learning organic nomenclature by asking them to identify all 21 isomers of $C_5H_{10}Br_2$. Carbon skeletons are drawn on the scope by typing C's and the positions of the BR's are controlled by the LAB-8 knobs. After the bromines are adjusted to represent a legitimate isomer, typing N produces the IUPAC name on the Teletype. The program also informs the student if he has entered this compound before, and when he is done, lists any isomers that he omitted.

Minimum Hardware:	LAB-8/L or 8/I with 4K of core and Teletype, LAB-8 Scope
Storage Requirement:	0-5377
Source Language:	Can be assembled by MACRO-8, PAL-D, PAL-8 or PAL-10

DECUS NO. 8-358

Card Reader Patch

Peter Lincoln Barnett, Dubner Computer Systems, New York, New York

This patch may be used to modify a program which uses the teletype or paper tape to use a card reader. It is used as a subroutine which supplies a character each time it is called. The card is buffered and the BCD codes are converted to ASCII.

Minimum Hardware:	PDP-8/I with CR03 card reader
Storage Requirement:	260_8 locations
Source Language:	PAL

DECUS NO. 8-359

Hi-Q Game Playing Program

M. L. Fichtenbaum and R. E. Peterson, General Radio Company, Concord, Massachusetts

Hi-Q is a game played with pegs on a board. This program plays Hi-Q and finds solutions by means of a tree of possible move patterns. Several different printouts are available, selected by the switch register.

Minimum Hardware:	4K PDP-8 and Teletype
Source Language:	GR's PDP-8/1130 Assembly, similar to PAL III

DECUS NO. 8-360

ASCII to Friden (EIA)

Arnold V. Fish, Digital Equipment Corporation, Parsippany, New Jersey

This program converts from ASCII to Friden (EIA) using a restricted character list. It provides for operation with or without illegal character halts, but in either case output can continue with illegal character ignored. High or low speed paper tape equipment can be used.

Minimum Hardware:	4K PDP-8
Restrictions:	Converts only unique EIA characters
Source Language:	PAL-D

DECUS NO. 8-361

Game of Chance

Randall S. Battat, San Francisco, California

Similar to a dice game, but a little harder to win. Written in BASIC for use on the PDP-8

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	POLY-BASIC (DECUS NO. 8-195)
Source Language:	BASIC

DECUS NO. 8-362

IOFMAG

Giles Peterson
Submitted by: Ernest Hayden, Speech Communications Research Laboratory, Santa Barbara, California

Four subroutines are provided which access DECtapes on TC-01 drives. In contrast to the routines provided by DEC, these routines do not use the interrupt. If the user does not require the use of the interrupt while doing DECtape I/O, the use of these routines has several advantages:

1) They occupy less storage (106 [10] vs. 128 [10] words); 2) The user need not establish page Ø linkages to service the interrupt; 3) Other devices (such as the teletype) will not interrupt the DECtape I/O. When, for instance, transferring from paper tape to DECtape, one need not buffer those characters which would have been read during DECtape output.

Minimum Hardware:	4K PDP-8, TCØ1 DECtape Drive
Storage Requirement:	106_{10} words
Source Language:	PAL III

DECUS NO. 8-363

DATOUT: A Simple Routine for Printing Sequential Data as an Array

Barry Millman, University of Calgary, Calgary, Alberta, Canada

DATOUT is a routine which enables octal numbers stored sequentially in the PDP-8 to be output as single precision positive decimal integers with up to 14 numbers per line and up to 4096 lines. Provision is made for automatic numbering of typed lines. Digital's Unsigned Decimal Print is required to convert and print the numbers.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	Digital's Unsigned Decimal Print 8-22-U
Source Language:	PAL III

DECUS NO. 8-364

Extended Memory Patch to the 3-Word Floating Point Arithmetic Interpreter

Herbert Poppe, Lamont Geological Observatory of Columbia University, Palisades, New York

This patch allows the 3-word Floating Point Arithmetic Interpreter (DEC-Ø8-YQYB) to reside in any memory field and to be entered from that field or any other memory field.

Minimum Hardware:	PDP-8, extended memory, memory extension control
Other Programs Needed:	DEC-Ø8-YQYB
Restrictions:	Does not work with previous version (DEC-Ø8-YQYA)
Source Language:	PAL-D

DECUS NO. 8-365

CARD

Herbert Poppe, Lamont Geological Observatory of Columbia University, Palisades, New York

Reads cards from a card reader and transfers the characters to DECtape as an ASCII file compatible with Disk/DECtape Monitor System. The program runs with the interrupt enabled. CARD, in effect, allows card input to the PAL-D Assembler, for example.

Minimum Hardware:	4K PDP-8, 1 DECtape Drive and Control, Card Reader (CR01, 2, 3 or CR8I/L) and Control
Other Programs Needed:	Disk/DECtape Monitor System (DEC-D8-SDAB)
Storage Requirement:	Program: ØØØØ-1577; Buffers: 2ØØØ-3ØØ1, 4ØØØ-54Ø5
Restrictions:	Ignores card columns 61-80
Source Language:	PAL-D

DECUS NO. 8-366

Modified Readable Punch

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

This program is similar in many respects to DECUS NOs. 8-68a and 8-106. It allows the user to type any characters whose ASCII code is 240 to 337, and produce an 8 X 6 matrix readable outline of the character on tape. The added features are: (a) new 6 words per character tags, and (b) there are provisions for output devices selection.

Minimum Hardware:	4K PDP-8, ASR33, HSP
Storage Requirement:	Locations 20-43; 200-310 (SA=200); and 400-1177 for Tags
Source Language:	PAL III

DECUS NO. 8-367

Digital 8-12-U Modified

Judson Gilbert, Florida State University, Tallahassee, Florida

The changes indicated allow the routine to recognize numbers in the range of ± 2047 instead of from 0 to 4095. As is usual with all software, making it more powerful takes a little more core or, eliminates some features or both. In this instance, the calling program will have to decide about initializing or plotting, and when plotting the pen will have to be raised or lowered, or commanded so, regardless of its up or down status of entry. The storage required is still 1 PDP-8 page.

This version of Digital-8-12-U is now serving us as an FNEW addition to FOCAL. It does a very nice job.

Minimum Hardware:	PDP-8, LINC-8 and incremental plotter
Other Programs Needed:	Calling program
Source Language:	LAP6-DIAL

DECUS NO. 8-368

Tri-Data CartriFile PAL III Assembler

Jack R. Ellis, Tri-Data Corporation, Mountain View, California

This is a complete rewrite of the basic PDP-8 PAL III Assembler. In addition to providing magnetic tape source-program input and listing output on the Tri-Data CartriFile, the program provides for 11" paging, line numbering corresponding to the "pages" of the DEC Editor, a 4-column symbol table, and compressed source-tape formatting. Symbol table capacity is 532 symbols.

Minimum Hardware:	4K PDP-8, ASR33 (HSR/P and/or Cartrifile are optional)
Storage Requirement:	4096 words ($0-7577_8$)
Restrictions:	Binary output tapes may not be used with DDT-8
Source Language:	PAL III

DECUS NO. 8-369

Tri-Data CartriFile DEC Editor

Jack R. Ellis, Tri-Data Corporation, Mountain View, California

This is an overlay to the DEC Editor which provides for magnetic-tape text input-output using the Tri-Data CartriFile. New switch options provide the user with the ability to use the Teletype, High Speed Punch or Cartri-File as I/O devices. In all other respects, the DEC Editor remains unchanged.

Minimum Hardware:	4K PDP-8, ASR33, (HSR/P and/or CartriFile are optional)
Storage Requirement:	4096 words ($0-7577_8$)
Source Language:	PAL III

DECUS NO. 8-370A

FBUILD

Bruce L. Taylor, L. L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, North Carolina

FBUILD builds LIBRA-FOCAL systems on DECtape for save-restore features outlined in DISK utility program.

Minimum Hardware:	8K PDP-8; 1 DF32 or RF08; TC01 DECtape; 1 TU55 Transport; EAE
Other Programs Needed:	LIBRA, FOCAL, Extensions to LIBRA-FOCAL (DECUS NO. 8-433)
Storage Requirement:	0000-2177; SA=2000
Miscellaneous:	Need write-up for DISK (DECUS NO. 8-370B)
Source Language:	PAL-8 with conditional assemblies

DECUS NO. 8-370B

DISK

L. Gordon, R. A. Helwig, M. Conrad, B. Taylor, L. L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, North Carolina

Maintains disk images in save-restore form on DECtape. Starting bootstrap for monitor systems: 4K Disk Monitor (Disk and tape); PS/8 (Disk and tape); TC01 Library System; LIBRA-FOCAL. Restores Binary and RIM loaders in 17600-17777; Special Disk image builder.

Minimum Hardware:	8K PDP-8; 64K DF32, EAE, TC01 DECtape, 1 TU55 Transport
Storage Requirement:	0000-1777 SA=200
Source Language:	PAL-8 with conditional assemblies

DECUS NO. 8-371

Teletype Control of ND 50/50 Memory Unit (TYPED)

W. J. Blanchard, Louisiana State University, Baton Rouge, Louisiana

TYPED is a program to allow the user quick access to Nuclear Data's 50/50 Memory and Display unit via the ASR33 teletype. After entry through the monitor, the user types in the starting channel (1-4096) and the program echoes the contents which are then subject to modification. The program contains two control characters, one in case of error made in typing channel contents, the other is a terminal character which returns control to the monitor routine.

Minimum Hardware:	4K PDP-8 with Nuclear Data 50/50 interface system
Other Programs Needed:	Nuclear Data's Basic Software Package
Storage Requirement:	(115_8)
Source Language:	PAL III

DECUS NO. 8-372

ML Editor (Machine Language Editor)

Nobuhiro Sato, Rikei Corporation, Rikei Computer Center, Tokyo, Japan

This is an extension of the program GOOF (DECUS NO. 8-97). It is capable of printout, binary punchout, insert, swap and zero-clear of instructions and data in the core memory. It will enable the user to change instructions and data in core memory in case of debugging and gets the binary punched tape. All commands are via TTY.

Minimum Hardware:	4K PDP-8, ASR33, HSP
Storage Requirement:	7200-7577; Binary Punchout Routine 7040-7177
Source Language:	PAL-D, MACRO-8

DECUS NO. 8-373

LISP Disk Array

Gary Coleman, Case-Western Reserve University, Cleveland, Ohio

This program allows the user to store up to 4096 individual numbers on disk. Storage is by a one-dimensional array. The function is accessed by EXPR. Both the READ and WRITE routines sit in the top of core, just under the monitor, and occupy only 26_{10} locations (13 LISP cells). The function is similar to FOCAL'S FNEW for disk.

Minimum Hardware:	PDP-8 with 1 DF32 Disk
Other Programs Needed:	LISP Interpreter for the PDP-8 (DECUS NO. 8-102a)
Source Language:	PAL-D

DECUS NO. 8-374

Binary or RIM Consolidator

Garth Peterson, South Dakota School of Mines and Technology, Rapid City, South Dakota

The Binary or RIM Consolidator program accepts input paper tapes in either binary or RIM format and punches them back out in binary format, in RIM format, or in a special RIM format compatible with the binary loader. Multiple input tapes, not necessarily all in the same format, may be combined into one output tape. Format conversions between binary and RIM may be made in either direction. The interrupt facility is used for efficiency.

Other Programs Needed:	0-777
Source Language:	PAL-D

DECUS NO. 8-375A

3 Page Floating Point Package

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This package makes available an alternative to the lengthy floating point package distributed by DEC and also utilizes the concept of cutting down exponent size to allow a larger mantissa. It uses 3 word numbers, with 27 bit mantissa and 8 bit exponent.

Minimum Hardware:	4K PDP-8
Storage Requirement:	Locations 50-64, 5410-6177
Source Language:	PAL 1Ø, Version 141

DECUS NO. 8-375B

3 Page Floating Point Package with Floating Output

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This package is the same as the three page floating point package, except that a floating point output routine has been added.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	50-64, 5400-6177 for arithmetic routines; 6200-6377, 6400-6501, 6566-6577 for floating output
Source Language:	PAL 1Ø, Version 141

DECUS NO. 8-376A

Field 1 Symbol Table Storage for PALD (DEC-D8-ASAA-LA)

Peter F. Calder, Weapons Research Establishment, Adelaide, South Australia

Instead of storing external symbols on the system device (in .SYM), this modification allows Field 1 to be used for this purpose, reducing assembly and listing time by (typically) 50%. 20 blocks of external symbols are provided for.

Minimum Hardware:	8K PDP-8, Disk or DECtape
Other Programs Needed:	PALD Assembler (DEC-D8-ASAA-LA)
Storage Requirement:	Field Ø, same as PALD; Field 1, pages 1-20
Source Language:	PAL

DECUS NO. 8-376B

Field 1 Symbol Table Storage for PALD (DEC-D8-ASAC-LA)

Peter F. Calder, Weapons Research Establishment, Adelaide, South Australia

This overlay is for the later version of PALD (DEC-D8-ASAC-LA). The operation of the updated version is identical to the original.

Minimum Hardware:	8K PDP-8, Disk or DECtape System
Other Programs Needed:	PALD Assembler (DEC-D8-ASAC-LA)
Source Language:	PAL

DECUS NO. 8-377

One Pass Assembler

Barney Hordos III, University of California, Lawrence Radiation Laboratory, Berkeley, California

This program is for on-line use with PDP-8 series computers with 4K or greater core. The assembly is made directly into the memory of the computer, and a paper tape in RIM or BIN format may be punched. The op code field length is limited to three characters with indirect addressing available. It is not Source language compatible with other PDP-8 assemblers.

Minimum Hardware:	4K PDP-8
Storage Requirement:	3000-7063
Restrictions:	Can write over itself, not protected
Source Language:	Not compatible with other PDP-8 assemblers

DECUS NO. 8-378

Map Directory Information on KV8/I

Elmer J. Bourque, RPC Electronics Department, New Brunswick Research and Productivity Council, Fredericton, New Brunswick, Canada

KV8Map gives the operator a complete picture of the TCØ1 DECtape Library System Directory including file name, starting block on tape, number of blocks in file, starting address of the program and a complete description of the core locations used by each file.

Minimum Hardware:	Teletype, TCØ1 with at least one TU55; KV8/I Display
Other Programs Needed:	TCØ1 DECtape Library System
Storage Requirement:	6ØØØ - 7577
Source Language:	PAL III

DECUS NO. 8-379a

Double Precision and Floating Point Interchanger

Stephen J. Freeland and F. Jakob, Sacramento State College, Sacramento, California

This is a subroutine for conversion of double precision to floating point format and vice-versa. A routine to move the radix point in a double precision number to any location is also included as a separate subroutine. The listing for these routines is not included with the write-up, but can be generated from the source tapes. However, a small program is included which was written to prove this version of the ROTATE subroutine

Minimum Hardware:	PDP-8
Other Programs Needed:	DEC Floating Point Package No. 1
Storage Requirement:	Location 170-175 and 5240 to 5576
Source Language:	PAL III

DECUS NO. 8-380

WATSNU

P. C. Halsall
Submitted by: L. A. Cragg, Teklogix Ltd., Mississauga, Ontario, Canada

WATSNU has two purposes: to compare current core store and a binary tape without changing core; and to reload a binary tape and illustrate locations which are changed in the process. It is used during debugging to highlight differences between current program status and the last binary program tape; and also in the event that a system failure requires a program reload in order to provide a trace of conditions at the time of failure.

Minimum Hardware:	4K PDP-8, ASR33, (high speed reader optional)
Storage Requirement:	1 page
Source Language:	MACRO-8

DECUS NO. 8-381

Cardreader Subroutine for Disk Editor

Herbert Steiger, Medical Institute fur Lufthygiene, Duesseldorf, Germany

The program allows for the use of a cardreader as input with the editor. The high speed reader is replaced by the cardreader. All other input and output equipment can be used without any changes.

After every card a CR is produced to end the line. The read-in is terminated by a CTRL/FORM, when 40 cards have been read. By doing this the overflow of the textbuffer is avoided and there is room for possible changes.

Minimum Hardware:	8K PDP-8/I, ASR33, DF32 RF08, TC01, TU55, CR8/I
Other Programs Needed:	Disk Monitor System, Disk Editor (DEC-D8-ESAB)
Storage Requirement:	214_8 locations in Field 1. Subroutine will be in Field 0 on input
Miscellaneous:	Can also be written for 4K
Source Language:	PAL-D

DECUS NO. 8-382

Readable High Speed Punch Copier

Nigel D. Chubbb, Collins Radio Company of United Kingdom, Limited, Hounslow, Middlesex, United Kingdom

This program accepts alphanumeric characters from teletype and outputs them in a readable form on a high speed punch. On depression of ALTMODE key, a copy is made of tape placed in high speed reader.

Minimum Hardware:	Basic PDP-8 with high speed reader and punch, ASR33
Storage Requirement:	3 pages +
Source Language:	PAL III

DECUS NO. 8-383A

Scan and Analysis Program

A. M. Romaya, University of Oxford, Department of Nuclear Physics, Oxford, United Kingdom

The program is an investigation of the possibility of using a graphic display for a highly efficient method of inputting graphic data. It is divided into two parts. The first part scans the graphic data set as rectangular shaped elements or routings on a transparency. A digitized image of the transparency is obtained and displayed. This image is then analyzed by the second part to obtain the desired symbols or routings.

Minimum Hardware:	Basic PDP-8 with 338 Display

DECUS NO. 8-383B

Core Display Program

A. M. Romaya, University of Oxford, Department of Physics, Oxford, United Kingdom

This program allows the user to display, change, dump and punch the contents of any core location by commands initiated from the 338 display light pen and push buttons. The program occupies locations 5ØØØ-734Ø of memory field one. The program does not set the push down pointer or the interrupt system and hence field Ø is absolutely free for use by other programs. It is possible to run this program concurrently with another which uses the interrupt system. (This second program should not use the display unless in special modified cases.)

Minimum Hardware: Basic PDP-8 with 338 Display

DECUS NO. 8-383C

Drawing Applications Program

A. M. Romaya, University of Oxford, Department of Physics, Oxford, United Kingdom

This program is intended to show the facilities the DEC-338 system offers when considered as a drawing board. It allows the user to: draw straight lines of "free hand" over a total of 75 X 75 inch area; include symbols which may be formed by means of the program; label the drawing in alphanumeric and other characters; delete items drawn; output the display and symbol files created and input a display file and its symbols for updating. The program incorporates a tracking cross and raster and the coordinates of the tracking are shown when required. Control is obtained by a set of light buttons and push buttons and the switch register.

The documentation gives possible core location changes for adapting the dimensions drawn to special cases if required.

Minimum Hardware: Basic PDP-8 with 338 Display

DECUS NO. 8-384

BLOK

T. D. M. Roberts, Institute of Physiology, University of Glasgow, Glasgow, Scotland

This is a two-page program used under Monitor for examining the state of the disk. Blocks are printed out on the teletype with their link words, either in Directory format with the file names decoded, or in an octal array format. The number of the block to be examined may be entered either from the SR or from the teletype using ODT.

Minimum Hardware:	PDP-8, ASR33, DF32
Other Programs Needed:	DEC Monitor System, ODT at 4000 (optional)
Storage Requirement:	6000-6377
Source Language:	PAL-D

DECUS NO. 8-385

Mixed ASCII Formatting and Outputting Technique

Donald L. Scanlon, Romelan Industries, Santa Clara, California

This technique provides a reasonably good tradeoff between storage requirements and execution time in real-time systems when a number of fixed and variable field messages must be output. The technique uses unpacked standard ASCII code for variable data and packed, modified ASCII for fixed data. The two formats may be mixed and are easily detected and processed by an interrupt routine.

Source Language: PAL III

DECUS NO. 8-386

Multiple Field Loader

Randall S. Battat, 55 San Rafael Way, San Francisco, California

The Multiple Field Loader is used to load paper tapes punched in BIN format into more than one field of core memory. It will also change the field when program is running. It is useful when a very long program is encountered.

Minimum Hardware:	8K PDP-8
Storage Requirement:	106_8 locations
Source Language:	PAL III

DECUS NO. 8-387

Grade Point Correlation

E. D. Huthnance, Newberry College, Newberry, South Carolina

This package of programs calculates correlation matrices for p samplings of a real variable (e.g. student grade point ratios) with n Boolean variables (e.g. subjects taken). The programs can also correlate combinations of the n variables taken m at a time with the real variable. Included in the package are a versatile data tape editor which can be used to prepare an input data tape for the correlator and a program which converts the output of the correlator into percentage correlation matricies.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFC1-PB and DEC-08-AFC3-PB)
Source Language:	FORTRAN and PAL III

DECUS NO. 8-388

CALENDAR

R. Lee, University of Kent at Canterbury, Canterbury, Kent, England

This program will print the calendar for any year between 1

DECUS NO. 8-388 (Continued)

A.D. and 9999 A.D. inclusive. The Julian calendar is used before 1752 and the Gregorian calendar after 1752. Output is on the Teletype or high speed punch

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	20-60, 200-1537
Source Language:	PAL III

DECUS NO. 8-389

Mini-Monitor, A Secondary Disk Monitor for the PDP-8

R. S. Lewis, Science Research Council, Rutherford Laboratory, Chilton, Didcot, Berkshire, England

The program allows large numbers of core images to be saved on disk by name, but independent of the DEC Monitor. The restrictions normally imposed by the limit on the number of file names available are thus avoided.

Minimum Hardware:	4K PDP-8, DF32 Disk
Other Programs Needed:	DEC Monitor SYSIO Head
Storage Requirement:	3 contiguous pages of core
Restrictions:	Only contiguous saves available. No swapping-out of core
Source Language:	PAL-D

DECUS NO. 8-390

PALEDCO (PAL Assembler and Editor Combined)

Paul Fingerman, Department of Psychology, State University of New York at Stony Brook, Stony Brook, New York

PALEDCO is a combined editor and assembler, based on Symbolic Editor (DEC-Ø8-ESAB-PB) and PAL III Assembler (DEC-Ø8-ASB1-PB). It allows the user with an 8K machine to enter PAL III language programs on-line using the editor, edit them, and then to assemble them from the text image in core, without the intervening paper tape step previously required. If an error diagnostic should occur during assembly, he has immediate access to the editor and his incorrect text, so that "instant" editing and reassembly is possible. "Instant" editing and higher assembly speed are the two primary advantages of this system over existing ones. In addition, the editor's text storage area has been expanded by 1Ø3Ø (octal) locations. Finally, all editor and assembler options which were available in the DEC programs have been retained, and Bin loader in lower core is not destroyed, advantages over earlier programs of this sort.

Minimum Hardware:	8K PDP-8, ASR33 (High Speed Reader and Punch optional)
Other Programs Needed:	BIN Loader
Source Language:	PAL III

DECUS NO. 8-391a

7 or 9-Track MTA for PS/8 with TC58/TU-20

Roger Seeman, The Boeing Company, Seattle, Washington

This is a revision and correction of the original program written by John Alderman. It is a single unit Magtape handler for use with the PS/8 system. Each tape must be formatted (see DECUS NO. FOCAL8-125a) before use. Tapes will have a directory and otherwise resemble DECtape in storage operations. REWIND is invoked when directory block is searched for.

Minimum Hardware:	PS/8 system configuration with Magtape
Storage Requirement:	1 page
Source Language:	PAL 8

DECUS NO. 8-392

Vector-8

Richard Rothman, Groton School, Groton, Massachusetts

Vector-8, a new programming language, is designed to allow the user of a PDP-8 with 8K and a DF32 Disk to take full advantage of the hardware. It offers 33 functions, 15 operators and 22 commands.

Minimum Hardware:	8K PDP-8, DF32 Disk
Source Language:	PAL-1Ø

DECUS NO. 8-393

Queing TCØ1/TU55 DECtape Routines

James Crapuchettes, Stanford Electronics Labs, Stanford, California

These routines, which are a much modified version of DEC-08-FUBO (previously DEC-08-31U) provide the user with the ability to read and write 128 words (one memory page) from/onto standard 129 word DECtape blocks. Successive blocks are transferred into/from successive 128 word areas of memory. The routines will transfer into/from any memory field, will begin searching in either forward or reverse direction for the block at which the transfer will begin, and will queue one read/write request to keep the DECtape in motion (and transferring data) as continuously as possible.

Minimum Hardware:	PDP-8, TC01 DECtape control and TU55 DECtape transport(s)
Storage Requirement:	About 1 1/4 pages of memory (240_8 locations)
Source Language:	PAL III

DECUS NO. 8-394

BASIC MOO

Guy Steele, Jr., Brighton, Massachusetts

MOO is a game of deductive strategy which is complex enough to challenge expert logicians, yet simple enough for a fourth-grader to learn. MOO also improves the deductive faculties of the player, and is recommended for use in schools.

Minimum Hardware:	Any standard BASIC system; computer or teletype
Other Programs Needed:	BASIC
Source Language:	BASIC

DECUS NO. 8-395

Space War

Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

The classic game of Intergalactic Death and Destruction on a LAB-8. Two players vie with ships in space for control of the Universe. The ships may be controlled from the Switch Register or from the AXØ8 front panel Blue Ribbon Connector.

Minimum Hardware:	4K LAB-8 or LAB-8/L, ASR33
Storage Requirement:	25ØØ words
Source Language:	PAL

DECUS NO. 8-396

MTS-6/70 (Millisecond Time-Sharing System)

Charles W. Snyder, Department of Psychology, University of Notre Dame, Notre Dame, Indiana

A laboratory time-sharing system for data processing and control of up to 18 experiments without interaction. Experiment programs in PAL III are called at 1, 10 or 100 Hz for one millisecond per share. Inputs may be sampled at 1000 Hz. The basic system of about 1400 core words includes a scope interactive display, I/O, arithmetic, conversion, keyboard control, and service routines most useful in behavioral research.

Minimum Hardware:	4K PDP-8/I, ASR33, AXØ8 with scope, XR, XM, XC options to 16 analog channels (LAB-8 system), PCØ8 High Speed Reader and Punch
Storage Requirement:	11_{10} pages: Ø2ØØ-Ø377, 52ØØ-7611, plus half of Page Ø
Restrictions:	Experiment programs are not on interrupt and must return within 1 msec.
Source Language:	PAL III

DECUS NO. 8-397

8K Editor

Bill Donelson, The Choate School, Wallingford, Connecticut

This editor was designed to be used with a DF32, but can be used without it as explained in the documentation. The editor contains 30 commands, many of which can use multi-letter search strings. I/O for disk has been greatly improved (Input and Output filenames may be the same !) and Reader/Punch are always enabled. (High Speed)

Minimum Hardware:	8K PDP-8; DF32 and high speed paper tape recommended
Other Programs Needed:	"AF" version of Disk Monitor if Disk I/O is used
Storage Requirement:	[Ø-3777] field Ø (20_8 blocks on disk)
Restrictions:	Will not run with 2 disks. Does not recognize second SAM block
Source Language:	PAL-D

DECUS NO. 8-398

IMAGE

John Alderman, Applied Data Research, Atlanta, Georgia

IMAGE, a program to convert PS/8 'SAVE'd files to binary format, translates a SAVEd file and produces a binary output file, which may then be reloaded using any of the binary loaders of the PDP-8 family. It is useful when the only copy of a working program is on a saved file, or for transmission via paper tape to other installations.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	2000-4400; 16600-17577; 2000-6003
Source Language:	PAL-8

DECUS NO. 8-399

8K FORTRAN Bit Manipulation Subroutines

Michael J. Allen, Lawrence Radiation Laboratory, Livermore, California

Two closed subroutines which may be used by the FORTRAN programmer for bit manipulations. One page of core and EAE are required by each subroutine.

LBYT function subroutine will load a byte of any size into the processor AC, right-adjusted.

SBYT subroutine will insert a byte of any size into a specified integer.

Minimum Hardware:	8K PDP-8, EAE
Source Language:	SABR

DECUS NO. 8-400a

Execute Slow

Gary G. Barrett, General Motors Styling Staff, Warren, Michigan
Revised by: G. A. Moyle, University of New South Wales, Australia

Execute Slow will execute the user's program one instruction at a time. Before the instruction is executed the LINK, ACCUMULATOR, PROGRAM COUNTER and INSTRUCTION are printed on the ASR33. The program only occupies one page and differs from most trace programs in that user instructions are actually executed from the user's original location. Subroutine tracing can be turned off.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	Locations 0000 through 0003 in field zero and 6600-6777 (1 page) in any field
Restrictions:	User interrupts may not be used and the 6002 instruction not allowed. Instructions with an effective address of .-1 may cause incorrect execution of traced program
Source Language:	MACRO-8

DECUS NO. 8-401

Dice Game and TIC-TAC-TOE

Lyle Kline, Inglemoor High School, Bethell, Washington

Dice Game simulates a craps table and allows one player to make fictitious bets and roll the dice. Full playing instructions are given by the program when it is run on-line with the BASIC Compiler.

Tic-Tac-Toe is an excellent demonstration program. It is possible to beat the computer for once.

Other Programs Needed:	BASIC Compiler
Source Language:	BASIC

DECUS NO. 8-402

Resequence

Howard Wolfington, Department of Defense Computer Institute, Washington Navy Yard, Washington, D. C.
Submitted by: W. Kieswetter, Digital Equipment Corporation, Washington, D. C.

This routine will resequence line numbers (and references) within a BASIC program on the TSS-8.

Minimum Hardware:	TSS-8
Other Programs Needed:	BASIC Compiler
Storage Requirement:	0-4K
Source Language:	PAL-D

DECUS NO. 8-403

Stereo - A 2 Channel Music Program

Maurice Retter, University of Oxford, Oxford, England

A musical program, written for the PDP-8, which can control two loudspeakers independently. A frequency is produced by creating a square wave pulse train, where each pulse is generated by an IOT instruction, and the time delay between pulses is under program control. Two channels are made available, if required, by using two IOP pulses from one IOT instruction to activate independent loudspeakers. The program is divided into a coding section, and a decoding section and play routine.

Minimum Hardware:	4K PDP-8, two R3Ø2's, two amplifiers and speakers
Source Language:	PAL III

DECUS NO. 8-404

Octal MEM Dump - Extended Memory

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

This program's major objective is similar to Digital-8-6-U, to dump memory contents on the teletype. Included or revised are: 1) a CDF instruction; 2) heading routine; 3) ten spaces tab routine and 4) each line begins with an absolute address followed by the first eight words. This process repeats until block is exhausted.

Minimum Hardware:	4K PDP-8, Extended Memory, ASR33
Source Language:	PAL III

DECUS NO. 8-405

SOOT

S. de Vries and C. C. Westphal, Royal Dutch Blastfurnaces and Steelworks, Ymuiden, Holland

This program will execute PDP-8 programs under full operator control. SOOT is a debugger of the interpretive type. It can handle all instructions, including those for extended memory, with the exception of 2 word EAE instructions. It can also handle program interrupts.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	4 pages
Source Language:	PAL

DECUS NO. 8-406

STATPAC Revisions for PDP-8/I and TSS/8

Dartmouth College - Revisions by Berkshire Community College
Submitted by: Roger W. Strickland, Berkshire Community College, Pittsfield, Massachusetts

This package contains 11 programs from the original PDP-10 Dartmouth BASIC Statistical Package which have been revised for the PDP-8/I and TSS/8. The documentation consists of a description and listing of each of the programs. The DECtape which is available is a PDP-10 formatted symbolic tape.

Minimum Hardware:	PDP-8/T
Other Programs Needed:	BASIC
Restrictions:	Array sizes very restricted for TSS/8 BASIC
Source Language:	BASIC

DECUS NO. 8-407

Patch to Editor (DISK) DEC-D8-ESAD-PB

H. D. Schenk, Deutsche Forschungs-und Versuchsanstalt fur Luft und Raumfahrl, Flughafen, Germany

This patch corrects two errors found in EDIT-D Version ESAD. It allows the Editor to work with "Dn :name" as input or output device for the source file.

Minimum Hardware:	4K PDP-8, Disk or TCØ1
Other Programs Needed:	EDIT-D DEC-D8-ESAD-PB
Source Language:	PAL-D

DECUS NO. 8-408

Disk Utility Program

P. Galen Lenhert and Douglas Henry, Vanderbilt University, Nashville, Tennessee

Used for disk backups and file storage. All types of files (ASCII, USER, etc.) can be punched by entering the file name or disk block numbers. Files saved by name are restored to any free area on the disk. Program also lists the file directory and erases files. Checksums are provided. Program design and documentation should allow modification to use reader/punches and magnetic tape without great difficulty.

Minimum Hardware:	4K PDP-8, ASR33, one DF-32
Storage Requirement:	Program: 0-2177; Working storage: 3000-7577
Restrictions:	I/O Limited
Source Language:	PAL-D

DECUS NO. 8-409

Card Loader

Peter Barnett, Dubner Computer Systems, New York, New York

With this package, programs may be loaded into the computer from punched cards rather than from paper tape. This is especially convenient for computers not having a high speed paper tape reader. Two programs are provided. The first is a loader using the CR8/I card reader. The second converts binary programs to the proper format for use with the above.

Minimum Hardware:	PDP-8/I, CR8/I card reader
Storage Requirement:	80 core locations for loader, 4K for converter
Source Language:	PAL

DECUS NO. 8-410

Pseudo-Random Number Generator, EAE Version

W. Madeline Webber
Submitted by: Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

This random number subroutine generates numbers identical to those produced by DECUS programs Nos. 5-25 and L-64. Use of EAE greatly speeds execution time.

Minimum Hardware:	PDP-8/12, LINC-8 with EAE
Miscellaneous:	(Also L-114)
Source Language:	PAL-D

DECUS NO. 8-411

Mongoose Display System

Dale Lewellyn, Digital Equipment Corporation, Ann Arbor, Michigan

Mongoose is a set of two programs: Mongoose Sort and Mongoose Display. These programs are used in conjunction with the Lab-8 Advanced Averager and a grid of 16 analog inputs to produce an averaged, 3-D, topographical display surface corresponding to the voltages present at each of the inputs at a particular point in time. Such displays may be produced for each set of points in the signal epochs and are suitable for filming as frames in a motion picture showing the development of the averaged response present simultaneously over a wide area.

Minimum Hardware:	LAB-8 with 16 channels A/D and storage scope
Other Programs Needed:	Advanced Averager, Disk Monitor (optional)
Storage Requirement:	SORT: 10-44 and 7200-7504; Display: 7-177 and 3000-7577
Source Language:	Programs: PAL-D; Tables: MACRO-8

DECUS NO. 8-412

MRS X

F. C. Owen, General Railway Signal Company, Rochester, New York

MRS X is a debugging routine which will report on the teletype all program references to a given object address. A faulty program may be altering the content of a memory location when it is not desired. MRS X will find the instruction that is doing the altering. It is also useful to locate the users of constants, subroutines, etc.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	6600-6766 Page relocatable
Source Language:	PAL III

DECUS NO. 8-413

GROPE III/A and BINLOC

F. C. Owen, General Railway Signal Company, Rochester, New York

Octal machine language program editor and Binary Load-Compare. Combines the functions of several DEC utility routines plus some new features, such as sequential loading and block loading via keyboard and SEARCH. A special "HELP" Loader is furnished with the tapes.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7100-7777
Miscellaneous:	When ordering tapes, please specify whether Loader is needed for HSR or LSR
Source Language:	PAL III

DECUS NO. 8-414

LIST

F. S. Irani
Submitted by: Danny Harmon, Cognitronics Corporation, Mt. Kisko, New York

Lists the program name and the block numbers it occupies on DECtape. Also lists the numbers of the free blocks.

Minimum Hardware: 4K PDP-8, TC01/TU55
Storage Requirement: 0000 —> 3477 field Ø
Source Language: PAL

DECUS NO. 8-415

Multiple Unit DECtape Copier

Paul J. Bezeredi, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This program allows the user the advantage of copying more than one DECtape simultaneously while accessing the master DECtape only once, thus saving time when making multi-copies of a program DECtape.

Minimum Hardware: PDP-8, TCØ1 or TCØ8, 2 TU/55 transports or 1 TU 56 Dual transport
Storage Requirement: 0-777 Main Program; 1000-7100 Buffer Space
Restrictions: DECtape must be of standard format
Source Language: PAL

DECUS NO. 8-416b

Bibliographical Handling

J. F. Echallier, A. Laviron, F. Peronnet, P. Gerin, I.N.S.E.R.M., Lyon-Bron, France

This program makes it possible to store and to correct bibliographical data, from ASR33 to DECtape. It allows printout of references when given required characteristics. The program should prove useful wherever a great deal of data is to be stored, updated, and easily picked up.

A new version, dated June 1972, allows building of the bibliographical tape under PS/8 system.

Minimum Hardware: 4K PDP-8, ASR33, 2 DECtapes
Other Programs Needed: Disk Monitor System (DEC-D8-SBAF)
Source Language: PAL

DECUS NO. 8-417

XCORE

James Crapuchettes, Stanford Electronics Labs., Stanford University, Stanford, California

This program is used to help in the debugging and documentation of a program. It reads in absolute binary files and uses them to produce a memory allocation map which shows which locations were loaded (these are the locations which will be loaded by a binary loader when reading in these files). The allocation map is output on the teletype with a label when specified by the user.

Minimum Hardware: PDP-8, TC01/TU55 DECtapes
Other Programs Needed: DECUS NO. 8-64a (XSYSTEM)
Storage Requirement: All of field Ø for program and internal tables
Restrictions: Resides in field Ø, will map fields Ø through 3
Source Language: PAL III with TEXT pseudo-op

DECUS NO. 8-418A & B

VEKSEL and PAPT

Ronald Zane, Institute for Astronomy, Honolulu, Hawaii

VEKSEL is a subroutine to convert ASCII code to PTTC-8 code commonly used in IBM equipment. PAPT is a program which uses VEKSEL to convert ASCII punched paper tape to PTTC-8 punched paper tape.

Minimum Hardware: 4K PDP-8, ASR33
Storage Requirement: VEKSEL 200-377; PAPT 400-451
Source Language: PAL III

DECUS NO. 8-419

Nmr - Pulse for the Lab-8/I

Dr. James W. Cooper, Digital Equipment Corporation, Maynard, Massachusetts

Nmr-Pulse is designed for rapid data acquisition and Fourier transformation needed for pulsed nmr spectroscopy. It acquires 512 data points at rates from 34 μsec/point, and signal averages them. The Fourier transform is performed on command and a magnitude spectrum calculated.

Minimum Hardware: LAB-8/I or 8/L with 4K of core
Source Language: PAL 1Ø or MACRO-8

DECUS NO. 8-420

LOGSIM-8

Robert Stolarz, Princeton University, Princeton, New Jersey

LOGSIM-8 is an interactive digital logic simulation program for the simulation of combinational and sequential logic circuits at the gate level. The language is simple, and allows logical units such as flip-flops to be called as functions. The output consists of a table of the values of selected variables during each pass through the circuit description.

Minimum Hardware: 4K PDP-8, TTY

DECUS NO. 8-421

Chain Load

Claude J. Ortega, University of Chicago, Department of Medicine, Chicago, Illinois

This program supervises the loading from the systems device, of multiple field and/or multiple file system saved programs through the calling of a one page routine.

Minimum Hardware:	4K PDP-8, DECtape or disk, ASR33
Other Programs Needed:	4K Disk Monitor System, Version AF
Storage Requirement:	200-377 5600-5777
Source Language:	PS/8 PAL8

DECUS NO. 8-422

Binary Punch - Extended Memory II

James Vrancik, NASA, Lewis Research Center, Cleveland, Ohio

This program is an extension of Digital 8-5-U Binary Punch and DECUS NO. 8-142. It accommodates extended memory, punches data in blocks and does not punch consecutive halts. The write-up includes a short program to load the core with halts. The produced tapes can be loaded by Digital 8-2-U Binary Loader.

Minimum Hardware:	PDP-8, ASR33
Storage Requirement:	7600-7754
Source Language:	PAL III

DECUS NO. 8-423

Disk Editor With View for LAB-8

K. W. Ranatunga, University of Bristol, The Medical School, Bristol, England

Disk Editor (DEC-D8-ESAB-PB, 1968) has been modified slightly so that a 'V' (view) command made via the teletype is recognized. This command is like a 'L' (list) command except that the requested line of the text buffer is displayed on a CRO screen along with the 17 succeeding lines. Further, the reference numbers of these lines as given by the Editor are also displayed.

Minimum Hardware:	4K PDP-8/I, AXØ8 with option XR, Disk File (DF32)
Other Programs Needed:	Disk Editor (DEC-08-ESAB-PB)
Restrictions:	For each view command the corresponding display is issued only once, and thus the display should be stored on a storage CRO screen
Source Language:	PAL-D

DECUS NO. 8-424

Morse Code

C. Bumgardner and T. Bell
Submitted by: T. L. Drake, Clemson University, Clemson, South Carolina

This program accepts Morse code via a logic sense line in real-time and outputs the decoded message on the teleprinter. The pattern recognition algorithm in the program automatically adapts to the sending rate with the maximum reception rate of the computer being limited by the teleprinter to about 100 words per minute. The program classifies a key down condition as either a dot or a dash. The key up conditions are classified either as a space in a character, a space between characters, or a space between words. These pattern classifications permit each character to be decoded via a table look up.

Minimum Hardware:	4K PDP-8, Real-time Clock, Logic Sense Line
Miscellaneous:	Decoding algorithm does a better job when code is generated by an electronic keyer
Source Language:	XPAL, PAL III

DECUS NO. 8-425

Block-Modify for PS/8

Rudi Stange, Digital Equipment GmbH, Munich, Germany

This program is similar to the BLOCK-MODIFY for the Disk Monitor System, but uses the PS/8 DECtape Handler. It also can be changed to use any other PS/8 handler. It allows typeout of contents of any block (DECtape or Disk) and permits changes to any location in the specified block.

Minimum Hardware:	8K PDP-8, TC01 or DF32 or other Disk
Other Programs Needed:	PS/8 System
Storage Requirement:	4000-4577, page Ø as Buffer and LOC; 3000-3577 for PS/8 Handler storage
Source Language:	PAL 8

DECUS NO. 8-426

Prime Number Generator

Anonymous

This is a short, simple program to output prime numbers. No write-up - tape only.

Source Language:	BASIC

DECUS NO. 8-427b

MEMO III - A Text Formatting Program

Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

MEMO III is a program written for the OS/8 system to produce paged text with margins from free form text. The intention is to permit the user to produce a readable and neatly formatted copy of text with minimal effort.

MEMO III is a descendant of [illegible] Ruth's original program. This version permits output [illegible] OS/8 compatible output device, rather than restricting [illegible] to the teletype. Files written for MEMO and MEM[illegible] compatible with MEMO III.

WITHDRAWN

Minimum Hardware: PDP-8/12, ASR33 (or equivalent) and either DECtape or Disk
Other Programs Needed: OS/8 Programming System
Miscellaneous: Same program is available on LINCtape as DECUS NO. 12-100
Source Language: PAL-8

DECUS NO. 8-428A

EAE - Modification to DECUS NO. 8-143, FFTS-R

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-143 FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-428B

EAE - Modification to DECUS NO. 8-144, FFTS-C

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-144 FFTS-C - A Fast Fourier Transform Subroutine for Complex Data, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-429

Intercorrelation 37

Gernot D. Kleiter and Ludwig R. Krysl, Psychologisches Institut der Universitat Salzburg, Salzburg, Austria

This program computes up to 630 intercorrelations (36 variables).

Minimum Hardware: PDP-8 with TTY, 4K CPU
Other Programs Needed: Floating Point Package #2 (Digital 8-5B-S)
Source Language: PAL III

DECUS NO. 8-430

DECK: A Random Deck of Cards

Alan Weiner, Needham High School, Needham, Massachusetts

DECK is a routine for getting an entire 52 card deck on a computer. As it is currently written it merely prints the deck out on the teletype. The algorithm used is simple; most of the program is used for typing the deck out in words.

Minimum Hardware: TSS/8, TTY
Source Language: BASIC8

DECUS NO. 8-431

8/I LAB Data System

Dr. D. J. Fader, Research Engineer, University of Western Ontario, London, Ontario, Canada

A system of programs for data acquisition and processing is described. A PDP-8 with special A/D and D/A hardware is used to produce mean, rms, histograms, covariances, correlations and other properties of analog input signals. Routines are available for processing results using FOCAL and a Compucorder tape cassette unit, and using a PDP-10 with a digital plotter.

Due to the sheer size of the documentation for this program we have broken it into two parts. The first, a "teaser" is supplied under the same circumstances as in normal documentation. The second, a set of five thick manuals, is subject to an extra charge. Contact the DECUS office for more information.

Minimum Hardware: 8K PDP-8, TTY, PDP-10 plus other devices noted in manuals
Storage Requirement: 8K PDP-8, 20K PDP-10
Restrictions: Use of all features requires special hardware
Source Language: PAL III, FORTRAN, FOCAL

DECUS NO. 8-432

Triple Precision Integer Package

M. T. Franklin, The Plessey Company, Limited, Fareham, Hampshire, England

This is a collection of useful subroutines for handling triple precision binary integers which are assumed to be positive numbers. They were developed for data processing type work and accounting where it was not desirable to use the floating point system.

Minimum Hardware: PDP-8, HSR/P, TTY

DECUS NO. 8-433

Extensions to "LIBRA-FOCAL"

B. Taylor, R. Helwig, A. Coston, L. L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, North Carolina

Certain changes have been made to the LIBRA 7-user FOCAL system (DEC-08-AJ5E) and also to FOCAL 1969 (DEC-08-AJAE). They include: FOCAL - Random number generator, power routine, symbol table checkpoint; LIBRA - Disk Data files, file protection, expanded FCOM function, correct user number on called programs; LIBRA - (optionally) - 680 teletype support, EAE support, DECtape save-restore (Reference Disk utility program).

Minimum Hardware:	8K PDP-8, optionally DF32 or RF08 Disk, EAE, DECtape, PT08 Teletypes or 680 Teletypes
Other Programs Needed:	FOCAL 1969, LIBRA.DF32 or LIBRA.RF08
Storage Requirement:	All of fields 0 and 1
Source Language:	PAL-8 with conditional assemblies

DECUS NO. 8-434.1 through 8-434.7

Data System for Magnetic Scanning Mass Spectrometers

James Plattner, University of Colorado Medical Center, Denver, Colorado

There are seven programs included in this system. The programs and their functions are:

8-434.1 SCAN - Acquires data from mass spectrometer and stores it on disk in Disk Monitor System format.

8-434.2 STD - Automatically identifies and converts times of peak emergence to masses for a scan of perfluoroalkane that has been acquired with the SCAN program. These results are stored on the disk for future use.

8-434.3 CONV - Effects a time to mass conversion by interpolation of a file of unknown compound spectra acquired with the SCAN program vs. a file of perfluoroalkane that has been acquired by the SCAN program and identified with the STD program.

8-434.4 TIC - Plots total ion current for a series of scans acquired by SCAN and time to mass converted by CONV.

8-434.5 TAB - Prints listings of spectra that have been converted to mass intensity files by the CONV program.

8-434.6 HIST - Plots spectra that have been acquired by SCAN and time to mass converted by CONV.

8-434.7 TUNE - Allows mass spectrometer interface to be optimized. Accumulator displays bias, oscilloscope displays timing pulses (sample rate).

Some of these programs can be implemented to work with other systems and therefore the tapes for each program may be ordered separately.

Minimum Hardware:	4K PDP-8, DF32 disk, ASR33, ADC1 A/D Converter, ms Computer interface
Other Programs Needed:	Disk Monitor System
Miscellaneous:	Incremental Plotter Optional
Source Language:	PAL-D

DECUS NO. 8-435

RECOVER

Kenneth H. Kolley
Submitted by: Michael Schatzberg, Singer-Kearfott Division, Fairfield, New Jersey

This is a program to read or write 32K words between disk and DECtape. This utility provides for saving a disk image on DECtape, restoring the disk from an image on tape and verifying a disk image against a DECtape. It is a disk to-and-from DECtape program.

Minimum Hardware:	8K PDP-8/I, DF32 disk, 1 DECtape
Storage Requirement:	0-1577 field Ø
Source Language:	MACRO-8, PAL-8

DECUS NO. 8-436

EAE - Simulator

Tuan VoDinh and Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This software simulates all the Extended Arithmetic Element (EAE) hardware instructions and allows the user to run any program which was originally written for a PDP-8/I having the EAE option on a PDP-8/I without it. All EAE instructions have to be replaced by corresponding JMS instructions.

Minimum Hardware:	PDP-8/I
Storage Requirement:	20_8 locations on page Ø plus 2 pages
Source Language:	PAL III

DECUS NO. 8-437

Computer Dating Game

Miller S. Lessell, William Diamond Junior High School, Lexington, Massachusetts

The purpose of this program is to measure the compatibility of two people by the similarity of their answers to questions on a broad variety of subjects.

Minimum Hardware:	4K PDP-8, ASR33, TTY
Source Language:	BASIC

DECUS NO. 8-438

DF-32/Sykes Swap

R. Dell and D. Branda, University of Illinois at Chicago Circle, Chicago, Illinois

This pair of programs transfers the entire contents of the DF-32 disk to or from a Sykes Compu-Corder model 1ØØ Tape Unit. It is useful for saving additional or special versions of the Disk Monitor System.

Minimum Hardware:	PDP-8/I, DF-32, EAE, Sykes Compu-Corder Cassette
Other Programs Needed:	"BASIC" routine supplied by Sykes
Storage Requirement:	Buffer: 0-6001; Coding: 6002-6777
Source Language:	PAL-D

DECUS NO. 8-439

MOVE

John Alderman, Applied Data Research, Atlanta, Georgia

This is a program to copy images of directory devices, including the system portion of SYS:.

The program will be obsoleted by DEC supplied version of PIP eventually.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 System
Storage Requirement:	2000-5000
Source Language:	PAL-8

DECUS NO. 8-440

PIPL

John Alderman, Applied Data Research, Atlanta, Georgia

This is a version of PS/8 PIP, modified to add two options, in order to be able to label paper tapes with legible symbols punched into the tapes.

These new options are /M (mark) and /W (write). They are used with either ASCII or Binary mode file transfers under PS/8, and usually are intended for direct output onto a paper tape punch, although any output device is legal.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. 8-441

DELETE

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

DELETE is a small PS/8 utility program which will delete up to nine files specified in a Command Decoder input string. If the terminating character is ALT MODE, DELETE will return to the monitor when deletion is complete. Otherwise it will request another input string.

Minimum Hardware:	8K PDP-8 with a mass storage device
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12000-12577; 12600-13177 (buffer); 03200-03377 (I/O handler)
Source Language:	PAL-8

DECUS NO. 8-442

"The BYU Boob Tube"

Associated Computer and Electronic Technologists
Submitted by: James A. Williams, Brigham Young University, Provo, Utah

When loaded and run under COLPAC 1970 (DECUS NO. 8-335) this program will, by presentation on a CRT, show the capabilities of a PDP-8 to make movies. It is a short cartoon demonstration program which uses most locations in a typical 8K PDP-8 (field 0 & 1). The program was written by students in the Electronics Technology department at BYU; comments may be directed to James A. Williams.

Minimum Hardware:	8K PDP-8, HSR, ASR33/35, KV-8 CRT or equivalent
Other Programs Needed:	COLPAC, 1970 (DECUS NO. 8-335)
Source Language:	COLPAC 1970

DECUS NO. 8-443

Keyboard Test Tape for Hot Metal Linecasters with TTS

Lance O. McCartney, Ambassador College Press, Pasadena, California

The purpose of this program is to test linecaster TTS units with tape to operate in keyboard order with slight pause between characters. Quad center code is not included but could easily be added.

Minimum Hardware:	4K PDP-8/I, High-speed 6 level paper tape punch
Storage Requirement:	0-500
Source Language:	PAL III

DECUS NO. 8-444

COREMAP

Joel Troster, Institute of Bio-Medical Electronics and Engineering, University of Toronto, Toronto, Ontario, Canada

This is a one page relocatable program to type a map of any field of core by searching for a number set in the S.R. (e.g. HLT or Zero).

Minimum Hardware:	PDP-8, ASR
Storage Requirement:	7600-7611, 7617-7623 plus 1 page anywhere
Source Language:	PAL III

DECUS NO. 8-445

FYLHLP - PS/8 File Utility Program

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

FYLHLP is a utility program designed to help the PS/8 systems programmer maintain the file system and debug file handling programs. It allows the user to list specific directory entries plus all "empty" entries on a file-structured device and to examine, modify and search blocks on the same device.

Minimum Hardware:	8K PDP-8; a mass storage device
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12ØØØ-12577; 126ØØ-13177 (buffer); Ø32ØØ-Ø3377 (I/O Handler)
Source Language:	PAL-8

DECUS NO. 8-446

A Patch to FFTS-R for Use Without the EAE

Gregory R. Ruth, MIT Charles Stark Draper Laboratory, Cambridge, Massachusetts

This patch permits the use of the Fast Fourier Transform subroutine for real valued functions (DECUS NO. 8-143) on machines without an EAE. Except for the speed of execution, the subroutine is in no way affected. Execution times for the subroutine with the patch are about three times longer.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FFTS-R (DECUS NO. 8-143)
Storage Requirement:	136_8 locations
Source Language:	PAL-8

DECUS NO. 8-447

Roots of a Polynomial by Muller's Method

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program implements Muller's root-finding method for users of BASIC. The program guides the user through entering the necessary data. Then the data are echoed in easily-readable format. After a delay until all roots are evaluated, the program types out the roots in tabular form.

Minimum Hardware:	8K PDP-8/I, ASR33
Other Programs Needed:	Edusystem 20 BASIC
Restrictions:	Execution time may be long
Source Language:	BASIC (Edusystem 20 implementation)

DECUS NO. 8-448

CORDMP - Formatted Octal Dump

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program punches an octal core dump into tape for off-line listing. The dump arranges the contents of 8 core locations on a line, with the starting address at the left, and with column headers for easy reading. Markers are provided for cutting the listings into 11-inch lengths. The accumulator lights display each address being punched.

Minimum Hardware:	4K PDP-8/I, ASR33, HSP
Storage Requirement:	One page page-relocatable in any field
Restrictions:	Dumps only one field or portion at a time
Source Language:	PAL-8/PAL III

DECUS NO. 8-449A

A Magtape Handler for the PDP-8/TU20

Howard Shapiro and Peter Lemkin, National Institutes of Health, Bethesda, Maryland

An I/O device handler is given for the TU20/TC58 Magtape. It enables reading, writing, read compare, advance and backspace records and writing end of files. It can also sense the tape's condition.

Minimum Hardware:	4K PDP-8, TU20/TC58 Magtape
Other Programs Needed:	Interrupt handler to dispatch to the magtape interrupt service routine
Storage Requirement:	Magtape is 1 page, buffer may be up to 4K in any field
Restrictions:	Set up for running on interrupt
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449B

LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

LPTQUE is a PDP-8 utility program which is used to buffer ASCII characters input from a PTØ8 to an A. B. Dick 94Ø Line Printer using the Eclectic Computer Company interface. The PDP-8 teletype may be used to send data out of the PTØ8.

Minimum Hardware:	4K PDP-8, A. B. Dick 94Ø Line Printer with Eclectic Computer Company Interface, PTØ8
Storage Requirement:	<200,577>, <600,4577>
Restrictions:	Form feeds and tabs not implemented
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449C

TALK1Ø - A PDP-8/PDP-10 Utility-Loader

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

The assembly of large programs for small machines such as a PDP-8 is apt to be laborious, time consuming and almost impossible if done on the small machine itself. In addition, the ability for many users to assemble PDP-8 programs on a PDP-10 computer using PAL-1Ø or PAL-12 lightens the load of software development on the smaller machine. TALK1Ø is

DECUS NO. 8-449C (Continued)

a PDP-8 utility/loader program. It decodes and loads ASCII coded binary files (encoded by TALK8F, DECUS NO. 10-139) sent from the PDP-10. It can transmit information to or from the PDP-10, appearing to it as a regular teletype.

Minimum Hardware:	4K or more PDP-8 with PTØ8 Interface to Dataphone or directly to PDP-10
Other Programs Needed:	TALK8F (DECUS NO. 10-139), PAL1Ø or PAL 12, all on PDP-10
Storage Requirement:	Currently <7ØØØ-7577> for program, <3200-6777> for the buffer
Restrictions:	If the PTØ8 data rate is 1Ø char/sec, large TTY buffers will overflow
Source Language:	PAL-1Ø

DECUS NO. 8-449D

Buffered I/O Subroutines for the PDP-8

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

BUF1Ø is a collection of three PDP-8 PAL subroutines which can be used for doing asynchronous character input/output. They are also useful for doing any word asynchronous queuing in other types of programs.

Minimum Hardware:	4K PDP-8
Storage Requirement:	1 page for the program and QUEUE size
Restrictions:	QUEUE size must be $<4ØØØ_8$ locations
Source Language:	PAL

EDITOR'S NOTE: The above 4 programs (8-449A, B, C, D) are available on one PDP-10 formatted DECtape together with DECUS NO. 10-139.

DECUS NO. 8-450

PS/8 Editor With Display for KV8/I (Overlay)

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This overlay provides the user with a welcome expansion of the PS/8 EDITOR. It provides: 1) Variable-size character generator, 2) Display of line numbers in scope-mode, 3) Too long lines cause automatic CRLF, 4) Permanent incorporation of HSR for "APPEND," "INSERT" from high speed reader.

Minimum Hardware:	PDP-8 with KV/8 Display and/or HSR
Other Programs Needed:	PS/8 Monitor System, PS/8 Editor
Storage Requirement:	15600-16577
Source Language:	PAL III, PAL-8

DECUS NO. 8-451

PS/8 Handler for KV/8 Vector Display

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This character generator is primarily intended to be incorporated as a device-handler in a PS/8 oriented system. It was especially designed to fit in a very small space (2-page handler). Upon entry it computes cross-page references and indirect pointers from a JMS. instruction, and is therefore completely page-relocatable. It detects CTRL/FORMs and full picture condition and then waits for the ERASE-button to be pushed.

Minimum Hardware:	PDP-8 with KV/8 Display System
Other Programs Needed:	PS/8 Programming System
Storage Requirement:	2 pages, Run-time Relocatable
Restrictions:	No tabulation incorporated
Source Language:	PAL III, PAL-8

DECUS NO. 8-452

ANSAM (Analog Sampling)

Edward Longhi, VEECO Instruments, Inc., Plainview, Long Island, New York

It is often desirable to set the level of an external device connected to the AXØ8. This program allows the user to have typed out the voltage level appearing at analog channel Ø, 1, 2 or 3 of the AXØ8. The channel to be sampled is entered via the TTY and continuous sampling ensues until halted by striking a random key. A new channel may then be selected. Typeout is directly in millivolts, including sign.

Minimum Hardware:	PDP-8, AXØ8, ASR33
Storage Requirement:	1 page
Source Language:	PAL III

DECUS NO. 8-453

Rapid Alert Program (RAP)

Richard Bachman, U. S. Naval Undersea Research and Development Center, San Diego, California

RAP, used to predict Naval Navigation Satellite rise times, is approximately 100 times faster than previous alert programs. Degradation of alert accuracy is insignificant.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFC1-PB and DEC-08-AFC3-PB)
Storage Requirement:	0-6066, 7267-7777
Source Language:	FORTRAN

DECUS NO. 8-454

Radio Teletype to ASCII

Carl Kishline, University of Wisconsin, Parkside Instructional Computing Center, Kenosha, Wisconsin

This program reads 5-channel tape as generated by a model 15 or 19 teletype and prints (and optionally punches) the corresponding characters in ASCII code. It thus allows computer operators to enjoy the beautiful art work which amateur radio operators produce.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	2 pages
Source Language:	PAL-D

DECUS NO. 8-455

CRTPAC

B. K. Moritz and M. E. VanHoosier, Naval Research Laboratory, Washington, D. C.

CRTPAC is a flexible high speed character generator and display package. It features a full ASCII character set, sub and superscripting and variable character size under program control. It makes use of a column representation algorithm resulting in average character display time well under 600μs.

Minimum Hardware:	4K PDP-8/I, VC8I or equivalent, EAE recommended
Miscellaneous:	Tapes available require EAE
Source Language:	PAL-8

DECUS NO. 8-456A

PIP "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

PIP "AH" is a modification of PIP "AF" (DEC-D8-PDAD) for use with the RK08 cartridge disk file and BUILD "AH" (DECUS NO. 8-456B). The LP08 line printer has been implemented to list ASCII files and device directories. Other changes to PIP have corrected tab control for ASCII files, provided paging for the ASR33 teletype, eliminated problems in combining ASCII files, and removed the S: , SØ: restriction for the RF08 and DECtape. Versions of PIP "AH" are also available for DF32, RF08 and DECtape systems.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	BUILD "AH" (DECUS NO. 8-456B)
Storage Requirement:	25 octal blocks
Source Language:	PAL

NOTE: A LINCtape of 8-456A and 8-456B has been submitted by Mark Hyde, DeWitt, N. Y. for OS/12 users.

DECUS NO. 8-456B

BUILD "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

BUILD "AH" is an extension of the "AF" Disk System Builder (DEC-D8-SBAF) and will build the Disk/DECtape Monitor System on the RK08 cartridge disk file. The RK08 system structure is similar to the RF08, with each cartridge containing two pseudo devices. Each pseudo device has a storage capacity of 3,000 octal blocks and its own directory. BUILD "AH" also permits the LP08 line printer to be defined as a system output device recognized by the command decoder. All functions of the "AF" builder are retained. BUILD "AH" eliminates required conversion of programs currently operating under the Disk Monitor System when the RK08 is obtained for use with PS/8.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	PIP "AH" (DECUS NO. 8-456A)
Source Language:	PAL

DECUS NO. 8-457

DTFIX

P. T. Hodgin, Jr., Research Computation Center, Indianapolis, Indiana

This is a TSS/8 program to handle DECtapes, including ZEROing, COPYing, LISTing and DEPOSITing. A method is available to return to "OPTION?" at any time during the running of the program.

Minimum Hardware:	PDP-8/I with TS/8 Monitor (or equivalent), DECtapes
Other Programs Needed:	TS/8 Monitor
Storage Requirement:	6 Disk Segments (12 DECtape segments)
Source Language:	PAL-D

DECUS NO 8-458

VW - Field Independent I/O Handler for Disk and TTY

R. A. Seeman, The Boeing Company, Renton, Washington

This program provides field independent disk transfers and TTY message typeout. It can reside in any core field and can be called from core field without restriction, except that the program cannot reside in Page Ø. It is a user called subroutine and requires no program other than the user program.

Minimum Hardware:	4K PDP-8, ASR33 or 35, DF32
Storage Requirement:	200_8 (one page)
Source Language:	PAL-D

DECUS NO. 8-459

TAYEX - Taylor Expansion Equation Solver

David G. Pitts and James Westgard, Indiana State University, Terre Haute, Indiana

TAYEX is a program to solve differential equations by use of the Taylor series and an iteration procedure for the coefficients. It can solve any number of simultaneous nonlinear differential equations. One pass of the program is needed to type a table of values for each variable.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	Basic Floating Point Package (DEC-08-YQ1A-PB) or 4 word Floating Point Package (DEC-08-FMHA-PB)
Storage Requirement:	0-577, 5600-7577
Source Language:	PAL III

DECUS NO. 8-460

TT89 - Tape Transfer PDP-8 to PDP-9

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

This program writes ASCII files from PDP-8 devices onto a PDP-9 DECtape. The PDP-9 DECtape directory can also be listed or zeroed, and files can be deleted.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-D

DECUS NO. 8-461

COPY1Ø - PDP-10 DECtape Program for the PDP-8

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

COPY1Ø reads and writes files between PDP-8 devices (disk, DECtape (in TSS/8 format), paper tape) and a PDP-10 DECtape. ASCII files can be read from or written to the PDP-10 DECtape. BIN files (generated by PAL-10) can also be read. Program also reads PDP-10 ASCII paper tapes.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape Control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-1Ø

DECUS NO. 8-462

INSTIN

Paul Kinzelman, Carnegie Mellon University, Pittsburgh, Pennsylvania

INSTIN is a program which will solve instant insanity. The puzzle consists of four cubes, each side of which is colored white, red, green or blue. To solve the puzzle, one must stack the cubes in a line so that each color appears only once along a side which is four cubes long. The program will find and print out all the basic solutions. The program allows the user to change the puzzle by switching colored sides or by changing the color of sides. The user may inhibit the printing of the solutions to determine the number of basic solutions quickly.

Minimum Hardware:	Any configuration which will run BASIC
Miscellaneous:	Owning the puzzle "Instant Insanity" seems to be a prerequisite
Source Language:	BASIC

DECUS NO. 8-463

Perpetual Calendar (BASIC Version)

Daniel Gutierrez, Granada Hills High School, Granada Hills, California

This program is similar to DECUS NO. 8-71 but is written in BASIC. It will provide the day of the week for any date entered. It is particularly useful for demonstrating the computer's ability to perform simple problems as well as more complex ones.

Minimum Hardware:	4K PDP-8 with Teletype
Source Language:	BASIC

DECUS NO. 8-464b

MTA: TRØ2 Magnetic Tape Handler

Lawrence E. Holboke, Environmental Protection Agency, Research Triangle Park, North Carolina

A two page handler which allows the use of a 7 or 9 track type TRØ2 incremental magnetic tape in a manner similar to DECtape. Tape motion has been reduced to a minimum to increase speed. Each block of data (256 words) is contained in one tape block along with parity bits and block number identification. Parity checking is done twice for every word read and status tests are performed before and after each read, write and positioning operation. In case of parity error, three additional reads are attempted before a fatal error exit is taken. Up to 2Ø47 blocks are available, depending on the length of tape. All interrupt flags are left down at exit. Tape must be formatted prior to use with "MTAMRK" and must be initialized at each loading with "INIT". Unloading is accomplished by "UNLOAD."

Minimum Hardware:	OS/8, TRØ2 Incremental Magnetic Tape
Storage Requirement:	256
Source Language:	PAL

DECUS NO. 8-465

The SKED Software System

Dr. A. G. Snapper, Psychology Research Lab., Franklin D. Roosevelt V. A. Hospital, Montrose, New York
Contribution and submittal by: Andrew Walker, Digital Equipment Corporation, Maynard, Massachusetts

SKED is a process control software system that has been developed for use in the behavioral research laboratory. The software system consists of:

DECUS NO. 8-465 (Continued)

A. The Two-Pass SKED Compiler, B. The Run Time System (R.T.S.), C. The Debug System, D. The System Builder.

Minimum Hardware: 4K PDP-8, ASR33, real-time 1ØØ cycle clock, hardware interface between processor and the experimental stations. High speed reader and punch and extra 4K useful and desireable

Note: Because of the excessive size of the listing and ASCII tapes the service charges will be $10.00 for each.

DECUS NO. 8-466A

RL Monitor System (WCFMPG Version)
P?S-08-1.1A

Richard Lary, et al
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This system is a general purpose monitor, editor, file handler, etc. It is specifically designed to run on a near minimal configuration (4K and one DECtape drive). It allows the user to save both source and binary files on the DECtape. The line number editor permits resequencing, editing, deleting lines, auto-sequence mode.

Minimum Hardware: 4K PDP-8, ASR33, TU55 DECtape drive, TCØ1 controller
Storage Requirement: Ø-7777
Source Language: PAL III

DECUS NO. 8-466B

RL Monitor Subsystems
P?S-08-1.1B

Richard Lary
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

Two subsystems are given: BIN - A Binary Loader- Allows loading from binary DECtape files. EDIT - A Batch Facility - Allows executing monitor commands from DECtape source files.

Minimum Hardware: 4K PDP-8, ASR33, TU55 DECtape drive, TCØ1 controller
Other Programs Needed: RL Monitor System
Source Language: PAL III

DECUS NO. 8-466C

Listing Utility Programs
P?S-08-1.1C

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

There are three listing routines described in this package:
TIDY - Makes neat listings of PAL III source programs.
LISTER - A SNOBOL program which is slower than TIDY but gives page numbering, headings and storage locations.
SNOLST - A SNOBOL program similar to LISTER, which makes neat listings of POLY SNOBOL source programs.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: SNOLST and LISTER require POLYSNOBOL, TIDY requires PAL III, RL Monitor
Source Language: POLY SNOBOL and PAL III

DECUS NO. 8-466D

RL Monitor System Utilities
P?S-08-1.1D

Mario DeNobili, et al
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

PACK, UNPACK - allows reshuffling of RL Monitor source files. SYLIST, UPDATE - allows dumping and creating subsystems. *BPTTMT - allows conversion of DEC binary paper tapes to RL DECtape format. *PUNTAP, PUNSYS RLOADR - allows quick conversion between paper tape and DECtape information.

*NOTE - Although these routines are listed here and are on the RL Monitor System DECtape there are no write-ups currently available for them.

Minimum Hardware: 4K PDP-8, ASR33, TU55, TCØ1
Other Programs Needed: RL Monitor System
Source Language: PAL III

DECUS NO. 8-466E

DECtape Utility Programs
P?S-08-1.1E

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

DUMP: General purpose system to dump blocks from DECtape in both octal and packed ASCII, to transfer blocks from one tape to another, and to change specific words in a given block.
DECTAP (and FASTAP): One-page subroutines which allow you to easily read and write blocks of information on DECtapes.
4MAT: This routine is used to format new DECtapes. It is contained on the RL Monitor System DECtape (DECUS NO. 8-466UØ) but not on the paper tape offered for this program.

Minimum Hardware: 4K PDP-8, ASR33, TCØ1, TU55
Storage Requirement: DUMP: 4 pages; DECTAP: 1 page
Source Language: PAL III

DECUS NO. 8-466F

PAL III Modified for RL Monitor

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a modified version of DEC's PAL III assembler which takes source from TTY or DECtape files and produces binary on TTY or DECtape files.

Minimum Hardware:	4K PDP-8, ASR33, TCØ1, TU55
Other Programs Needed:	RL Monitor System
Restrictions:	Only assembles 4K programs, cannot use high speed punch
Source Language:	PAL III

DECUS NO. 8-466G

POLY SNOBOL
P?S-08-1.1G

Hank Maurer
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a string manipulation language which is a weak form of SNOBOL I, originally developed by Griswold, Farber and Polonsky of Bell Telephone Laboratories. It bears only faint resemblance to SNOBOL IV.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	Runs stand alone or under RL Monitor (requires EAE in latter case)
Source Language:	PAL III

DECUS NO. 8-466H

POLY LISP
P?S-08-1.1H

Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a weak, but useful, LISP interpreter. Source files can come from DECtape.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	Runs stand alone or under RL Monitor System
Source Language:	PAL III

DECUS NO. 8-4661

FOCAL Modified for RL Monitor

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a modified version of DEC's FOCAL compiler. Source can come from DECtape files.

Minimum Hardware:	4K PDP-8, ASR33, TU55, TCØ1
Other Programs Needed:	RL Monitor System
Source Language:	PAL III

DECUS NO. 8-466UØ

The sources and systems for all the above programs, on an RL Monitor System DECtape, may be ordered under this number.

DECUS NO. 8-467a

BINREAD (Revised Version)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Disassembles binary object tapes, giving an octal listing of all field and address codes, and of the data/instructions which follow them. Data are arranged in 8-line paragraphs, facilitating address counting. The format is familiar and legible; the execution is rapid. In addition, certain errors are checked for; if found, the computer halts after typing ?. The tape checksum is read and printed out; it is followed by a computed checksum which should agree with it.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	8/E: 4000-4310; 8/I etc: 4000-4321
Source Language:	PAL III

DECUS NO. 8-468

DIPDUB, A Dual-Independent Parameter, Double-Precision Pulse-Height Analysis Code

W. H. Wilkie, Ph.D., University of Pittsburgh, Pittsburgh, Pennsylvania

DIPDUB is a powerful, general-purpose, pulse-height analysis code designed for radiation physics applications where 255-channel energy resolution is adequate. Some features are: independent operation of 2 ADC's; 7 data regions in core; 369 DECtape storage blocks; spectrum stripping; very flexible display capability.

Minimum Hardware:	PDP-8 series with 8K core and EAE; Fast Paper Tape Unit; DECtape, PHA interface NKO4-A; 2 Nuclear ADC's; Oscilloscope
Source Language:	PAL-10

DECUS NO. 8-469

Top Secret

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This routine accepts characters from the keyboard of an ASR33 and responds by typing a ciphered version of the input text. It has three uses: (a) pure amusement, (b) as a demonstration of the fact that an on-line teletype is not a typewriter; it will

DECUS NO. 8-469 (Continued)

print what the computer tells it to print, which may or may not be what the user types. (c) as a simple example of input-output programming and of program branching, for students of machine language.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: PAL III

DECUS NO. 8-470

ODT-11 (High) Modified

J. Shanahan
Submitted by: J. H. McClure, E. I. duPont de Nemours and Co., Wilmington, Delaware

Since it is sometimes necessary to work on programs longer than can be accommodated by ODT-11 (e.g. program occupying locations $0-7576_8$), the ODT-11 program was modified to enable transfer to another bank of core memory. ODT-11, modified, resides in data field Ø, program being debugged resides in data field 1. All the operations and instructions given in Manual Digital 8-12-S, ODT-11, August 26, 1965, apply and are used as indicated.

Since there is a slight variation when using a KSR35, please specify when ordering tape whether for ASR33 (Tape A) of KSR35 (Tape B).

Minimum Hardware: 8K PDP-8
Storage Requirement: 745 (octal) locations, resides between 6632 and 7577, also uses loc 0005
Restrictions: Differs from ODT-11 in that it operates outside the core memory module in which it resides

DECUS NO. 8-471

Verify Paper Tape (12K)

J. Shanahan
Submitted by: J. H. McClure, E. I. duPont de Nemours and Co., Wilmington, Delaware

This is a program to verify that a tape is the same as the one from which it was copied, or that two copies of a tape are the same. It is applicable to a PDP-8 system having at least 12K core.

Minimum Hardware: 12K PDP-8 with EAE

DECUS NO. 8-472

PS8IN, PS8OUT

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

Designed to make PS/8 input-output programming much easier, the two modules perform automatic actions like calling the COMMAND DECODER, opening and closing files, etc. A JMS to PS8IN simply returns the next character, a JMS to PS8OUT writes it away. The routines relieve the programmer from the cumbersome PS/8 I/O programming, and they can be used separately. (These two modules make PS/8 input-output programming as easy as teletype input-output.

Minimum Hardware: PS/8 configuration
Other Programs Needed: PS/8 software
Restrictions: Designed for 8 bit ASCII on Binary, resides in Field 1 only, not restartable
Source Language: PAL-8

DECUS NO. 8-473

Three Utility Routines for PS/8
1. DTA and DECLAB
2. CHANGE and REMOVE
3. LIST

John R. Covert, Georgia Institute of Technology, Atlanta, Georgia

1. DTA and DECLAB provide an automatic assignment of user device names to DECtapes from an internally recorded label. It reduces errors from specifying the wrong DECtape on multi-drive systems.

2. CHANGE and REMOVE pseudo-commands provide the ability to change names in the directory of a PS/8 device with a simple "command," and the ability to remove up to 32 files with one command. It provides more comprehensive error messages than PIP.

3. LIST is a program to list PS/8 directions on KV8/I scope.

Minimum Hardware: PDP-8 with DECtape
Other Programs Needed: PS/8 software
Source Language: PAL-8

DECUS NO. 8-474

EXIT PS/8

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

The EXIT program is used to exit from the PS/8 programming system. EXIT will determine what the system device is and load in the proper bootstrap. The program will also load a binary loader into Field 1 and rewind all DECtapes.

Minimum Hardware: PDP-8 DECtape, Disk
Other Programs Needed: PS/8 software
Source Language: PAL-8

DECUS NO. 8-475

PIPQ

John C. Alderman, Jr., Applied Data Research, Inc., Atlanta, Georgia

PIPQ is an extension of PIPL (DECUS NO. 8-440). This version adds the /Q option which is a facility similar to the

DECUS NO. 8-475 (Continued)

PDP-12 DIAL QL (quicklist) assembler command. The /W and /M options are retained from PIPL and work the same as in DECUS NO. 8-440.

Minimum Hardware: PS/8 configuration
Storage Requirement: 12000-17577
Source Language: PAL-8

DECUS NO. 8-476 (OBSOLETE)

PS/8 LOG Command

For users who previously ordered this program the following patches are suggested.

To eliminate LOGON feature: During system generation, after loading the modified PS/8 tape and CONFIG, change location 00271 from 4052 to 7000 using ODT.

On DECtape based system: The LOGON, OFF, and KJOB commands use location 07777 for a flag to indicate LOG ON or OFF status.

For CONFIG with DECtape system handler at 07777 change the line reading "SBLKCT=7777" to "SBLKCT=7753." This assumes that the disk that would use location 7753 for data break is not present in a configuration where DECtape is the system device.

DECUS NO. 8-477

RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System

Rene P. Loretan, University of Essex, Colchester, Esses, England

Loads the RIM and BIN loaders in the original position in both fields by first calling them in a lower core region and execution of a relocation program. Afterwards, the memory locations up to 7477 are cleared and control is given to the binary loader with IF=1, DF=0.

Minimum Hardware: 8K PDP-8, One DECtape transport
Storage Requirement: 7600-7777 and 17600-17777 (like PS/8 monitor)
Source Language: PAL-8

DECUS NO. 8-478

Monitor Command Extensions in PS/8

John R. Covert, Georgia Institute of Technology, Atlanta, Georgia

OBSOLETE

This package expands the monitor ('.' mode) command set. It adds LOGON, KJOB, CREATE, EDIT, COMPILE, DELETE, RENAME, DIRECT and FILE commands in PDP-10 compatible syntax.

See also DECUS NOS. 8-334, 8-473 and 8-476.

Minimum Hardware: PS/8 configuration
Other Programs Needed: PS/8 software
Restrictions: Uses slightly more disk than 6 Nov. 70 release of PS/8; some monitor level operations will be slower for DECtape only configuration.
Source Language: PAL-8, FORTRAN

DECUS NO. 8-479

PDP-8/E Instruction Simulators for Other PDP-8's

Guy L. Steele, Jr., Brighton, Massachusetts

These subroutines allow the user of a PDP-8 other than an 8/E to write programs or use programs intended for an 8/E. They simulate the operation of the 8/E instructions BSW and the standard MQ microinstruction combination, using one-word JMS's. Thus, with JMS's substituted for micro instructions an 8/E program can run on any PDP-8.

Minimum Hardware: PDP-8 (any model)
Storage Requirement: 7 locations on page Ø and 43_{10} on any other page(s)
Restrictions: No provision is made for crossing instruction fields or for EAE
Source Language: PAL III

DECUS NO. 8-480a

Two Subroutines for 8K FORTRAN
1. INPUT
2. RANDU and GAUSS

Lars Palmer, A. B. Hassle, Goteborg, Sweden

1. INPUT is a relocatable input routine for input in free format to 8K FORTRAN programs.

2. RANDU and GAUSS are random number generators for 8K FORTRAN.

Minimum Hardware: 8K PDP-8 with TTY or HSR
Other Programs Needed: 8K FORTRAN System
Storage Requirement: 1. 4 pages; 2. 3 pages
Source Language: SABR

DECUS NO. 8-481a

MERGE

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

MERGE reads any number of binary paper tapes and combines their contents into a single binary output tape with a single checksum. Field pseudo-ops are correctly copied; ASCII diagnostics enclosed between rubouts are ignored.

DECUS NO. 8-481a (Continued)

Minimum Hardware: 4K PDP-8, ASR33 (HSR/P optional)
Source Language: PAL III

DECUS NO. 8-482

Patch to High ODT (DEC-08-COC2-PB)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This short patch prevents the occasional punching of channel 8 at the beginning address of a binary tape produced by the "P" command in ODT. It allows a restart after "T" or "E" commands simply by pressing "CONTINUE." Trailer halts when S. R. bit Ø is cleared.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: ODT-8
Miscellaneous: Patch is for HIGH ODT but could easily be modified (3 places) for LOW ODT
Source Language: PAL III

DECUS NO. 8-483

GRFIT, A Simple Least Squares Routine

R. C. Gross, Eastman Kodak Company, Rochester, New York

This program accepts data for the arrays x and y where there is scatter in the y array. It calculates the best least squares straight line and gives standard error estimates. A subroutine version that is essentially the same is also included.

Minimum Hardware: 8K PDP-8, 1 DECtape
Other Programs Needed: PS/8 Operating System and FORTRAN
Miscellaneous: See also FOCAL8-209
Source Language: PS/8 FORTRAN

DECUS NO. 8-484

RESTore for the RKØ8

Lee H. Nichols III, E. I. duPont de Nemours and Co., Inc., Wilmington, Delaware

RESTore is a sequel to REST (DEC-08-RWDA) for the Disk Monitor System built on a RKØ8 cartridge disk file. RESTore allows the user to create a protected area for regularly used programs or data files and leave the remainder of the disk pseudo-device as a working scratch area. Whenever the scratch area is filled or no longer needed, it can be quickly erased without disturbing the protected programs.

Minimum Hardware: RKØ8 Cartridge Disk File
Other Programs Needed: BUILD "AH" (DECUS NO. 8-456B)
Storage Requirement: 2 octal blocks
Restrictions: For use with RKØ8 only
Source Language: PAL

DECUS NO. 8-485

Geometric Data Truncation for Fourier Transform Programs

E. A. Barnhardt, Southwestern at Memphis, Memphis, Tennessee

This program is intended for use as a truncating-weighting subroutine. The application of a weighting function to the data record before the application of a Fourier transform program reduces the spread in frequencies which results from the transformation of a finite record.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FFT
Storage Requirement: 115_8
Source Language: PAL III

DECUS NO. 8-486

SEGAR 7: A Seven Segment Array for Alphanumeric Character Generation

David J. Dowsett, Atkinson Morley's Hospital, Wimbledon, England

This program is designed as a 1 1/2 page (with pointers on page Ø) subroutine for displaying easily observed labels on an oscilloscope screen.

A seven segment display allows all numerical and some useful alphabetical characters to be generated. Spacing is automatic and can be altered.

Minimum Hardware: PDP-8; 34D Scope
Source Language: PAL III

DECUS NO. 8-487

Revised Octal Memory Dump

Masashi Kamii
Submitted by: Tomoji Yanagita, The Central Institute of Experimental Animals, Nogawa Kawasaki, Japan

This routine will output on the teletype an absolute address plus octal contents of 8 memory locations per one line and a blank line at every 8 lines. Except for the first address the leftmost address is always a multiple of 8, making it easy to search addresses.

Minimum Hardware: PDP-8, ASR33
Source Language: PAL III

DECUS NO. 8-488

NEWPAGE

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program reads a binary tape on the low speed reader and punches out a relocated copy on the low speed punch. Address instructions are augmented by an integer number of

DECUS NO. 8-488 (Continued)

pages selected by the user.

Warning: It will not augment address pointers; main use will be with routines one page or less in length.

Minimum Hardware:	4K PDP-8; (HSR/P optional)
Restrictions:	Field pseudo-ops will not be copied; field instructions will
Source Language:	PAL III

DECUS NO. 8-489

SUBSET, Interger Compiler and Operating System

R. F. LaFontaine, CSIRO, Highett, Victoria, Australia

SUBSET has been developed for the 4000 word PDP-8 computers. It comprises a one-pass compiler which interprets FORTRAN/FOCAL-like source programs, and a double precision integer operating system. Its features are the ease which the system can be expanded by relocatable binary subroutines, and a reasonable amount of free memory available for the user's program (5600 octal words).

Minimum Hardware:	PDP-8/S, Teletype keyboard/Reader-Printer/Punch
Other Programs Needed:	DECUS NO. 8-130A and 130B
Storage Requirement:	0-7577
Source Language:	MACRO-8

DECUS NO. 8-490

Tape Alteration Program

C. N. Goode, University of Edinburgh, Edinburgh, Scotland

The purpose of this program is to examine and change the contents of any location on a DECtape. One block of a DECtape is called down into core and its contents examined and changed if required. The block is then written back onto the tape.

Minimum Hardware:	4K PDP-8, TU56 DECtape
Storage Requirement:	ØØØØ-1641
Source Language:	PAL-8

DECUS NO. 8-491

Indexed Floating Point Math Subroutines for PDP-8/E

Jacques Ricard, National Film Board of Canada, Montreal, Canada

This package of subroutines, which may be assembled in any order and anywhere in 4K, contains subroutines to perform floating point add, subtract, multiply, divide, input and formatted output, as well as logical operations and housekeeping routines. The subroutines fall into three general categories: 1. Index addressing, 2. Direct addressing, 3. Non-addressing.

Minimum Hardware:	4K PDP-8/E with EAE and TTY
Source Language:	PAL III

DECUS NO. 8-492

BINLOAD, BINTAPE, and SEARCH

William B. Wright
Submitted by: John W. Taylor, Bucks County Community College, Newtown, Pennsylvania

This program replaces the binary loader , DEC-08-LBAA-PM, and binary puncher, DEC-08-YX1A-PB. It can punch any or all of core and also contains a search routine for finding all occurrences of any 12-bit word in memory. A 12-instruction toggle-in bootstrap loader for the PDP-8/E for loading this routine is also offered.

Minimum Hardware:	4K PDP-8/E, TTY
Storage Requirement:	7600-7777
Restrictions:	For PDP-8/E only, but can be modified
Source Language:	PAL III

DECUS NO. 8-493

Line to Block Conversion

Ralf Beyer, DFVLR, Institut fuer Flugfuehrung, Flughafen, Germany

The program assumes k variables with n samples stored in k blocks of DECtape each containing n lines. Particular lines of one block correspond with the appropriate lines of other blocks. For data manipulation in particular in connection with DECUS NO. 8-137 "Program for Storage, Manipulation and Calculation of Data Using DECtape" the program converts the array of k blocks with n lines to an array of n blocks with k lines. Floating-point number representation is used and the size of the array may be k = 23 and n = 42 at maximum.

Minimum Hardware:	4K PDP-8, ASR33, TCØ1/TU55
Other Programs Needed:	DECUS NO. 8-137
Storage Requirement:	20-43; 200-1657; 1600-7577 (Data Buffer)
Source Language:	PAL-D

DECUS NO. 8-494

Translate Arabic Into Roman Numerals

A. Moses, Computer Applications Engineering Company, El Paso, Texas

This program translates Arabic numbers into Roman numerals. The number must be greater than 0 and less than 4000, otherwise the program will print "ENTER ARABIC NUMBER >0 & <4000" and start over.

The user enters an Arabic number followed by a terminator, such as SPACE. The program types the Roman numeral followed by a carriage return and line feed. The program is then ready to accept the next Arabic number.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	4K FORTRAN Compiler and Operating System (DEC-08-AFC1 and DEC-08-AFC3)
Source Language:	4K FORTRAN

DECUS NO. 8-495

CORRELATION ANALYSIS

Ralf Beyer, DFVLR, Institut fuer Flugfuehrung, Flughafen, Germany

This program is a patch to be used with the analysis of variance routine of DECUS NO. 8-137. After printing of the AOV-table it computes and prints F-ratios to determine the statistical significance of first and higher order correlations of the data samples.

Minimum Hardware:	4K PDP-8, ASR33, TC01/TU55
Other Programs Needed:	DECUS NO. 8-137
Restrictions:	Maximum number of blocks and lines on input reduced to 100_8 each
Source Language:	PAL-D

DECUS NO. 8-496

UTR7: A 7-track Magnetic Tape Reading Utility

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts
With overlay for TM8E Controller by H. E. Cronin, Naval Weapons Center, China Lake, California

UTR7 is a utility program designed to read and print selected records from 7-track magnetic tape, via the TC-58. Program inputs are: record length, parity, recording density, and data format. Available data format output options are: 6-bit ASCII (2 characters to a word), 8-bit ASCII, unsigned octal, unsigned decimal, unsigned hexadecimal, signed octal, signed decimal, binary and IBM 7-track tape BCDIC. The program is designed so that new options may be added easily.

Minimum Hardware:	PDP-8, ASR33, TC-58
Storage Requirement:	2343_8 locations plus tape record buffer storage
Source Language:	PAL-8

DECUS NO. 8-497A

8BAL - PDP-8 Macro Language, Version 4

David M. Kristol, Wilmington Delaware

8BAL is intended to be a general macro processor, suitable for use with PAL-8, FORTRAN, or any other language available in PS/8 which uses the system I/O structure. The program acts as a one pass "front end" to the "host" language processor, generating source code for the host language. Because 8BAL uses a special signal character ("@") that is illegal in the host language, 8BAL source code can be mixed with host language statements.

Minimum Hardware:	8K PDP-8 with mass storage device
Other Programs Needed:	PS/8-OS/8 Operating System
Miscellaneous	Will use available memory up to 16K for table storage
Source Language	PAL-8

DECUS NO. 8-497B

8BAL Source Documentation

David M. Kristol, Wilmington, Delaware

This document describes the internal workings of 8BAL from a programming standpoint.

The author wishes to point out that, while helpful, this documentation may not be absolutely accurate because it was written for an earlier version of 8BAL, not for the version currently distributed by DECUS.

DECUS NO. 8-498

Unencoded Incremental Plotter Subroutine

L. Papazian, CETIM, Senlis, France

This subroutine moves the pen of an unencoded plotter (Benson 110) to a new position along the best straight line. The pen can be raised or lowered during the motion.

All operations are controlled by JMS instructions. The accumulator does not specify the operation as in the Digital 8-12-U subroutine.

Minimum Hardware:	PDP-8/E, ASR33, Incremental Benson Plotter (model 110)
Restrictions:	Must be assembled with the main program
Source Language:	PAL III

DECUS NO. 8-499

High Speed Reader Patch for Lo Speed Macro-8

Michael K. Loukides, Hamden High School, Hamden, Connecticut

This patch changes MACRO-8's input subroutine for high speed input with all output on the ASR33. MACRO must be reloaded for low speed input.

Minimum Hardware:	PDP-8, ASR33, High speed reader
Other Programs Needed:	MACRO-8, low speed
Source Language:	PAL III

DECUS NO. 8-500

DUMP8

Charles R. Wardrop, Digital Equipment Corporation, Sunnyvale, California

This program provides an octal dump of one or more 256 word PS/8 blocks. It is device independent on both input and output by interaction with the PS/8 system. The command decoder is called for I/O specification.

Minimum Hardware:	Any PS/8 configuration
Other Programs Needed:	PS/8
Storage Requirement:	8K
Source Language:	PAL-8

July 1974

DECUS NO. 8-501

Galactic Coordinates

A. Moses, Computer Applications Engineering Company, El Paso, Texas

This program consists of two parts: the first converts star positions from astronomical coordinates (right ascension and declination) to galactic coordinates (latitute and longitude); the other converts in the reverse direction.

Minimum Hardware: 4K PDP-8L, TTY
Other Programs Needed: 4K FORTRAN Compiler and Operating System (DEC-08-AFCO)
Source Language: 4K FORTRAN

DECUS NO. 8-502

Interrupt Duplicator for Binary Object Tapes

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The program copies absolute binary tapes (produced by PAL, MACRO, ODT, etc.) from any of three readers onto any one of three punches.

This routine will not copy SABR or other relocatable binaries.

Minimum Hardware: 4K PDP-8, one or more on-line TTYs; HSR/P optional
Source Language: PAL III

DECUS NO. 8-503

MACRO-8X: 8K Extended MACRO-8 Assembler

David J. Waks
Submitted by: Robert M. Supnik, Applied Data Research, Cambridge, Massachusetts

MACRO-8X is an improved and expanded version of MACRO-8. It is also a two-pass MACRO assembler which runs on any 8K (or larger) PDP-8 family computer equipped with a high speed reader punch. Its enhancements include a large symbol table, improved literal and off-page link processing, paginated output, a formatted memory allocation table, and a number of pseudo-operations, including VFD (variable field definitions), BANK, LIST UNLIST, LIT, LITBAS, LGM and NOLGM.

Minimum Hardware: 8K PDP-8, HSR/P, TTY
Miscellaneous: No sources available

DECUS NO. 8-504A

ESI (Engineering and Scientific Interpreter)

David J. Waks
Submitted by: Robert M. Supnik, Applied Data Research, Cambridge, Massachusetts

ESI is an interactive scientific language modeled on JOSS. Its features include: decimal arithmetic, two dimensional arrays, direct and indirect statements, free format I/O, extensive English language diagnostics, straightforward statement syntax (every statement is a complete English sentence), several built in functions. Overlays are included to add and remove three extended functions - SIN, COS, SQRT.

Minimum Hardware: 4K PDP-8
Source Language: MACRO-8X

DECUS NO. 8-504B

ESIX - Extended ESI

Robert Supnik, Applied Data Research, Cambridge, Massachusetts

ESIX is an extended and improved version of ESI which runs on any 8K or larger family computer. It offers all the features of regular ESI, plus the following additional features: five times more program and array storage, automatic pagination of output, built in extended functions (SIN, COS, EXP, SQRT, LOG, LN, ARCTAN), generalized exponentiation, compound statements and comment statements.

Minimum Hardware: 8K PDP-8
Source Language: MACRO-8X

DECUS NO. 8-504C

ESI Demonstration Programs

David J. Waks, Applied Data Research, Cambridge, Massachusetts

This package consists of several sample programs for the ESI system (DECUS NO. 8-504A) which demonstrate its use. These programs are: 1. Single Load Matrix Inversion, 2. Complex Multiplication, 3. Octal Sum, 4. Statistics, and 5a-b. Multi-load Matrix Inversion. A sixth example, Zero Sum Game Solver, can be found at the back of the ESIX Guide (DECUS NO. 8-504B).

Minimum Hardware: 4K PDP-8
Other Programs Needed: ESI (DECUS NO. 8-504A) or ESIX (DECUS NO. 8-504B)
Source Language: ESI

DECUS NO. 8-505

BIN-CBL Extended Memory Loader

Jan J. Mader, Brandeis University, Waltham, Massachusetts

This loader maintains all features of DECUS NO. 8-338 (automatic selection of either BIN or CBL format, etc.). In addition it recognizes the field designation characters on binary or CBL tape so that it allows one to load a program to any memory field,

Minimum Hardware: 4K PDP-8/E, TTY
Storage Requirement: One memory page (200 octal locations)
Restrictions: Low speed I/O devices only. PDP-8/E only
Source Language: PAL III

DECUS NO. 8-506

Load Areas

J. Fraser, University of Liverpool, Liverpool, England

Load Areas is a keyboard-oriented program for PDP-8 family computers. It produces a list of the core areas which a binary or read-in mode paper tape will occupy when loaded.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	0-1143, any field
Source Language:	Subset MACRO-8, Compatible with PAL-D

DECUS NO. 8-507

EEPP (Editor Even Parity Punch)

E. D. Shepherd, Plessey Company Limited, Ilford, Essex, England

This program is a modification to Editor to punch even parity ASCII on teletype and high speed punch. Non parity tapes read into editor can be punched out with even parity.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	Symbolic Editor (DEC-08-ESAC-PB)
Storage Requirement:	39_8 locations
Source Language:	PAL III

DECUS NO. 8-508a

TSUTIL - A Utility-Diagnostic Program for TSS-8

Paul M. Kinzelman, Carnegie-Mellon University, Washington, D. C.

TSUTIL is a utility-diagnostic program for an RF08 disk TSS-8 system and should be especially useful at installations where the monitor has been modified, or where the system is operated by persons unfamiliar with how TSS-8 works.

Minimum Hardware:	TSS-8
Source Language:	PAL-D

DECUS NO. 8-509

INTERRUPT-TEST

Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

The program was developed to detect and report spurious interrupts. If an interrupt occurs, the program tries to identify it according to a list of SKIP instructions, and to clear the interrupting flag with the appropriate CLEAR instruction. The program restores page Ø after use, in order that MAINDECS in core remain unaltered.

Minimum Hardware:	4K PDP-8
Storage Requirement:	07000-07577
Restrictions:	Runs in Field Ø only
Source Language:	PAL III, PAL-8

DECUS NO. 8-510

P8COR - Overlay for 8K PAL-D Assembler for 4K Disk Monitor System (DECUS NO. 8-333)

Arthur L. Pike, Tufts University, Medford, Massachusetts

P8COR is an overlay that permits most of the features of DECUS NO. 8-333 to work as a stand-alone program for 8K users when disk or DECtape are not available.

Minimum Hardware:	8K PDP-8/I with ASR33 (Can use HSR/P if available)
Other Programs Needed:	DECUS NO. 8-333
Source Language:	PAL III (Assembled with DECUS NO. 8-333)

DECUS NO. 8-511

FPAK-4 Interrupting Floating Point Package

Robert A. Belshe, University of California, Lawrence Radiation Laboratory, Berkeley, California

This is the DEC extended floating point package plus output controller with a number of useful modifications and additions. Memory required is one page greater than the standard DEC version, plus interrupt handler.

Only the binary tape and listing are distributed by DECUS. Users who wish to obtain a source card deck may send a blank magnetic tape to the author which he will return to them with the card images of FPAK-4 and the assembler, if needed.

Minimum Hardware:	4K PDP-5 or PDP-8 family, PDP-12
Miscellaneous:	EAE Not required
Source Language:	ASSM (An LRL assembly language similar to PAL)

DECUS NO. 8-512a

Modified Binary Loader

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

1) These loaders are "customized" for LSR (TTY) or HSR (PC8-E etc.) respectively.

2) Starting addresses are 7700 or 7777.

3) Certain checks are made on binary tapes as they are read in, in addition to checksum computation at the end. Errors trigger a JMP. rather than HLT and hence cannot be overlooked.

4) The loaders take less core than the standard DEC loader; in particular, 7750-7755 are left free for data break.

5) The tapes supplied are in a hybrid RIM/BIN format which loads in roughly half the normal time. Either RIM or BIN loaders will load these tapes.

6) The high speed version (HSRBIN) can be booted into core via a 9-instruction "Help" loader bootstrap.

Source Language: PAL III

DECUS NO. 8-513

DEBUG 8

Michael S. Cole and C. W. Richardson
Submitted by: W. R. Myers, Aerojet Nuclear Company, Idaho Falls, Idaho

DEBUG 8 allows for opening and loading locations in core, execution of subroutines, insertion of breakpoints, restoring breakpoint instructions and beginning execution at a given location.

Minimum Hardware:	PDP-8, TTY
Other Programs Needed:	User Print - Input - Carriage Return - Line Feed Routines
Storage Requirement:	1 page (plus user routines)
Source Language:	PAL III

DECUS NO. 8-514

Alpha-Numeric Display Program

Ralph Norman Haber, University of Rochester, Rochester, New York

A program to display characters, along with a driver program written in FORTRAN, and a subroutine program for listening for button presses and recording reaction time in psychological experiments.

Minimum Hardware:	4K PDP-8, 34D Display or equivalent
Source Language:	PAL and FORTRAN

DECUS NO. 8-515

Program to Mate PAL III With Symbolic Editor

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program enables PAL III (in field Ø or 1) to read Symbolic Editor's text buffer directly (field 1 or Ø) without paper tape input to PAL. Editor and its storage areas are unmodified. PAL loses its low speed input routine but retains all other options.

Minimum Hardware:	8K PDP-8, TTY
Other Programs Needed:	PAL III; Symbolic Editor
Source Language:	PAL III

DECUS NO. 8-516

Self-Starting PS/8 Loader

F. J. Meijer, University of Amsterdam, Amsterdam, The Netherlands

This program produces on paper tape a self-starting PS/8 loader for the PDP-8/E with TD8-E DECtape

Minimum Hardware:	PDP-8/E with TD8-EM
Other Programs Needed:	PAL Assembler
Storage Requirement:	One Page
Source Language:	PAL

DECUS NO. 8-517

Bowling League Results, Standings and Averages Program

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program can be used to automate the weekly task of preparing bowling league results. It demonstrates the following OS/8 FORTRAN features: device independent I/O chaining and in-line SABR coding. Historical data is maintained for 128 bowlers and 16 teams.

Minimum Hardware:	8K PDP-8 with TCØ1 DECtape, HSR/P, LPØ8 Line Printer
Storage Requirement:	264_{10} OS/8 blocks
Source Language:	OS/8 FORTRAN

DECUS NO. 8-518

PS/8 FORTRAN Alphabetical Sort

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

This is an alphabetical sort of any number of fields of any width. The array to be sorted must be an integer array of ASCII characters stored in A2 format. The program is a subroutine and is called from the main program.

Minimum Hardware:	PS/8 System
Other Programs Needed:	PS/8
Source Language:	PS/8 FORTRAN

DECUS NO. 8-519

MACRO-8 Pass 3 Output Format Patch

Richard J. LaBella, Airborne Instruments Laboratory, Deer Park, New York

This patch will format the Pass 3 output on the teletype into page size blocks of either single sheets or fanfold paper.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	MACRO-8 (DEC-08-CMAB-PB)
Restrictions:	Reduces zero page literal buffer by approximately 25%
Source Language:	Machine Language

DECUS NO. 8-520

PEST/WALD/PINIT: Adaptive Psychophysics Testing Package

H. L. Kaplan, M. M. Taylor, C. D. Creelman, University of Toronto, Toronto, Canada

Three subroutines to run adaptive psychophysical testing using procedures developed by M. M. Taylor and C. D. Creelman

July 1974

DECUS NO. 8-520 (Continued)

(PEST: Efficient Estimates On Psychophysical Functions, Journal of the Acoustical Society of America, 1967, 41, 782-787) for rapid location of "threshold" stimulus values. Included is an extensive demonstration and testing package and some examples of using PEST.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	200_8 for main subroutines; 1000_8 for demonstration packages
Source Language:	PAL III

DECUS NO. 8-521

A CLOCK

Klaus Lickteig, Technische Universitaet Berlin, Berlin, Germany

This demonstration program will display a clock on the oscilloscope of an AXØ8 A/D converter. After setting the clock, the running clock will be displayed on the oscilloscope. There are possibilities to regulate the clock during running.

Minimum Hardware:	4K PDP-8, AXØ8 A/D Converter, ASR33
Storage Requirement:	Locations 0-2, 10, 20-57, 200-4347
Source Language:	PAL III

DECUS NO. 8-522

'PAGEIT'

William R. Anderson, Jr., Portsmouth Abbey School, Portsmouth, Rhode Island

'PAGEIT' is an overlay to PAL III which gives the user the option (Bit 8) to incorporate formatted listings in his first and third pass. Each listing is paged in unified length with page numbers (1-99). The user has control of an eject command which feeds to a new page. The user can also set the size of each page to his needs.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	PAL III
Storage Requirement:	200_8 locations
Restrictions:	Reduces PAL III Symbol Table from 576 to 544
Source Language:	PAL III

DECUS NO. 8-523

MDT - A Mini Debugging Technique

M. Zelkowitz, W. Christensen, L. Bourne, J. Dalton, W. Besore, Computer Science Center, University of Maryland, College Park, Maryland

MDT is a small debugging system that resides in the top page of core. It includes a binary loader, and routines that can dump core onto the teletype, modify core from the teletype and punch core in BIN format. It is designed to be quickly loaded at installations with no high speed I/O device.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7600-7777
Restrictions:	Uses slow speed I/O devices only
Source Language:	PAL III

DECUS NO. 8-524

GRNDYE 1970 - A Program to Estimate Cardiac Output Off-Line from an Indicator Dilution Curve

Jens G. Rosenkrantz, M. D. and John G. Parnevelas, M. S., Children's Hospital of Los Angeles, Los Angeles, California

An off-line program is presented which calculates cardiac output on a PDP-8 computer. It is usable in a paper tape or disk-monitor system. The program is sufficiently accurate, compared with hand calculations, to be useful to the laboratory measuring cardiac output by indicator dilution methods. It suffers from the limitations of the Stewart-Hamilton method itself.

Minimum Hardware:	4K PDP-8, HSR
Other Programs Needed:	Editor (DEC-Ø-ESAB); Floating Point Interpreter #4 (Digital-8-25-F)
Source Language:	PAL-8 (or PAL III)

DECUS NO. 8-525

DAFFT/PAFFT/DAQUAN (EAE)

Gerry Dulaney
Submitted by: Charles Romeo, Digital Equipment Corporation, Maynard, Massachusetts

DAFFT/PAFFT are overlays to DAQUAN (EAE) which support signal averaging in the time domain (up to 1024 double precision points), and FFT into frequency domain giving up to 1024 real and 1024 complex coefficients.

Minimum Hardware:	LAB 8/E (Advanced) with EAE
Source Language:	PAL-8

DECUS NO. 8-526

PROCAL 10/71

Peter G. Kretzman, Cold Spring Harbor High School, Huntington, New York

PROCAL 10/71 is a conversational symbolic logic programming system that uses the Lukasiewiczian notation and is especially oriented towards solving logical problems. Using the Special notation, the user may input his assumed premises and then see if his proposed conclusion is valid or invalid, based on those premises.

Minimum Hardware:	4K PDP-8, 8/I, 8/L or 8/E; ASR33

DECUS NO. 8-526 (Continued)

Storage Requirement:	0-1777, rest of core space if buffer and pushdown
Restrictions:	Six variables limit in logical expression
Source Language:	PAL-D

DECUS NO. 8-527

XDDT8E

Kincade N. Webb, Xenex Corporation, Waltham, Massachusetts

XDDT8E is an octal symbolic debugging program for the PDP-8E with Extended Memory which preserve the status of the program interrupt system at breakpoints. It is the result of updating XDDT (DECUS NO. 8-127) to make it operate correctly on the PDP-8E. It adds BIN and RIM punching and improves mnemonic typeouts.

Minimum Hardware:	PDP-8/E, TTY
Storage Requirement:	2K
Restrictions:	Not 8/I, 8/L compatible
Source Language:	PAL-10

DECUS NO. 8-528

TIC-TAC-TOE: Modifications to TIC 5/8, DECUS NO. 8-173

Klaus Lickteig, Technische Universitaet Berlin, Berlin, Germany

This modification to TIC 5/8 makes it possible to run TIC 5/8 on a LAB-8 System and to play TIC-TAC-TOE.

Minimum Hardware:	4K PDP-8/I or 8/E with AXØ8 A/D Converter and ASR33
Other Programs Needed:	TIC 5/8 (DECUS NO. 8-173)
Storage Requirement:	With TIC 5/8: 1-3, 33-3053
Source Language:	PAL III

DECUS NO. 8-529

OSCAR: An Operating System for Computerized Animal Research

Dennis Kuch and John Platt, McMaster University, Hamilton, Ontario, Canada

OSCAR is designed to control subject-environment interactions and to accumulate data in behavioral experimentation. Any number of experimental stations may be used, depending upon the user's application. Two to five pages of PAL programming are required from the user to determine particular experimental procedures and data manipulation while OSCAR handles all general functions of servicing the stations and interacting with the operator.

Minimum Hardware:	4K PDP-8, ASR33, experimental station interfaces, clock
Other Programs Needed:	Some program required from user for specific paradigms.
Storage Requirement:	4K (14 pages for system, the rest for storage as needed)
Miscellaneous:	RLYOUT, READ, and clock routines must be modified for different systems
Source Language:	PAL III

DECUS NO. 8-530

8BALIB - 8BAL Macro Library Generator

David M. Kristol, Wilmington, Delaware

8BALIB processes 8BAL (DECUS NO. 8-497A) source files and generates a macro library. The library may later be used by 8BAL to supply otherwise undefined macros to a source program.

Minimum Hardware:	PS/8 Configuration
Source Language:	PAL-8

DECUS NO. 8-531A&B

'TRIPLE' - 36 Bit PDP-8/E Simulator and 'TRIPLE' 8BAL Macros

David M. Kristol, Wilmington, Delaware

A) 'TRIPLE' gives the PDP-8 user a simple-to-use multiple precision capability. The triple precision routines are entered by a subroutine call, after which each computer word is interpreted as an instruction for a PDP-8/E with 36-bit operands. Most op codes (all memory references) are interpreted. Escape back to normal execution occurs via a HLT.

B) The 'TRIPLE' 8BAL Macros permit the coding of 36-bit constants and literals in a convenient way when using the 'TRIPLE' precision package. Included are numerical, symbolic and character literals.

Minimum Hardware:	PDP-8, 8/I, 8E, 8/L
Other Programs Needed:	None for A; PS/8 and DECUS NO. 8-497A for B.
Storage Requirement:	64ØØ - 7577
Source Language:	PAL-8

DECUS NO. 8-532

OPDDT (One Page DDT)

W. Friedman, Rockefeller University, New York, New York

This octal debugger may be run on any one page except zero. Like OPT it is controlled from the teletype. It sets a breakpoint, proceeds from one point to the next, examines and changes memory.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	One page of core plus location 5
Restrictions:	Cannot run on page zero
Source Language:	MACRO-8

DECUS NO. 8-533

"WHERE"

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Reads a binary tape and prints out the field and core areas which that tape will occupy when loaded.

Minimum Hardware:	4K PDP-8/E with console, TTY, Optional HSR
Other Programs Needed:	Binary Loader
Storage Requirement:	4400-4566 in any core field
Restrictions:	Will not run on 8/I or 8/L
Source Language:	PAL III

DECUS NO. 8-534

DUAL BINARY LOADER

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Used to load two binary tapes simultaneously into core.

Minimum Hardware:	8K PDP-8 with 2 TTY readers, device codes 03 and 40
Other Programs Needed:	Binary Loader
Storage Requirement:	4245-4575 in field 1. Start-14370
Restrictions:	Written for PDP-8/E; one patch needed for 8/I or 8/L
Source Language:	PAL III

DECUS NO. 8-535

BINARY PUNCH FOR PDP-8/E WITH 2 TTY's (or with high speed punch)

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Punches any number of blocks (the user need not count them) from any core fields of memory, with or without field pseudo-op codes. User and punch communicate via console keyboard. (no switch register settings).

Minimum Hardware:	4K PDP-8/E, Console keyboard and a punch not part of console keyboard
Other Programs Needed:	Binary Loader
Storage Requirement:	4000-4376, any core field
Restrictions:	8/E only
Miscellaneous:	Written for TTY punch, device code 41; patches (3) are given for High Speed Punch
Source Language:	PAL III

DECUS NO. 8-536

Advanced Averager Improvement

Dr. J. L. Blom, Laboratory Ergonomic Psychology, TNO, Amsterdam, The Netherlands

This is a series of listings for five overlays to use the Advanced Averager program under the PS/8 monitor system on the LAB-8/I. Added is a sixth part (on paper tape) which writes the calculated data to any of the output devices under the PS/8 system.

Minimum Hardware:	LAB-8/I with 8K core; 2 DECtapes
Other Programs Needed:	PS/8 Monitor System, Advanced Averager (DEC-LB-U17C-PB)
Restrictions:	Runs only on 8K
Source Language:	PAL-D

DECUS NO. 8-537

Talking Eights

Louise Gerhart, Digital Equipment Corporation, Maynard, Massachusetts

This program transmits and receives synchronous messages between two PDP-8/Es. Messages are entered via teletype so that operators at remote points may hold a "conversation."

Minimum Hardware:	2 PDP-8/Es equipped with 4K core, DP8E Synchronous Interface Modems and Lines
Storage Requirement:	4K
Source Language:	PAL-8

DECUS NO. 8-538

Integer IOH for FORTRAN Library

Ronald C. Barrett, Northwestern University, Evanston, Illinois

INTIOH is for use with FORTRAN programs having only integer arithmetic, and is a substitute for the format interpreting routine of the PS/8 FORTRAN library. Eight pages of core are saved. A new format is defined for input of file names used in device independent input/output and chaining.

Minimum Hardware:	8K PDP-8 or PDP-12, Disk or DECtape
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	6 pages - 1400_8 words
Source Language:	SABR

DECUS NO. 8-539

TD8E 4K Loader

Mark G. Roberts, Digital Equipment Corporation, Albuquerque, New Mexico

This package contains a one-page handler to load from TD8E

DECUS NO. 8-539 (Continued)

DECtape and a program to load paper tape onto DECtape. It will load everything except last page of memory; requires two passes of paper tape.

Minimum Hardware:	4K PDP-8/E, TD8E DECtapes
Other Programs Needed:	Binary Loader; TD8E DECtape Subroutine
Restrictions:	Only works in 4K of memory
Source Language:	PAL III

DECUS NO. 8-540A

BRAILLE-8

Richard Rubinstein, University of California, Irvine, California

BRAILLE-8 enables a blind time-sharing user to use a remote computer interactively with output in Braille. Connection to the remote machine is via an EIA-compatible line which may be hardwired or used with an acoustic coupler. BRAILLE-8 translates characters and buffers output to the (easily modified) console teletype.

A complete one-cell Braille representation of the standard teletype character set is used, and Braille output codes may be modified easily by the table changes if the user so desires. Available switch options: Full/half duplex; Hold output; Flush buffer.

Minimum Hardware:	PDP-8/E, 4K, Bootstrap loader, ASR33 (with Braille modification), KL8EX EIA interface
Restrictions:	Uses core occupied by bootstrap loader
Miscellaneous:	Contact DEC Computer Special Systems for teletype modification information
Source Language:	PAL-8

DECUS NO. 8-540B

BPRINT

Richard Rubinstein, University of California, Irvine, California

BPRINT is a subroutine which enables a user's main program to emboss Braille on a modified ASR33 teletype. A complete one-cell Braille representation of the standard teletype character set is used, and Braille output codes may be modified easily if the user so desires.

Minimum Hardware:	4K PDP-8, ASR33 (with Braille modification)
Other Programs Needed:	Main user program
Storage Requirement:	One page
Restrictions:	User's program must initialize teleprinter flag
Miscellaneous:	Contact DEC Computer Special Systems for teletype modification information
Source Language:	PAL-8

DECUS NO. 8-541

Cassette Utility Program and PALC

E. Della Torre and J. Roitman, McMaster University, Hamilton, Ontario, Canada

The Cassette Utility Programs are a group of programs designed to help in the preparation of programs for the PDP-8 computer. They consist of an Editor program, two tabulator programs, a page format program, a binary duplicator and a binary tape assembler and disassembler which are described in full in the write-up, PALC is a version of PAL III using cassette recorders.

Minimum Hardware:	PDP-8, 4K, TTY, Two (Compucorder) Cassette recorders; High Speed Reader and/or Punch are desirable.

DECUS NO. 8-542

Radioactive Decay

A. L. Al-Nuaimi, Ontario Hydro, Pickering G. S., Pickering, Ontario, Canada

This program solves the radioactive decay equation:

$$A = A_o e^{-\lambda t}, \quad A = (A\emptyset)*EXP(-DT)$$

for any one of the four variables:

A= activity after decay
AØ=activity before decay=original activity
TH=half-life of the radioisotope
T=time of decay, where:
D= the decay constant (λ)= .69315/TH.

Minimum Hardware:	PDP-8/I, 4K, Disk
Other Programs Needed:	Disk Monitor and FORTRAN-D Operating Systems
Restrictions:	Teletype Input-Output only
Miscellaneous:	After completing a set of computations, program restarts itself
Source Language:	FORTRAN-D

DECUS NO. 8-543

TS8REV - Reverse Assembler for TSS/8

William Harts, Dix Hills, New York

This program is an adaptation of DECUS NO. 8-178, Reverse Assembler, which has been modified to run on a standard TSS/8 computer. It will provide PAL mnemonics from any RIM, BINARY or SAVE format tape. This can be very useful in debugging a program when the user does not have a symbolic listing.

DECUS NO. 8-543 (Continued)

Minimum Hardware:	TSS/8
Storage Requirement:	15 TSS/8 Disk Segments
Restrictions:	HSR input and TTY output only
Miscellaneous:	Tape offered is TSS/8 SAVE format
Source Language:	PAL-D

DECUS NO. 8-544

CHECK and CHANGE-D

Benjamin C. Woodbury, Holden, Massachusetts

CHECK and CHANGE-D is an octal debugging program. Its advantage over DEC's DDT is that it loses no locations of core. It takes advantage of Monitor's scratch blocks, and automatic input-output block reading into core. CHECK and CHANGE-D stores its master controller in this place, reads specific blocks over itself, and uses 7200-7377 for a scratch page. When finished it restores block 2.

Minimum Hardware:	4K PDP-8, at least one disk unit, ASR33
Other Programs Needed:	DEC's Monitor System
Source Language:	PAL-D

DECUS NO. 8-545

PIF (Program Interrupt Facility for 3 TTY's)

Gary R. Garber, Laurence High School North, Trenton, New Jersey

This is a one page utility or demonstration program that recognizes CR/LF and CTRL/TAB on an interrupt basis. It was originally designed to facilitate easier typing of programs, but can be expanded to almost any use on an interrupt basis.

Minimum Hardware:	4K PDP-8, 1 to 3 TTY's
Source Language:	PAL III

DECUS NO. 8-546

DETEF - DECtape File-Handling System

Dr. Carl Reutersward, Research Institute of National Defense, Sundbyberg, Sweden

The DETEF system comprises:

1. A keyboard monitor similar to the Disk/DECtape Monitor, but better suited to tape operation. Programs are loaded, saved and recalled as named files made up of sequences of contiguous blocks. Files of many type-designations may be allocated and deleted by monitor commands. The resident DECtape handler operates in the continuous mode (core locations, not pages, are specified).

2. Utility programs for reading file directory, for packing and copying files, etc.

3. A modification of FOCAL W: Segmented program and data files accessed by programmed saving and loading operations; variables not erased by loading of programs; two data buffers for economic storage of floating point numbers and 12-bit integers.

4. An adaption of EDIT: DECtape files for input and output; multiple inputs; input used for output; listing of line numbers.

5. An adaption of PALD: control of extent of assembly listing; symbol table expansion through storage on DECtape.

Minimum Hardware:	4K PDP-8/I, EAE, TC01, one TU55; Optional: HSR/P, 32K, eight TU55's, AX08
Storage Requirement:	7600 to 7777 (Monitor loader and DECtape handler)

DECUS NO. 8-547

Advanced Averager Program (Rotterdam Version)

L.T.M.E. Hillegers and S. Miller, Medical Faculty, Department of Anatomy, Rotterdam, The Netherlands

This is a modification of the LAB-8 Advanced Averager Program (Paper Tape Version C. DEC-LB-U17/18C-LA) for one-pass loading of Sections III, IV and V, including additional functions used in neurophysiological research (oscilloscope display of reflex conditioning curves).

Minimum Hardware:	4K PDP-8/L, AX08 Laboratory Peripheral, TTY, Oscilloscope
Other Programs Needed:	RIM and BIN Loaders

DECUS NO. 8-548

Links to Page Routine

Leendert Paul Geffen, Data Research Associates, Wayland, Massachusetts

Provides convenient numbered pages in Pass 3 listing of assemblers, and for output of Reverse Assembler, without the necessity of punching tape and reading it again through the Page Routine. With MACRO-8, output will halt after body of the listing, and "Continue" must be pressed to get symbol table. Assembler links are furnished in two versions each, with main program in either field 1 or field Ø.

Minimum Hardware:	8K PDP-8, ASR33 (4K for Reverse Assembler)
Other Programs Needed:	DECUS NO. 8-184 reassembled @ *6000 (BIN tape of this is included with BIN tape offered); Either DECUS NO. 8-178, Reverse Assembler DEC-08-ASCI-PB, PAL III, or DEC-08-CMAB-PB MACRO-8, High and Low speed combined as the case may be
Source Language:	PAL

DECUS NO. 8-549

Polynomial Least Squares Fit

Guy R. Sherwood, Edward Hines, Jr. V. A. Hospital, Hines, Illinois

This program works on the least squares principle and calculates the coefficients for a polynomial equation. It allows for up to 12 different degree equations. It also allows for up to 12 values of X, F(X), and the weight of each value to be entered. The program permits up to 3 values of F(X) for each X to be entered. The maximum degree this program can fit depends on the data.

Minimum Hardware: 8K PDP-8/I, TTY
Source Language: PS/8 FORTRAN

DECUS NO. 8-550

Modified Matrix Inversion -Real Numbers

John W. Horm, University of Pittsburgh, Pittsburgh, Pennsylvania

This is similar to "Matrix Inversion - Real Numbers" (DECUS NO. 8-72) by Professor A. E. Sapega. It has been modified to run under PS/8. Input is from the high speed paper tape reader and the output is routed to the DECwriter with the option of having a paper tape made of the inverse.

Minimum Hardware: PS/8 System, High Speed Paper Tape Reader, Punch (optional)
Storage Requirement: 8K Minimum
Source Language: PS/8 FORTRAN

DECUS NO. 8-551

COMBO

William R. Anderson, Jr. 2700 Virginia Avenue, N. W., Washington, D. C.

COMBO was developed to give the 8K user of PAL III the ability to call up PAL from the Editor. The user can lock the panel, and with the Switch Register and keyboard, call up PAL and transfer Editor's buffer to PAL without the use of lengthy paper tape operations.

Minimum Hardware: 8K PDP-8
Other Programs Needed: BIN Loader, PAL III, Symbol Editor
Source Language: PAL III

DECUS NO. 8-552

Storage Display Device Handler

Robert Moore, TROPEL, Inc., Fairport, New York

This program permits use of the Storage Scope as a line printer. A TTY key is hit to display the next page. (Pages are delimited by Form Feeds.) TABS are not expanded.

Program runs in PS/8 or OS/8 wherever 2 page handlers are permitted.

Minimum Hardware: PDP-8/I or 8/E with EAE, or PDP-8/E, 8/M or 8/E, Point plot display controller VC8E, 340, or VC8I; Storage Oscilloscope
Other Programs Needed: PS/8 System
Source Language: PAL-8

DECUS NO. 8-553

Big Brother II

Gary Garber, Laurence High School, Trenton, New Jersey

Big Brother II allows a program written in modified assembler language to be assembled in one pass and checked for errors. The program is then loaded automatically into the allotted section of core where it is executed automatically. Upon completion of the program control is transferred to Big Brother for debugging, editing or tape punching. The language is very similar to PAL III with a few formatting changes. It is at least 10 times faster than the normal assembly procedures. This program is essentially the first step toward a totally complete compiler and is very important when time is a factor. Big Brother is self-starting once the RIM has been loaded and has options for high or low speed input of ASCII tapes.

Minimum Hardware: 8K PDP-8, ASR33, High or Low Speed Reader, Memory Quotient Register
Restrictions: Program length is limited to some extent. Program can destroy itself if format is not followed.
Source Language: PAL III

DECUS NO. 8-554

ANOVA and DUNCAN

Marjorie H. Kleinman, Center for Community Research, New York, New York

ANOVA - Analysis of variance on up to 64 treatment groups. Missing data is permitted. Will compute and print out for each group the number of subjects, mean, standard deviation. T tests are performed between all possible pairs. Also, there is an option for calling DUNCAN multiple range program.

Minimum Hardware: 8K PDP-8/I, TTY, printer, disk or DECtape
Other Programs Needed: PS/8 Operating System
Source Language: FORTRAN

DECUS NO. 8-555

MULTC Multiple Correlation Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

Based upon Doolittle's method for solving simultaneous equa-

DECUS NO. 8-555 (Continued)

tions for the unknown B's. The maximum number of variables, including the dependent variable, is 8.

Minimum Hardware:	8K PDP-8 with TTY, printer and 1 DECtape or disk
Other Programs Needed:	PS/8 Operating System
Source Language:	FORTRAN

DECUS NO. 8-556

CHISQ Chi Square Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

Will compute up to 20 chi squares at a time on tables as large as 8 X 9. Missing data is permitted. Tables need not all be the same size for the same run. Items may have different ranges. There is an option for computing the contingency coefficient for each table.

Minimum Hardware:	8K PDP-8/I with TTY, printer and disk or DECtape
Other Programs Needed:	PS/8 Operating System
Source Language:	FORTRAN

DECUS NO. 8-557

CLUSTR Cluster Analysis Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

This program is based on hierarchical grouping, as described in FORTRAN PROGRAMMING FOR THE BEHAVIORAL SCIENCES, by Donald J. Veldman, and is adapted from the program provided in that book.

Minimum Hardware:	8K PDP-8, TTY, printer, 1 DECtape or disk
Other Programs Needed:	PS/8 Operating System
Source Language:	FORTRAN

DECUS NO. 8-558

CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

CORREL will compute Pearson product moment correlations on a matrix of variables as large as 80 X 80. Missing data is permitted. Before computing correlation coefficients, the appropriate means are substituted for any missing values.

PCOMP-VARMX uses the principal components method of extracting roots and vectors, and then performs varimax rotation on the factor loading matrix. Input is in the form of a square correlation matrix, and can be read from any input device. Output from CORREL may be used directly as input.

Minimum Hardware:	8K PDP-8/I with teletype, printer, 1 DF 32 disk, and 1 DECtape
Other Programs Needed:	PS/8 Operating System
Miscellaneous:	Intermediate data are stored on 2 devices, which are ASSIGNED
Source Language:	FORTRAN

DECUS NO. 8-559

CUBIC - A Digital Program for On-Line Differentiation of Sample Analog Signals

John H. J. Allum, Man-Vehicle Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts

A digital computer program CUBIC has been developed for on-line differentiation of analog voltage signals. The program accepts voltage records of a time function and yields its derivative after one program cycle time of 4.2 msecs. The velocity is obtained by employing a least mean squares cubic fit technique.

The routine is intended for experimental work either as a data reduction tool or as a control signal for a closed loop experiment. The program can be implemented on a PDP-8 digital computer with one digital to analog converter channel and one analog to digital converter channel.

Minimum Hardware:	PDP-8, 1 A/D and 1 D/A channel
Storage Requirement:	2K
Miscellaneous:	This work was supported in part by NASA Grant NGR-22-009-025
Source Language:	PAL

DECUS NO. 8-560

SAM-1

Robert L. T. Cronin, Belmont Hill School, Belmont, Massachusetts

SAM-1 is a Morse Code sending program designed to operate without D/A hardware. It utilizes the electromagnetic force emitted by core to interfere with a radio transmitter located up to 20 feet from the computer. Sending rate is variable via a SR setting. The higher the setting, the faster the rate.

Source Language:	PAL III

DECUS NO. 8-561

Revised HELP Loader for High Speed Reader and New BIN Loader

Frank Palmisano, 7 Brentwood Road, Hazlet, New Jersey

Through the use of auto-indexing, interrupt, and a minimum of other commands, the HELP loader has been shortened to seven steps, making it quicker to initialize the system.

The BIN loader has been reduced from 143_8 locations to 100_8 locations, allowing room for the TC01 bootstrap and leaving the data break locations open.

DECUS NO. 8-561 (Continued)

Minimum Hardware: 4K PDP-8, HSR
Other Programs Needed: RIM Loader
Restrictions: Must be loaded in field zero. Uses Interrupt
Source Language: PAL

DECUS NO. 8-562

DISORT

John Alderman, Digital Communications Associates, Inc., Atlanta, Georgia

This is a program to produce alphabetically ordered directory listings for PS/8. With minor patches it can be used to sort any ASCII file under PS/8.

Minimum Hardware: PS/8 Configuration
Other Programs Needed: PS/8 or OS/8 Operating System
Source Language: PAL-8

DECUS NO. 8-563

TAPE

Russell Lyons, 8 Gould Road, Lexington, Massachusetts

Punches readable characters on paper tape using the low speed punch. It can punch all characters from 240 to 337 (ASCII).

Minimum Hardware: TSS/8, ASR33
Source Language: PAL-D

DECUS NO. 8-564

A Statistical System in PS/8

Jens G. Rosenkrantz, M. D., Childrens Hospital of Los Angeles, Los Angeles, California

A system, built upon DEC's PS/8, which runs a number of programs to do statistical analyses of data. The following programs are provided: (1) Mean-Variance; (2) Student's t Test; (3) Rank Analysis; (4) Analysis of Variance; (5) Correlation; and (6) Chi Square. Additional programs can be easily added to the system.

Data may be given from a variety of input devices. Answers may be written, on the teletype, high speed punch or line printer, and are formatted on 11 inch "pages." A large number of data files may be chained together by the user, in order to permit batching of data, each file calling a particular statistical test. Thus the system can function as a desk calculator (with teletype input) or can process large batches of data unattended.

Minimum Hardware: 8K PDP-8, Disk or DECtape
Other Programs Needed: 8K FORTRAN System
Restrictions: Output limited on most programs
Source Language: PS/8 FORTRAN (FORTRAN II)

DECUS NO. 8-565

RENUM - Renumbering Program for BASIC Tapes

Dom Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

Designed to resequence an Edu-20 BASIC tape so that all line numbers are multiples of (decimal) 10. The first line number in the new version is line 100. Commands which reference line numbers (THEN, GOTO, GOSUB) are readdressed to conform to the new numbering.

Minimum Hardware: 8K PDP-8E, F or M, ASR33 or PT8E high speed reader/punch
Source Language: PAL III

DECUS NO. 8-566

PARTL

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Program to evaluate the partial fraction expansion of a rational function N(s)/D(s), that has real coefficients and D(s) are written in linear or quadratic factors. Samples of control system reduction to its "Foster Form" canonical form, and network synthesis are given.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-567

EXPO

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Evaluates the approximate exponential expansion of the transition matrix or its augmented matrix, exp (AT) where A is a square matrix and T is a sampling period, which usually appear in the state variable approach to engineering problems, $\dot{x}(nT)=x(0)$.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K SABR Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-568

CFI - Continued Fraction Inversion

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Program to convert a real continued fraction into a rational function.

DECUS NO. 8-568 (Continued)

A sample of evaluating electric network transfer function is given.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K SABR Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-569

FLIT Assembler

Gary R. Smith
Submitted by: George E. Ott, University of Wisconsin, Madison, Wisconsin

The FLIT Assembler produces a binary object tape on a high speed paper tape punch and a listing on a 33 ASR teletype from PDP-8 assembly language source tape read on a high speed reader.

FLIT has the following major advantages over other assemblers: 1. Literals and off-page linkages are automatically generated. 2. The source tape is read rapidly and reliably, reducing assembly time. 3. Line numbers appear on the listing, simplifying use of the Symbolic Editor. 4. Tabulations become 8-space fields in the listing just as with the Symbolic Editor. 5. The symbol table has room for at least 348_{10} user symbols.

FLIT does not recognize macros, floating point or double precision numbers, or Boolean operators. A few other minor source language differences exist between FLIT and other assemblers.

Minimum Hardware: 4K PDP-8, ASR33, HSR/P
Source Language: MACRO

DECUS NO. 8-570

BIN4SV

Roger Kuykendall, Electro Scientific Industries, Portland, Oregon

This program converts PS/8 - OS/8 saved files into binary files which may be stored in PS/8 - OS/8 binary format or output as binary on non-file-oriented devices (especially the paper tape punch).

Minimum Hardware: 8K PDP-8 mass storage device
Other Programs Needed: PS/8 or OS/8
Source Language: PAL-8

DECUS NO. 8-571

INPUT, OS/8 Version

Lars Palmer, Ph.D., AB Hassle, Molndal 1, Sweden

This is INPUT (DECUS NO. 8-480a) rewritten to function better under OS/8. All OS/8 devices can be read. This version will not function with paper tape FORTRAN II. A data file can be constructed with EDIT and read by FORTRAN.

Minimum Hardware: OS/8 Configuration
Other Programs Needed: 8K FORTRAN
Source Language: SABR

DECUS NO. 8-572

Combination Lettering and Duplicator-Coder Program

Ronald A. Wong, Edmund Wong Co., San Francisco, California

This program enables labeling and duplication of paper tapes in BIN or RIM format. The label is punched directly onto the copy tape and duplication can begin immediately. The input and output devices are selected automatically. Input and output can be from either high or low speed devices.

This program was written by modifying DECUS NO. 8-366 (by A. T. Siy) and DECUS NO. 8-181 (by M. A. Robinton).

Minimum Hardware: 4K PDP-8 with TTY, HSR/P optional
Restrictions: Cannot duplicate ASCII tapes on line
Source Language: PAL III

DECUS NO. 8-573

EDITS - A PS/8 Editor for Non-storage Scope Display

Ray Smith, M.I.T. Laboratory for Nuclear Science, Cambridge, Massachusetts

EDITS is a modified version of the PS/8 editor. EDITS displays a portion of the text buffer surrounding the current line. A couple of command changes have been made to facilitate its use with the display. The source can easily be reassembled to allow for different character generator hardware or software. EDITS displays line numbers if desired.

The tape includes a variety of display based software. Among the routines included is ZIP8 which: (a) Allows the PDP-8/I system to function as a remote PDP-10 terminal through the teletype console; (b) Runs with DECTAP/PA and TYPEDT.PA; (c) Allows PS/8 DECtape/PDP-10 text transmission in both directions; (d) Displays PDP-10 output on the CRT scope, if activated.

Minimum Hardware: PS/8 System, EAE, VC8/I
Other Programs Needed: PS/8 (will probably work with OS/8)
Storage Requirement: 8K
Restrictions: This program was intended for, and is used with, a hardware character generator. With the supplied software generation, the flicker is much worse
Source Language: PAL-8

DECUS NO. 8-574

TD8E System Handler for 8K PS/8

Harold T. Salive and Kim D. Ng, University of Auckland, Auckland, New Zealand

The programs permit running of PS/8 with the TD8E control and only 8K of core. ROM is not necessary with this program! A load-and-go system handler is included which makes restarting easy while preserving the user region of core. A second program included patches the system to remove the AS and DE commands and some device names. A listing is provided for a single-drive DECtape copy routine.

Minimum Hardware: 8K PDP-8, TD8E
Other Programs Needed: PS/8
Restrictions: Shouldn't use AS, De, or unit DTA1. Vulnerable to ODT. No checksum
Source Language: PAL-8

DECUS NO. 8-575

EAE Overlay for Four-Word Floating Point Package Multiply

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts

This overlay allows the Four-Word Floating Point Package (DEC-08-FMHA-D) to use an EAE in multiplication, thus decreasing the time to interpret an FMPY by a factor of 5.

Minimum Hardware: PDP-8, EAE
Other Programs Needed: DEC-08-FMHA-D
Source Language: PAL-8

DECUS NO. 8-576

LOCAL PAL8: LPAL8.SV

Harold T. Salive and Kim D. Ng, University of Auckland, Auckland, New Zealand

This program allows simple construction of a local PAL-8 having a permanent symbol table tailor-made for a local installation. A program changing symbol table is run through pass 1 of PAL-8. Then the constructor program is run. The constructor program uses the just completed pass 1 symbol table to replace the standard PAL-8 symbol table. The new local version is then saved by the program on SYS as LPAL8.SV.

Minimum Hardware: PDP-8, HSR
Other Programs Needed: PS/8, PAL-8
Source Language: PAL-8

DECUS NO. 8-577a

Paper Tape Duplicator (P.D.T.)

Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

A simpler (modified) version of the Master Tape Duplicator which does not use the interrupt facility.

Minimum Hardware: PDP-8 series processor, high speed paper tape reader and punch can be modified for low speed
Source Language: PAL III

DECUS NO. 8-578

Chromaticity Diagram

R. Jacot, Integra A. G., Wallisellen, Switzerland

From 40 measured data of the spectral transmittance of a material, the program computes and prints the coordinates in the chromaticity diagram and the transmittance for the colour temperatures 2854°K (C.I.E. standard source A) and for 2360°K.

Minimum Hardware: 4K PDP-8, TTY
Other Programs Needed: Floating Point Package 1 (DEC-08-YQ1B-PB) 4/17/70
Source Language: PAL III

DECUS NO. 8-579

LISTIT

Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

LISTIT reads an ASCII paper tape, either 7 or 8-level code, and prints its contents on the console TTY or DECwriter, restoring tabs and ejecting pages in uniform length.

Minimum Hardware: PDP-8/E (F, M), TTY or DECwriter, paper tape reader
Source Language: PAL III

DECUS NO. 8-580

Decimal to Floating Point Conversion

R. Jacot, Integra A. G., Wallisellen, Switzerland

If a lot of data in floating point format are required, this program can be used to generate a complete source tape of the data in floating point format after they have been typed in decimal form. The generated tape can be assembled independent of the main program.

Minimum Hardware: 4K PDP-8, TTY
Other Programs Needed: Floating Point Package 1 or 2 (DEC-08-YQ1B-PB or DEC-08-YQ2B) 4/17/70
Restrictions: Runs only on low speed punch
Source Language: PAL III

DECUS NO. 8-581

Obsolete

DECUS NO. 8-597 (Continued)

12. Double Precision Arithmetic Package for OS/8 FORTRAN II
March 13, 1972 - Revised: December 4, 1972

DPARITH.FT is a fast double precision integer arithmetic internal SABR type code subroutine package for use in OS/8 FORTRAN II. This package will work on any PDP-8 with or without EAE. DPCVT.FT is a FORTRAN II subroutine using DPARITH.FT to convert double precision integers to and from floating point numbers.

Other Programs Needed:	OS/8 FORTRAN II/SABR
Restrictions:	All calls to DPARITH.FT must be inside of a subroutine or main with which it is compiled
Source Language:	OS/8 FORTRAN II/SABR

13. An OS/8 FORTRAN II Function to do BCD/Decimal Number Conversion
July 6, 1972 - Revised: December 4, 1972

IBCD packs or unpacks a BCD word (3 4-bitbytes) from or to a FORTRAN integer. The word to be packed or unpacked is given in argument "I" while the result is returned in "IBCD."

Restrictions:	Converts BCD numbers in the range of 0 to 999
Source Language:	OS/8 FORTRAN II/SABR

14. DICOMED 31 Image Display Device Handler
December 5, 1972

OS/8 subroutine "DIOMED" is a FORTRAN/SABR subroutine. It displays the point, 256X256, or 1Ø24X1Ø24 raster image on the DICOMED model 31 image display as well as doing other DICOMED commands such as ERASE, CHANGE GAMMA, TURN ON VIEW LIGHT, etc.

Minimum Hardware:	DICOMED 31 display and interface, EAE
Other Programs Needed:	OS/8 FORTRAN MAIN program
Restrictions:	Arrays are passed to DIOMED through COMMON
Source Language:	FORTRAN II/SABR

15. Program to Put a LINC8 Block 0 Bootstrap to Bring in the OS/8 System Disk
January 16, 1971 - Revised: December 5, 1972

TAPBOT writes a bootstrap block on block Ø of a unit Ø LINC8 128 word/block LINCtape which is being used as an OS/8 DECtape. The LINC load switch may then be used to bootstrap in the system device which in this case is an RFØ8 disk. It should also work with minor modification for other types of disks such as the DF32 or RK8.

Minimum Hardware:	LINC8 with at least one LINCtape drive and a disk
Restrictions:	OS/8 running on a LINC8 uses some device other than LINCtape as device SYS:
Source Language:	PAL-8

16. DATE - FORTRAN II OS/8 Subroutine to Return the OS/8 Date
November 8, 1971 - Revised: December 5, 1972

"DATE" returns the OS/8 date word in integer format. The algorithm for this FORTRAN callable subroutine was borrowed from the PS/8 system support manual.

Restrictions:	Requires OS/8 date word to be previously entered
Source Language:	OS/8 FORTRAN II/SABR

17. PTØ8/Datapoint 3300 PS/8 Build Programs
December 5, 1972

Five core images modified from the original version of November 1969 PS/8 software let the user build and run a PS/8 system with a PTØ8 as the system teletype. Used at 12ØØ or 24ØØ baud with a datapoint or similar terminal, PS/8 can be run with a much greater throughput.

Minimum Hardware:	PTØ8 serial interface (device codes 40/41
Other Programs Needed:	Existing PS/8 or OS/8 system
Restrictions:	The PS/8 core image has CONFIG set for a 4 platter RFØ8. To change this, another configuration .BN image from CONFIG must be used
Source Language:	ODT patched core images

DECUS NO. 8-598

CRT: An OS/8 Handler for Tektronix 611 Storage Scope

Donald C. Uber, Bio-Medical Division, Lawrence Livermore Laboratory, Livermore, California

CRT: is a two-page, write only, non file-structured device handler for the Tektronix 611 storage scope under the OS/8 operating system. The handler is listed in BUILD format for easy addition to an OS/8 system.

Minimum Hardware:	Tektronix 611 Storage Scope and PDP-8 Interface
Restrictions:	Non-standard interface required - is described in write-up
Source Language:	PAL-8

DECUS NO. 8-599

DIBILD.; Directory Rebuilder for PS/8 or OS/8

John Alderman, Digital Communications Associates, Inc., Atlanta, Georgia

DIBILD is a PS/8 or OS/8 utility program to restore directories that have been overwritten. It processes an ASCII file that is produced by PIP in the /E format (or a file that looks like this), and constructs a directory on the specified output device. The user supplies the program with the device code for the directory that is to be constructed, and the input file name (.DI is assumed). The "systems area" of the output specifiea device is protected since files will start at block 70(8). This feature can be changed by a simple patch to the source and reassembly.

July 1974

Please note that this program is offered with no promise that it is foolproof. Support for the program is not offered, and you use it at your own risk.

Minimum Hardware: PS/8 directory device and at least one other device

DECUS NO. 8-604 (Continued)

is useful when the user wants to toggle a patch into a system program before executing that program.

Minimum Hardware: 4K PDP-8, DF32 Disk or RF08 Disk or TC01 DECtape
Other Programs Needed: Disk Monitor System (DEC-08-SBAF-PB)
Restrictions: Actual system will recognize both Disk and DECtape but GETSYS will only operate on the system device.
Source Language: PAL-D

DECUS NO. 8-605

ADUMP8

Bruno Nicoletta and G. Franco Ruffini, Digital Electronic Automation, Moncalieri, Italy

This program provides a means of punching information contained in selected blocks of any core memory field, as binary coded paper tape using the high speed or TTY punch.

Minimum Hardware: 4K PDP-8, TTY or high speed punch
Source Language: PAL III

DECUS NO. 8-606

PIP11

Steven Williamson, Carleton College, Northfield, Minnesota

PIP11 allows a PS/8 user to read and write on DECtapes formatted and initialized for either DOS or RSTS, the two most commonly used systems on the PDP-11. Additional options allowing the output of data from an 11 DECtape to a DECtape that can be used by TSS/8 BASIC are also available.

Minimum Hardware: 8K PDP-8, EAE, 1 DECtape drive (2 preferable)
Other Programs Needed: PS/8 system
Source Language: PAL-8

DECUS NO. 8-607

CALCU1

J. V. Hopson, Bureau of Customs, 2100 K Street N. W., Washington, D. C.

Makes the PDP-8 perform like a printing calculator, with addition, subtraction, multiplication, division, and exponentiation. Prints out subtotals and totals on command. Recognizes control/C for return to monitor. Utilizes one of the DEC floating point packages (EAE--if so equipped, NON-EAE, or 27-BIT). Introductory dialog gives essential operating instructions.

Minimum Hardware: PDP-8, TTY
Other Programs Needed: Floating Point Package (EAE, NON-EAE or 27- BIT)
Source Language: PAL-8

DECUS NO. 8-608

FUTIL - OS/8 File Utility

Jim Crapuchettes, Department of Anesthesis, Stanford Medical Center, and Frelan Associates, Menlo Park, California

This program allows examination and modification of OS/8 (PS/8) mass storage devices from the teletype. A wide variety of commands allows this to occur along with searching, file look-up, and 24-bit integer expression evaluation.

Minimum Hardware: OS/8 Configuration, 8K
Other Programs Needed: OS/8
Source Language: PAL-8

DECUS NO. 8-609

OCOMP - Octal Compare and Dump

Dennis McGhie and Jim Crapuchettes, Frelan Associates, Menlo Park, California

An OS/8 utility program to compare or dump OS/8 files. Masking for compares and searching for dumps are included. The output file contains the contents in octal from the first input file, of all (dump) or part of the words (compare, search) from the file. This program is useful for comparing two versions of a ".SV" file.

Minimum Hardware: OS/8 Configuration (Source file is supplied on DECtape)
Other Programs Needed: OS/8
Source Language: PAL-8

DECUS NO. 8-610

INVENT-8

Charles Moeder, Digital Equipment Corporation, Maynard, Massachusetts

INVENT-8 is a series of subroutines for manipulating binary unformatted data running under the OS/8 Monitor (OS/8 FORTRAN II). It allows the user to open input and output files as well as read and write binary unformatted, fixed length records of up to 125 12-bit word per record.

Also included is a generalized sort generator for sorting these core image records.

Minimum Hardware: OS/8 Configuration, 8K, 64K Mass storage peripheral
Other Programs Needed: OS/8 FORTRAN
Source Language: SABR

DECUS NO. 8-611

SLED - Source and Listing Editor

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

Programs written in condensed format (with lines separated by semicolons and extended as required) do not give neat listings, suitable for publication, when passed through the standard MACRO or PAL III assemblers. SLED secures a neat listing from the raw listing tape produced from the assembler, with one blank line before each label, except labels used to define zero constants, and two blank lines before every break in program counter sequence. Along each line, non-significant spaces are eliminated to give a nicely justified format, and the obtrusive semicolons are removed. The number of lines to a page are controlled and new pages automatically started at suitable points in the listing. Pagination and titling are automatic. The program can be used to lay out source tapes in a similar manner.

Minimum Hardware:	PDP-8, TTY, HSR and/or HSP optional
Restrictions:	Program written for non-standard high speed paper tape reader - use standard DEC reader with caution. One delay needs adjustment for computer other than 8/S
Source Language:	MACRO

DECUS NO. 8-612

ELAN - Elementary Linguistic Analysis

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

ELAN is a simple program for educational demonstrations of the use of a computer in language studies. From an input of arbitrary length it counts the occurrence of every letter, punctuation mark, and other symbol in the sample, and also can be set to count the occurrences of up to 64 nominated words, or the beginnings or endings of words, each with a maximum length of 7 characters, and to present all these counts in a convenient format at the end of the sample, together with a word length analysis and a count of the number of paragraphs in the sample. Input can be by paper tape, using either a teletype of HSR, or directly from the keyboard.

Minimum Hardware:	PDP-8, TTY, HSR optional
Restrictions:	Developed for non-standard HSR; use DEC HSR with caution
Source Language:	MACRO

DECUS NO. 8-613

Interconversion Between A/D Floating Point and D/A Formats

Brian C. Hodgkin, Ph.D., Maine Medical Center, Portland, Maine

A collection of subroutines is provided which makes possible the conversion of data in one format to either of the other two formats. Complex calculations can be performed on A/D inputted information using floating point arithmetic, with results outputted in any of the three formats. Machine language and floating point programs can be intermingled by appropriate initialization and use of the subroutines.

Minimum Hardware:	PDP-8, A/D and/or D/A converter
Other Programs Needed:	23-bit Floating Point Package (DEC-08-NFPPA-A-PB)
Restrictions:	Can be used in single field as is; can be modified for multi-field operation. A/D and D/A formats must be the same as ADØ1A and AA50
Source Language:	PAL III

DECUS NO. 8-614

Clock Calibration

Masashi Kamii, The Central Institute for Experimental Animals, Nogawa, Kowasaki, Japan

Using CRT (RM503) and X'TAL-clock in an AX08 configuration this program allows visible calibration of the RC-clock.

Minimum Hardware:	LAB 8/I (PDP-8/I and AX08 without XR, XC, XM option)
Source Language:	PAL III

DECUS NO. 8-615

EAE Multiplication for 8K FORTRAN

Donald C. Parker, Clarkson College of Technology, Potsdam, New York

This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/I or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.RL. Core space, however, has been sacrificed for this additional speed.

Other Programs Needed:	8K FORTRAN
Source Language:	SABR

DECUS PROGRAM LIBRARY
FOCAL8 NUMERICAL INDEX
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FOCAL8-218	FOCAL Overlay CHAIN	D01, F02
FOCAL8-219	Keyboard Controlled High Speed Punch Routine for FOCAL 1969	D01, F02, G02
FOCAL8-220	Individual Tablet Assay	D01, G02
FOCAL8-221	LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation	D01, G02
FOCAL8-222	Center of Gravity Calculation	D01, F02
FOCAL8-223	FOCLX, 1972	A01, F02, W00
FOCAL8-224	SPASTIC - A System for Programming Angles, Scaler and Timer by Internal Counting	D01, F02, G06
FOCAL8-225	Loan Amortization Schedule	D01
FOCAL8-226	Frequency Transformation Program	D01, F02, G02
FOCAL8-227a	FOCL/F - An extended version of 8K FOCAL 69	A01, B13, F06, H12, J11
FOCAL8-228	Great Circle Distance Between 2 Points	D01, G02
FOCAL8-229	H-800 Wiring Diagrams	D01, G02
FOCAL8-230	CALCOMP Plotter FNEW PLOTX	D01
FOCAL8-231	Extended Precision Sine and Cosine for 4-word FOCAL	D01, F02, G02
FOCAL8-232	Roots by Inverse Interpolation	D01, G02
FOCAL8-233	A FOCAL-Correlation Program for the LAB-8 System 1. Auto-and Cross-Correlation Program 2. Auto-Correlation Program	D01, F02, G02
FOCAL8-234	Action Indicator Calculator	D01, G02
FOCAL8-235	MPS Radiation Pattern Program	D01, G02
FOCAL8-236	Polynomial Curve Fitting (Streamlined Programs)	D01, G02
FOCAL8-237	Bond Computations	D01, G02
FOCAL8-238	Millikan Oil Drop Experiment	D01, G02

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-239	DIV- Program for Division	D01, G02
FOCAL8-240	Science Fiction Quiz	D01, G02
FOCAL8-241	Satellite Orbital Parameters	D01, G02
FOCAL8-242	Solution of Linear Equation Systems with Symmetrically Matrix	D01, G02
FOCAL8-243	Analysis of Variance for One- Two - and Three-Treatment Designs for a PDP-8	D01, G06
FOCAL8-244	HANGMAN IV	D01, G02
FOCAL8-245	Executive and Utility Routines for FOCLX, 1972	D01, G02
FOCAL8-246	Undefeatable FOCAL TIC-TAC-TOE	D01, G02
FOCAL8-247	FNEWS Overlay to Use High Speed Punch with FOCAL Program	D01, F02, G02
FOCAL8-248	FOCTXT - Text Input-Output Patch to FOCAL-1969	D01, G02
FOCAL8-249a	Payroll Listings and Totals	D01, G02
FOCAL8-250	Six Curves - GMS037	D01, G02
FOCAL8-251	"WORD" - Character Generation Using FOCAL's FDIS Function	D01, G02
FOCAL8-252	12K Overlay for FOCAL	D01, F02, G02
FOCAL8-253	Solution to Any Equation Involving One Variable	D01, G02
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL, 1969	A01, F02, G02, W00
FOCAL8-255	Repeating Decimal	D01, G02
FOCAL8-256	OPTION $	D01, F02
FOCAL8-257	LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM	D01
FOCAL8-258	Hearing Loss Simulation	D01, G02
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69	D01, F02, G02
FOCAL8-260	Arithmetic and Geometric Progressions	D01, G02
FOCAL8-261	Chi Square Utility Package, CHISQR	D01, G02
FOCAL8-262	Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug	D01, G02
FOCAL8-263	ROOTS, A Polynomial Root Finder	D01, G02

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-264	MEMORY, A Children's Game	D01, G02
FOCAL8-265	LISTAL	D01, G02
FOCAL8-266a	STATPACK, An Interactive Statistical Package	A01, H12, W00
FOCAL8-267	BLACKJACK for FOCAL 1969	A01, G02, W00
FOCAL8-268	FX Function for Random Access Files	D01, G02
FOCAL8-269	4K FOCAL '69 Speed-Up Patches	D01, H12 *
FOCAL8-270	MONOPOLY	A01, G06, W00
FOCAL8-271	Modifications of FOCL/F for Data Acquisition and Control	A01, W00
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)	D01, G02
FOCAL8-273	The Phi Phenomenon	D01, G02
FOCAL8-274	FOCAL 5/69 Input Buffer Patch	D01, F02
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype	D01, G02
FOCAL8-276	The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data	D01, G02
FOCAL8-277	Newton Binomial	D01, G02
FOCAL8-278	A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$	D01, G02 (Specify 4K or 8K Tape)
FOCAL8-279	MUSECL MUS16	D01, G02
FOCAL8-280	Improved Multiply Loop for FOCAL	D01, F02, G02
FOCAL8-281	French Language FOCAL, 5/69	D01, F02, G02
FOCAL8-282	CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars	D01, G02
FOCAL8-283	Improved EAE Routine for FOCAL	D01, F02, G02
FOCAL8-284	8/E EAE Routine for FOCAL	D01, F02, G06
FOCAL8-285	Online Graph - With Self Determining Scale Factor	D01, G02
FOCAL8-286	Arithmetic Practice	D01, G02
FOCAL8-287	CC-FOCAL-Q	D01, F02
FOCAL8-288	FSPACE - Space Command for FOCAL '69	D01, F02, G02

* Same DECtape; includes 8-608 and 8-609

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-289	TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible With the TTY Intercom Terminal to CDC6000 Computer Series	D01, F02, G02
FOCAL8-290	Kolmogorov-Smirnov Test for Normality	D01, G02
FOCAL8-291	DRANO	D01, F02
FOCAL8-292	CHCIG8	D01, F06, G06
FOCAL8-293	A Laboratory and Real Time Patch with FNEW FOCAL 5/69	D01, F02, G06
FOCAL8-294	Real Time FOCAL on the PDP-8 Computer	D01, F06
FOCAL8-295	ATTND - Monthly Attendance Reporting Module	D01, G02
FOCAL8-296	FOCALINUS - Molecular Geometry Calculator	A01, F02, G02, W00
FOCAL8-297	LUNGS - A System of Programs for the Calculation of Selected Cardiorespiratory Parameters	D01, F02, G06
FOCAL8-298	Critical Points of a P (x) of Degree N (Real Coefficients)	D01, G02
FOCAL8-299	FOPAY - Weekly Payroll Deductions and Computations	D01, G02

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-1	NC	$	$	$ NC	$	$	$	$	$	$	
FOCAL8-2	NC	1.		NA							
FOCAL8-3	NC			NC							
FOCAL8-4	NC			NC							
FOCAL8-5	NC		1.	NC							
FOCAL8-6	NC	1.		NA							
FOCAL8-7	NC	1.		NC							
FOCAL8-8	NC	1.	5.	NC							
FOCAL8-9	NC		5.	NC							
FOCAL8-10	NC			NC							
FOCAL8-11	NC	1.	5.	NC							
FOCAL8-12	NC			NC							
FOCAL8-13	NC			NC							
FOCAL8-14	NC			NC							
FOCAL8-15	NC			NC							
FOCAL8-16	NC	1.	5.	NC							
FOCAL8-17	NC			NA							
FOCAL8-18	NC			NC							
FOCAL8-19	NC		1.	NA							
FOCAL8-20	NC		1.	NC							
FOCAL8-21	NC			NC							
FOCAL8-22	NC			NC							
FOCAL8-23	NC			NC							
FOCAL8-24	NC			NC							
FOCAL8-25	NC			NC							
FOCAL8-26	NC		1.	NA							
FOCAL8-27	NC			NC							
FOCAL8-28	NC			NC							
FOCAL8-29	NC			NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-30	NC	$	$	$ NC	$	$	$	$	$	$	
FOCAL8-31	NC			NC							
FOCAL8-32	NC			NA							
FOCAL8-33	NC			NC							
FOCAL8-34	NC			NC							
FOCAL8-35	NC			NC							
FOCAL8-36	NC			NC							
FOCAL8-37	NC			NC							
FOCAL8-38	NC			NC							
FOCAL8-39	NC			NC							
FOCAL8-40	NC		3.	NA							
FOCAL8-41	NC		1.	NC							
FOCAL8-42	NC		1.	NC							
FOCAL8-43	NC			NC							
FOCAL8-44	NC			NC							
FOCAL8-45	NC			NC							
FOCAL8-46	NC			NC							
FOCAL8-47	NC			NC							
FOCAL8-48	NC		1.	NC							
FOCAL8-49	NC		1.	NC							
FOCAL8-50	NC		2.	NC							
FOCAL8-51	NC	1.		NA							
FOCAL8-52a	NC	1.	5.	5.	5.	17.	5.	15.			Bin or src files on DECtape or LINCtape
FOCAL8-53	NC			NA			5.	15.			On 1 LINCtape
FOCAL8-54	NC		1.	NA							
FOCAL8-55	NC		2.	NC							
FOCAL8-56	NC		1.	NC							
FOCAL8-57	NC	1.	5.	NC							
FOCAL8-58	NC			NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-116	NC	$ 1.	$	$ NC	$	$	$	$	$	$	
FOCAL8-117	NC		1.	NC							
FOCAL8-118	NC		3.	NC							
FOCAL8-119	NC		2.	NC							
FOCAL8-120	NC		1.	NC							
FOCAL8-121	NC		1.	NC							
FOCAL8-122	NC		1.	NC							
FOCAL8-123	NC	1.	5.	NC							
FOCAL8-124	NC		2.	NC							
FOCAL8-125a	NC		1.	NC							
FOCAL8-126	NC		1.	NC							
FOCAL8-127	NC		1.	NC							
FOCAL8-128	NC		1.	NC							
FOCAL8-129	NC		1.	NA							
FOCAL8-130	NC		1.	NC							
FOCAL8-131	NC		1.	NC							
FOCAL8-132	NC		5.	NC							
FOCAL8-134	NC		1.	NC							
FOCAL8-135	NC	1.		NC							
FOCAL8-136a	NC	1.		NA							
FOCAL8-137	NC		1.	NA							
FOCAL8-138	NC		1.	NC							
FOCAL8-139	NC	1.		NC							
FOCAL8-141	NC	1.	5.	NC							
FOCAL8-142	NC		1.	NC							
FOCAL8-143	NC		1.	NC							
FOCAL8-144	NC			NA	5.	17.					On 1 DECtape
FOCAL8-145	NC			5.	5.	17.					On 1 DECtape
FOCAL8-146	NC		1.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE BIN	PAPER TAPE ASCII	LISTING	DECTAPE U/S	DECTAPE D/S	LINCTAPE U/S	LINCTAPE D/S	MAGTAPE U/S	MAGTAPE D/S	OTHER INFORMATION
FOCAL8-147	NC	$	$ 1.	$ NA	$	$	$	$	$	$	
FOCAL8-148A	NC	1.		NA	5.	17.					4K } DECtape is
FOCAL8-148B	NC	1.		NA							8K } Source for both
FOCAL8-149	NC		1.	NA							
FOCAL8-150	NC	1.	1.	NC							
FOCAL8-151	NC		2.	NC							
FOCAL8-152	NC		1.	NC							
FOCAL8-153	NC	1.		NC							
FOCAL8-154	NC	1.	5.	5.							
FOCAL8-155	NC		1.	NA							
FOCAL8-156	NC		1.	NC							
FOCAL8-157	NC	1.		NC							
FOCAL8-158	NC		1.	NC							
FOCAL8-159A	NC			NC							
FOCAL8-159B	NC			NC							
FOCAL8-159C	NC			NC							
FOCAL8-160	NC		2.	NC							
FOCAL8-161	NC		1.	NC							
FOCAL8-162	NC	1.	5.	NC							
FOCAL8-163	NC		3.	NA							
FOCAL8-164	NC	1.		NC							
FOCAL8-165	NC		1.	NC							
FOCAL8-166A	NC		1.	NC							
FOCAL8-166B	NC		1.	NC							
FOCAL8-167	NC		5.	NC							
FOCAL8-168	NC		1.	NC							
FOCAL8-169	NC		1.	NC							
FOCAL8-170	NC		5.	NA	(COMPLETE SET) OR						
FOCAL8-170.1	NC		1.	NA							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-222	NC	$ 1.	$	$ NC	$	$	$	$	$	$	
FOCAL8-223	NC	1.		NA							
FOCAL8-224	NC	1.	5.	NC							
FOCAL8-225	NC			NC							
FOCAL8-226	NC	1.	5.	NC							
FOCAL8-227a	NC	1.		10.	5.	17					
FOCAL8-228	NC		1.	NC							
FOCAL8-229	NC		2.	NC							
FOCAL8-230	NC			NC							
FOCAL8-231	NC	1.	5.	NC							
FOCAL8-232	NC		1.	NC							
FOCAL8-233	NC	1.	5.	NC							
FOCAL8-234	NC		1.	NC							
FOCAL8-235	NC		1.	NC							
FOCAL8-236	NC		3.	NC							
FOCAL8-237	NC		1.	NC							
FOCAL8-238	NC		1.	NC							
FOCAL8-239	NC		1.	NC							
FOCAL8-240	NC		1.	NC							
FOCAL8-241	NC		1.	NC							
FOCAL8-242	NC		3.	NC							
FOCAL8-243	NC		5.	NC							
FOCAL8-244	NC		1.	NC							
FOCAL8-245	NC		1.	NC							
FOCAL8-246	NC		1.	NC							
FOCAL8-247	NC	1.	5.	NC							
FOCAL8-248	NC		5.	NC							
FOCAL8-249a	NC		1.	NC							
FOCAL8-250	NC		1.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-251	NC	$	$2.	$ NC	$	$	$	$	$	$	
FOCAL8-252	NC	1.	5.	NC							
FOCAL8-253	NC		1.	NC							
FOCAL8-254	NC	1.	5.	NA							
FOCAL8-255	NC		1.	NC							
FOCAL8-256	NC	1.		NC							
FOCAL8-257	NC			NC							
FOCAL8-258	NC		2.	NC							
FOCAL8-259	NC	1.	5.	NA							
FOCAL8-260	NC		1.	NC							
FOCAL8-261	NC		1.	NC							
FOCAL8-262	NC		2.	NC							
FOCAL8-263	NC		1.	NC							
FOCAL8-264	NC		5.	NC							
FOCAL8-265	NC		1.	NC							
FOCAL8-266	NC			NA	5.	17.					
FOCAL8-267	NC		1.	NA							
FOCAL8-268	NC		5.	NC							
FOCAL8-269	NC			NA	5.	17.					Tape with 8-608 & 609
FOCAL8-270	NC		5.	NA							
FOCAL8-271	NC			NA							
FOCAL8-272	NC		1.	NC							
FOCAL8-273	NC		1.	NC							
FOCAL8-274	NC	1.		NC							
FOCAL8-275	NC		1.	NC							
FOCAL8-276	NC		1.	NC							
FOCAL8-277	NC		1.	NC							
FOCAL8-278	NC		2.	NC							4K Paper tape - $1.00 8K Paper tape - $1.00
FOCAL8-279	NC		1.	NC							

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-280	NC	$1.	$1.	$ NC	$	$	$	$	$	$	
FOCAL8-281	NC	1.	1.	NC							
FOCAL8-282	NC		1.	NC							
FOCAL8-283	NC	1.	5.	NC							
FOCAL8-284	NC	1.	5.	NC							
FOCAL8-285	NC		1.	NC							
FOCAL8-286	NC		1.	NC							
FOCAL8-287	NC	1.		NC							
FOCAL8-288	NC	1.	5.	NC							
FOCAL8-289	NC	1.	1.	NC							
FOCAL8-290	NC		1.	NC							
FOCAL8-291	NC	1.		NC							
FOCAL8-292	NC	1.	5.	NC							
FOCAL8-293	NC	1.	5.	NC							
FOCAL8-294	NC	2.		NC							
FOCAL8-295	NC		1.	NC							
FOCAL8-296	NC	1.	5.	NA							
FOCAL8-297	NC	1.	5.	NC							
FOCAL8-298	NC		1.	NC							
FOCAL8-299	NC		1.	NC							

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N/A - Not Available

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A complete set of all current FOCAL8 write-ups is available for a service charge of $35.00.

FOCAL8 PROGRAM ABSTRACTS

DECUS NO. FOCAL8-1

A Pseudo Random Number Generator for the PDP-8 for use with FOCAL

Gary A. Griffith, Georgia Institute of Technology, Atlanta, Georgia

A pseudo random number generator adapted to the PDP-8 computer has been tested for randomness and uniformity. The test for randomness shows a definite bias. However, this generation algorithm compares favorably with others presently being used. It was written to replace the random number generator of the 4K FOCAL language.

Minimum Hardware: 4K PDP-8
Source Language: 4K FOCAL

DECUS NO. FOCAL8-2

XOD Modification for use with FOCAL

Georgia Institute of Technology
Submitted by: John Alderman, Applied Data Research, Atlanta, Georgia

This program contains modifications to XOD (DECUS NO. 8-89) which allow it to be used to debug FOCAL. It also contains certain changes for the command character set which make them more like ODT-2, which is desirable for installations with many inexperienced users.

DECUS NO. FOCAL8-3

DISK FOCAL

D. E. Wrege and J. C. Alderman, Georgia Institute of Technology, Atlanta, Georgia

A dialect has been developed utilizing the disk (DF32 or RF08) for both text and variable storage in a 4K PDP-8. Variable storage is via the arrayed function FNEW, while text is stored via the LIBRARY command which has been pre-empted for the purpose. Limitations of programming complexity in the current version limit the user to about 6 complete FOCAL program images and 1320 DISK FNEW variables (8K of the disk). A trivial modification to the coding will allow the user to expand the disk area. The package was written for the DF32, but changes required for the RF08 are easily made by a user of such. The Disk/DECtape Monitor does not protect the user's files generated by the use of the package, but a program to implement the protection is under development.

DECUS NO. FOCAL8-4

PRIME PLOTS

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program plots successive primes while cycling over a specified prime interval. The interpretation of the results are left to the user.

DECUS NO. FOCAL8-5

The Sumer Game

Doug Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Canada

This is a simulation program/game which will run on a minimal PDP-8 system. The economy of a Sumerian city in the year 3000 B. C. is simulated in the fashion of a modern-day "business game."

DECUS NO. FOCAL8-6

FOCAL-8 Patch for LINC-8 Display

Peter Goldstern, Digital Equipment Corporation

This patch causes FDXS and FDYS commands in FOCAL to be displayed on the LINC-8 Display. This patch applies only to DEC-08-AJAD-PB, FOCAL.

Minimum Hardware: LINC-8
Other Programs Needed: FOCAL DEC-08-AJAD-PB

DECUS NO. FOCAL8-7

STRIP FOCAL: Storage of Data Arrays in FOCAL

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

This program, written for FOCAL W on an 8K machine, accepts data from paper tape on the high speed reader, and displays it on the Type 34 display unit. The data is stored in upper core, or on the disk, using the FNEW array. An ERASE or ERASE ALL command will not wipe out the stored data. Several sets of data may be stored in different sections of the array with the user keeping track of the indices.

Other Programs Needed: FOCAL W

DECUS NO. FOCAL8-8

Magtape FOCAL

J. C. Alderman, Applied Data Research, Atlanta, Georgia

A sophisticated handler package for the TC58 IBM compatible magtape controller in the FOCAL language. Data is transmitted to/from the FNEW arrayed storage in FIELD 1. The features of I/O overlap with program execution, defeatable error diagnostics, and programmable tape density and unit selection have been incorporated into the coding. Syntax is via the LIBRARY command, and there is extensive error checking of user calls.

The FIELD 1 resident portion of the magtape handler is removable by other users, and the result is a general purpose LIBRARY command handler package, capable of being linked to any device using the interrupt. A functional argument is transmitted to the FIELD 1 coding, and any number of numerical arguments may be evaluated.

DECUS NO. FOCAL8-9

Hexapawn

Ralph Mayer
Submitted by: Walter Koetke, Lexington High School, Lexington, Massachusetts

The object of this program is to have the computer "learn" to play a game, called Hexapawn.

Hexapawn is played on a square board and each player has three pawns. A pawn can move forward to an empty space or diagonally forward to capture an opponent's pawn. One wins by having any one of his pawns reach the opponent's side of the board, by making it impossible for the opponent's pawn to move, or by capturing all of the opponent's pawns.

The computer "learns" to play this game by remembering each of the possible board configurations when it is encountered during a game, and then determining and remembering all of the possible moves applicable to each board configuration.

Storage Requirement: 8K

DECUS NO. FOCAL8-10

Patch to FOCAL W for LINC-8 A-D Converter

Dr. T. Nichols, Department of the Army, U. S. Army Natick Laboratory, Natick, Massachusetts

This patch allows FOCAL W programs to use the LINC-8 analog to digital converter.

Execution of each function call requires approximately 10 milliseconds, limiting the maximum sampling rate to 100 SPS.

Minor changes to the patch will allow the execution of any single LINC instruction (stored at LINSTR) by FOCAL programs.

DECUS NO. FOCAL8-11

EAE Routines for FOCAL

J. Dwight Aplevich, University of Chicago, Committee on Mathematical Biology, Chicago, Illinois

This patch replaces the floating point system in FOCAL with one nearly identical to the standard EAE Floating Point package. A new floating integer subroutine is included, as well as a multiplicative-congruential pseudo random number generator. New FITR and FRAN routines are included.

Minimum Hardware:	PDP-8 with type 182 EAE
Other Programs Needed:	FOCAL DEC-08-AJAB (4/29/68)
Storage Requirement:	6400-7577; 5753-5777
Restrictions:	Will NOT fit other versions of FOCAL
Source Language:	PAL

DECUS NO. FOCAL8-12

QUIP1 - Quick Plot in Quadrant 1

D. A. Dalby, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

The implementation of an additional extended function named "FLOT" in FOCAL to generate a straight line plot on a CalComp 563 incremental plotter considerably increases the usefulness of FOCAL for simple plotting applications. QUIP is a program in FOCAL language which demonstrates one use of the FLOT function: to generate a general XY plot in the first quadrant. The user simply types the control parameters and (x,y) values on the keyboard. An infinite set of plotting symbols of continuously variable size, width-to-height ratio, symbol order (number of strokes), and positive (counter-clockwise) or negative (clockwise) rotation is available by simply typing the appropriate parameters on the keyboard.

Minimum Hardware:	PDP-8, ASR33, CalComp 563 Incremental Plotter

DECUS NO. FOCAL8-13

3D PLOTTER

John M. Jamieson, Georgia Institute of Technology, Atlanta, Georgia

This program, written in FOCAL, plots a function, Z, of two other variables, X and Y, on the memoscope or X-Y plotter. The function must be written in Cartesian space.

Minimum Hardware:	8K PDP-8, storage scope and/or X-Y plotter, ASR33, HSR
Other Programs Needed:	FNEW array, Extended FOCAL for some functions
Storage Requirement:	8000 words

DECUS NO. FOCAL8-14

Least Squares Fit to a Straight Line

Edward T. Chow, Georgia Institute of Technology, Atlanta, Georgia

This is a program using the principle of least squares to fit a straight line to a set of up to 35 experimental data points.

The program requires one pass of the data. At the end of the pass the output gives the values of the slope and the intercept of the straight line equation. In addition, the calculated values of the experimental data based on the straight line equation are pointed out. Finally, the program gives the value of R which is a criterion of fitness of equation to the input data.

Other Programs Needed: FOCAL DEC-08-AJAB

DECUS NO. FOCAL8-15

Least Squares Fit to a Cubic Polynomial

Edward T. Chow, Georgia Institute of Technology, Atlanta, Georgia

This is a program using the method of least squares to fit a cubic polynomial to a set of experimental data. The program demands two passes of the data for its completion; however, the coefficients of the polynomial are outputted after the first pass, and at the end of the second pass the output gives the value of R which is a criterion of fitness and gives the calculated values of the experimental data based on the cubic polynomial.

In addition, a section of the program can be used as a self-contained program for solution of a set of N by N linear equations.

Other Programs Needed: FOCAL DEC-08-AJAB

DECUS NO. FOCAL8-16

One-Sample Statistics: Two-Sample Statistics: Welch Procedure; One-Way Analysis of Variance; Sheffe's Contrast Between Means

M. J. McKeown, University of Chicago, Department of Obstetrics and Gynecology, Chicago, Illinois

A three part program used to perform one-sample and two-sample statistics, Welch Procedure; One-Way Analysis of Variance; and Sheffe's Contrast between Means, which allows one to investigate more thoroughly the source of the difference between group means.

DECUS NO. FOCAL8-17

FOCAL: How to Write New Subroutines and Use Internal Routines

Doug Wrege, Engineering Experiment Station, Georgia Institute of Technology, Atlanta, Georgia

This document is an attempt to explain how user-developed software can be interfaced to the basic FOCAL package, without requiring the user to spend valuable time trying to understand all of its detailed workings. Section II deals with a general discussion of how FOCAL works, in a descriptive fashion. Section III is concerned with the philosophy of the language, and the last few sections are technically oriented toward helping the user actually code his additions. Several examples and ready-coded routines, which may be used to simplify the user's problems are included.

An extension of this document, which includes most of the discussions contained in this volume, is offered as DECUS NO. FOCAL8-271. (See abstract)

DECUS NO. FOCAL8-18

T-ASK

J. Alderman, Applied Data Research, Atlanta, Georgia

This subroutine, available in two versions, Standard FOCAL Version and FNEW Array FOCAL Version, allows the user to enter an input unit, as well as a number, and converts the number to a common unit before returning to the calling program. It is particularly useful for programs utilizing TIME as an input parameter, since the program will convert the following units to seconds: YEARS, DAYS, HOURS, MINUTES, SECONDS, AND FORTNIGHT.

DECUS NO. FOCAL8-19

Least Squares Fit to an Exponential

Submitted by: J. W. Lynn, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

This program is used in conjunction with "FOCAL" to make the best two parameter least squares fit of

$$Y = A * EXP (ALPHA * X)$$

to the user's data.

DECUS NO. FOCAL8-20

MULTIPULSE

Chris Hamilton, Georgia Institute of Technology, Atlanta, Georgia

A FOCAL program for use on PDP-8 to check the differential linearity of a multichannel pulse height analyzer.

DECUS NO. FOCAL8-21

MULTIPULSE-2

Chris Hamilton, Georgia Institute of Technology, Atlanta, Georgia

MULTIPULSE-2 (M-2) will calculate the differential non-linearity of a multichannel pulse height analyzer using as data a Compton spectrum on paper tape which has been expanded through all channels whose channel width deviation is under study.

DECUS NO. FOCAL8-22

Monte Carlo Solution to Neutron Penetration Problem

Bryan W. McGhee, Georgia Institute of Technology, Atlanta, Georgia

This display is a one axis display (Z coordinate only) of each scattering event - though scattering is calculated in 3-dimensions. The axis shifts upward for each new neutron to facilitate ease of following collisions.

DECUS NO. FOCAL8-23

Seismic Refraction Sloping Layer Program

David D. Prentiss, Atlantic Oceanographic Laboratory, Bedford Institute, Dartmouth, Nova Scotia, Canada

This program, developed for a PDP-8 4K machine, requires the full library of functions. It calculates a seismic refraction model using the slope-intercept method of M. Ewing, G. P. Woollard and A. C. Vine proposed in 1939 and the notation of J. I. Ewing's article on marine seismic refraction and reflective methods appearing in Volume III of "The Sea."

Source Language: FOCAL, 8/68

DECUS NO. FOCAL8-24

GRADE: A Grade Averaging and Display Program

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

This program will average grades from a number of quizzes, taking into account weighting factors of relative importance between quizzes, and plot a histogram of the number of grades in a given percentile.

Minimum Hardware: PDP-8 with extended memory (4K if no display required), Type 34 Display

Source Language: FOCAL W

DECUS NO. FOCAL8-25

Payroll Calculations (California, 1968)

G. L. Helgeson, Helgeson Nuclear Services, Inc., Pleasanton, California

This routine is used to calculate payrolls. It is based on the California State Unemployment Insurance rate, FICA rate and withholding tax.

This program could be modified easily to fit the rules of any particular state. If some of the pay ranges would not be used, they could be omitted from the two tables, making more room for other routines, such as providing running totals on gross pay, deductions, and net pay.

Source Language: FOCAL, 1968

DECUS NO. FOCAL8-26

Curve Fitting

Richard Rothman, Groton School, Groton, Connecticut

This program finds the best curve of a set of points. There are three types of curves involved: 1) Exponential Curve, $Y = Ae^{BX}$; 2) Power Curve $Y = AX^{N}$; 3) Linear Line $Y = MX + B$.

DECUS NO. FOCAL8-27

Δ - Y Complex; Y - Δ Complex; Series Resonant Circuit Analysis

David H. Tyrrell, Middlesex County College, Edison, New Jersey

Δ - Y Complex - This program does a DELTA-WYE transformation for A-C circuits.

Y - Δ Complex - This program does a WYE-DELTA transformation for A-C circuits

Series Resonant Circuit Analysis - This program computes resonant frequency, bandwidth, Q, and values of inductive and capacitive reactance of resonance for a given R-L-C series circuits. It also produces, upon request, a table of impedance and phase angle for 10 points each side of the resonant frequency. Distance between points is determined by a user inputted DELTA-F.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-28

Column Width; Traverse; Least Square "Linear Fit;" Nozzle Weight Flow; Filter Design; Ohm's Law

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Column Width - Used for typesetting calculations

DECUS NO. FOCAL8-28 (Continued)

Traverse - A civil engineering and surveying application to compute a closed traverse given bearings and distances.

Least Square "Linear Fit" - Finds slope and Y-intercepts for the equation Y=MX+B given a set of data observations.

Nozzle Weight Flow - Checks inlet pressure ratio and calculates the weight flow through the nozzle (from Hamilton Standard).

Filter Design - Plots filter output as well as numerical answers to a digital filter design problem.

Ohm's Law - Computes Ohm's Law.

DECUS NO. FOCAL8-29

Second Order Differential Equation

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

This is a routine to solve $\frac{D^2X}{DT^2}$ -K1 $\cdot\frac{DX}{DT}$ + K2 . X = Ø given K1, K2, and initial values for X, $\frac{DX}{DT}$, and $\frac{D^2X}{DT^2}$. The user also selects the time interval DT. The result is plotted on the TTY from time zero until interrupted.

A check is made for off-scale values.

DECUS NO. FOCAL8-30

One Line Routines; X^3 and Circle; Superposition; Circle

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

One Line Routines - Demonstrates ability to create a one line program loop to plot using library functions of the FOCAL language.

X^3 and Circle - Use of subroutines if function plotting.

Superposition - The ability to superimpose multiple functions with different print characters in one output plot.

Circle - A circle of radius 10 plotted by residuals.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-31

Sines; Factors; Figure Eight; Right Triangle Solutions

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Sines - Plotting several variables using sine functions.

Factors - Determines whether a number is prime or gives its factors.

Figure Eight - Will plot various sizes of figure eights by means or residuals. This is represented by a simple fourth order equation.

Right Triangle Solutions - Applies trigonometry relations and the Pythagorean theorem for a right triangle.

DECUS NO. FOCAL8-32

Translation Table - French

Submitted by: Iroquois Falls and Calvert District High School, Iroquois Falls, Ontario, Canada

FOCAL commands translated into French.

DECUS NO. FOCAL8-33

Square Matrix Multiply; Prime Number Generator; Least Common Multiple; Base to Base Integer Conversion; Repeating Decimal

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Square Matrix Multiply - The arduous task of multiplying two square matrices is quickly done by this FOCAL Matrix Multiplication routine.

Prime Number Generator - The Prime Number Generator is a program which will accept a number, N, and type out all primes less than that value. As soon as the program is finished it loops back and starts over again by asking for N.

Lease Common Multiple (LCM) - The LCM routine is a neat, short program which will compute the LCM of any number of positive integers.

Base to Base Integer Conversion - The FOCAL Base to Base Conversion routine will convert any positive integer less than 2048 from one base system to another.

Repeating Decimal Program - This routine computes the decimal equivalent to any rational number whose absolute value is less than 1.

DECUS NO. FOCAL8-34

Simultaneous Equations; Abbreviated Simultaneous Equations; Curve Fittings

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Simultaneous Equations - A familiar multi-variable problem is solved for 1st - 6th order equation sets (9th order if extended functions are gone).

Abbreviated Simultaneous Equations

Curve Fittings - Plot of exponential equation.

DECUS NO. FOCAL8-35

Rootfinder Program

Ron Dorman, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

The Rootfinder program is a simple procedure, for use in determining the real roots of any suitable function. The program uses a conventional search to find root-containing intervals followed by a binary search (successive approximation method) to converge on the root value.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-36

Determinot Program

Ron Dorman, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

The Determinot program is a simple program which may be used to find the determinant of a square matrix of dimension 2 x 2 to 6 x 6. The method used in finding the determinant is based on the definition of the determinant and involves an N summation of products of N matrix terms with the proper inversion sign.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL 1968

DECUS NO. FOCAL8-37

N-th Degree Polynomial Data Point Fitting Routine; N-th Degree Polynomial Data Point Fitting Routine with RMS Error

R. E. McCullough, University of Colorado, Denver, Colorado

N-th Degree Polynomial Data Point Fitting Routine - This program accepts the x- and y- coordinates for an unlimited number of data points and calculates for the equation

$$Y = A_0 + A_1X + A_2X^2 + \ldots + A_NX^N,$$

the coefficients A_N which best fit the equation to the data points. The fitting criterion is "least squares." The program allows the user to select the degree, N, of the fitting equation. N may be as large as 7.

N-th Degree Polynomial Data Point Fitting Routine with RMS Error - This program is the same as N-th Degree Polynomial Fitting Routine except that it calculates the RMS error between the y-coordinates of the data points and the evaluated fitting equation. It will accept only a limited number of data points and the maximum equation degree allowed is inversely related to this number.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-38

Magic Square Generator

Doug Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Canada

The magic square generator will generate an odd order magic square of the indicated size (11 x 11 is the largest that will fit unless the format specification in line 2.8 is altered), using a set of sequential integers, beginning with the number specified.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-39

Rectangular to Polar Conversion; Polar to Rectangular Conversion

David H. Tyrrell, Middlesex County College, Edison, New Jersey

Rectangular to Polar Conversion - Converts complex numbers in rectangular form to polar form.

Polar to Rectangular Conversion - Converts complex numbers in polar form to rectangular form.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-40

Simple Chi-Square Test

Michael J. McKeown, University of Chicago, Chicago, Illinois

The program will type out the data matrix and cell contents. Each cell will contain two values; O = xxx.xxx and E = xxx.xxx. The "O=" number is the "OBSERVED" value which was typed in by the user. The "E=" value is the expected value calculated by the program. The program will also type out row sums (RS=) and column sums (CS=), and the grand total (T=). The last line of output will be "X2=" and "DR=". These are the CHI-SQUARE and degrees of freedom.

Restrictions: Number of columns in matrix is limited to size of teletype paper
Source Language: FOCAL 1968

DECUS NO. FOCAL8-41

FRAN THE BARMAID

Dr. Murray Vernon King, Massachusetts General Hospital, Boston, Massachusetts

A demonstration program which uses the random number generator to choose cocktail ingredients and their quantities.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-42

The Hangman Game

Dan Miller, Glastonbury, Connecticut

The program allows the user to play the game of Hangman with the computer, that is, a word guessing game using a limited number of trials at the letters in the word. Will run in 4K if extended functions are removed.

Source Language: FOCAL8/68

DECUS NO. FOCAL8-43

A Collection of FOCAL Patches

Edward A. Taft, III, St. Mark's School, Southborough, Massachusetts

A collection of assembly-language patches designed to correct some errors and deficiencies in the FOCAL interpreter and to add some welcome FORTRAN-like versatility to the input and output.

These patches will operate properly with FOCAL, 8/68 (DEC-08-AJAC-PB) and with its 8K extension. It will also work in Field Ø of 2-user FOCAL, though not Field 1.

DECUS NO. FOCAL8-44

Magtape Analyser Using Universal I/O FOCAL

John C. Alderman, Jr., Applied Data Research, Atlanta, Georgia

This program sets up the tape unit to read one record 1000 decimal words (2000 characters) long into Field 1. After the record is read, the status register contents are printed in octal, and the number of characters computed from the remainder in the word-count address location. The number of characters is then printed in decimal. A routine is also available to print the contents of the record, two-characters-per-word in octal.

Minimum Hardware: 8K PDP-8 with TC-58/TU-2Ø (or TU-2ØA)
Other Programs Needed: Universal I/O Handler for FOCAL (DECUS NO. FOCAL8-45)
Source Language: FOCAL W

DECUS NO. FOCAL8-45

Universal I/O Handler for FOCAL

John C. Alderman, Jr., Applied Data Research, Atlanta, Georgia

The Universal I/O Handler for FOCAL makes it possible to write the hardware MAINDEC in a high-level language, and with the possibility that maintenance people can change, or write specific test routines in FOCAL as required.

Source Language: FOCAL W

DECUS NO. FOCAL8-46

4-Digit, 12-Bit Word Practice

Thomas Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will drill the student in interpreting lamp patterns on console of PDP-8 computer. Lamp patterns are presented, and then the user types in the correct octal notation. A tally is kept of the users' responses.

Minimum Hardware: 8K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-47

Fourier Synthesis of a Square Wave

Thomas Ford, White Mountains Regional High School, Whitefield, New Hampshire

Fourier Synthesis of a Square Wave will give the plot of a wave form for a variable number of terms.

Source Language: FOCAL-69

DECUS NO. FOCAL8-48

A FOCAL Program to Determine Low-Frequency Loudspeaker Parameters Experimentally

Richard Merrill and Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This program is a FOCAL translation of a program devised by J. P. Ashley and M. D. Swan used in determining the low-frequency characteristics of loudspeakers for use in speaker system and enclosure design. The method allows determination of speaker parameters using a minimum of testing equipment.

Minimum Hardware: 4K PDP-8, LINC-8 or PDP-12
Source Language: FOCAL-69

DECUS NO. FOCAL8-49

Constantine's Function

Richard May, Digital Equipment Corporation, Maynard, Massachusetts

This routine is the solution and graphical output of the function:

$$M(\sigma,\gamma) = \frac{4}{\pi} * \sum_{n=0}^{\infty\,(N=6)} (-1)^N * e^{\frac{-(N^2+1)}{2}} * \left(\frac{2\sigma}{\gamma}\right)^2 \times \pi^2$$

as $\frac{2\sigma}{\gamma}$ varies from 0 to 1.

Source Language: FOCAL-69

July 1974

DECUS NO. FOCAL8-50

FOCAL Version of RC Active Filter

Bean and Roman, University of Texas, Southwestern Medical School, Dallas, Texas

This program is a FOCAL version of a program by Kincaid and Shirley as published in Electronic Design Volume 13. Derived from two fundamental equations, it can be used to design Butterworth or Chebyshev filters in either low-pass or high-pass versions of each. (See also FOCAL8-175)

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-51

FOCAL "WRITE" Patch

John Larkin, Technical Associates, Inc., Metairie, Louisianna

This patch changes the FOCAL "WRITE" routine to add blanks to paper tape generated by "WRITE," which corrects the "INPUT BUFFER OVERFLOW" error generated by loading long paper tapes into FOCAL-69.

Other Programs Needed: FOCAL-69
Restrictions: Will not run with 8K FOCAL

DECUS NO. FOCAL8-52a

FOCAL, 5/69
Edward A. Taft, III, Manchester, Massachusetts

This is a new version of FOCAL, based on FOCAL W, 8/69, which has been expanded and rewritten to remove numerous bugs and restrictions and to provide a large number of new commands and extended capabilities. Some of the new features are:

1) Better control over I/O devices, including high speed punch; 2) New I/O formats, including buffered input that accepts expressions as well as numbers, input and output of single ASCII characters, and a tabulation controller; 3) A group of "OPTION" commands that perform minor functions such as suppressing or restoring keyboard echo and changing I/O modes; 4) A more compact extended function package, resulting in an enlarged user area; also a command for deleting the extended functions; 5) Extended command formats, also a provision for using calculated line numbers.

A DECtape or LINCtape for this program and its 8K overlay (DECUS NO. FOCAL8-189) has been submitted by James Van Zee, University of Washington, for the convenience of PS/8-OS/8 programmers.

DECUS NO. FOCAL8-53

JMPFOCAL: FOCAL as a LINC-8 Subroutine

James E. Randall, Indiana University, Bloomington, Indiana

This system uses FOCAL W programs as LINC-mode subroutines on an 8K LINC-8. It allows FOCAL W to be used to process data stored on LINCtape.

The FOCAL programs are limited to 585 core locations and are slower than LINC floating point routines, but they are easy to write and to format.

Minimum Hardware: LINC-8 with 8K of memory
Other Programs Needed: User written LINC and FOCAL programs
Source Language: LAP6

DECUS NO. FOCAL8-54

Channel Information and Inverted Histogram Plot

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will accept up to 36 channels of information stored as A (I) during 'T' passes. It will then plot an inverted histogram using the symbol ' [ ],' spacing through vacant channels, and subtracting one count till all channels are vacant.

Source Language: FOCAL-69

DECUS NO. FOCAL8-55

Multichannel Analyzer

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This general program, Multichannel Analyzer, also includes a specialized version for the reduction of raw grades from the teacher's rank book to the letter grades specified for report cards. The method of visualizing scores is entirely the work of Kenneth L. Russell of Sam Houston State Teachers College, and quite adequately described in his publication 'Visual Grading' available from Educational Filmstrips, also of Huntsville, Texas.

The program will operate in 4K with the extended functions retained (they are not used) for at least 32 sets of data.

Source Language: FOCAL-69

DECUS NO. FOCAL8-56

Merchandise Price Tags

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program represents a preliminary effort to use the FOCAL language for the solution of a business oriented problem. With minimum input, the program will generate merchandise price tags, including the merchant's per-package-cost in a convenient code.

Source Language: FOCAL -69

DECUS NO. FOCAL8-57

FOCAL Display on a 338

David Whitely, International Computers Limited, Kidsgrove, Stoke-on-Trent, England

This program enables a vector display to be generated on a 338 using the instructions already available in FOCAL. It is also possible to draw blank vectors and to erase the display file under program control.

Minimum Hardware: 8K PDP-8, 338 Display
Source Language: FOCAL

DECUS NO. FOCAL8-58

A Patch to FOCAL W to use the LINC-8 Display

Peter Lemkin, NINDS PRB, National Institute of Health, Bethesda, Maryland

This program is a patch for FOCAL W (8/68) which lets users with LINC-8's use the LINC point display in FOCAL programs. The user sets up and intensifies the X and Y coordinates the same way as for the PDP-8 display except for the following differences:

A. X and Y coordinates are reversed so that for example:

SET H = FDXS(X)+FDIS(Y)
should be rewritten as
SET H = FDXS(Y)+FDIS(X)

B. The range of X is from 0 to 512_{10}
and the range of Y is from -256_{10} to $+256_{10}$

The patch clobbers the ARCTAN FOCAL function. If the ARCTAN function is needed, it can be computed from the FEXP function.

Source Language: FOCAL W

DECUS NO. FOCAL8-59

FOCAL Overlay Common Area for 4K Core Memory

Herbert Zimmermann, Digital Equipment GmbH, Koln, Germany

This program is an overlay which implements the common area with the function FNEW. Two versions of the overlay tape are available, one for FOCAL without extended functions, and one for FOCAL with extended functions. The overlay "common area" is read in in a normal way.

Minimum Hardware: 4K PDP-8
Other Programs Needed: Binary loader; FOCAL (DEC-08-AJAE-PB)
Source Language: FOCAL

DECUS NO. FOCAL8-60 (See DECUS NO. 8-251)

A System for Production of Problem Sets with Individualized Data

H. Bradford Thompson, Department of Chemistry, University of Toledo, Toledo, Ohio

This system produces problem sets for use in science and mathematics instruction, in which input data are changed for each student. Two programs are involved, (1) a FOCAL program into which the instructor inserts the algebra required to perform the calculations, and (2) a program which accepts a text with data positions marked, and then inserts individualized data from the FOCAL program (without the answers) and prints the copies.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL (Any version)
Source Language: FOCAL, PAL III

DECUS NO. FOCAL8-61

Least Square Fit to a Polynomial

Adrian Demayo, Department of Energy, Mines and Resources, Inland Water Branch, Water Quality Division, Ontario, Canada

Given L1 pairs of points $X_i(obs)$, $Y_i(obs)$ ($i=1 \ldots L1$) this program finds the coefficients B_i expression:

$$Y_j(calc) = \sum_{i-1}^{L} B_{i-1} X_j^{i-1} \quad (obs) \qquad L = NA \ldots NB$$
$$j = 1 \ldots L1$$

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-62

The FOCAL TGH Clinical Package

H. Dominic Covvey, Toronto General Hospital, Toronto, Canada

This is a package of biomedical programs used for a variety of purposes, such as: calculation of gas concentration in the blood; volume measurements of the left ventricle; intake analog data; statistical analysis on pairs of data; washout studies; respiratory physiology; and a demonstration program which gives the first four or so components of the fourier series for a square wave.

Source Language: FOCAL

DECUS NO. FOCAL8-63

CURFIT

Donald L. Shirer, Valparaiso University, Valparaiso, Indiana

CURFIT is a program written in the FOCAL language which fits weighted or unweighted data to a straight line on a Cartesian, log-log or semilog graph. It calculates the slope

DECUS NO. FOCAL8-63 (Continued)

and intercept of the line, the standard error in these values, plus other measures of the "goodness" of fit. Values may be added or deleted from the data list easily, and there is no limit to the number of sample data pairs.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-64

Newton-Raphson Method for Determination of Polynomial Roots

Dan C. Stanzione, Electrical Engineering, Clemson University, Clemson, South Carolina

This program is used to determine the 'n' zeroes of a polynomail, f(x), where

$$f(x) = a_0 + a_1x + \ldots + a_nx^n$$

where a_0 and a_n are not equal to zero and a_0, $a_1 \ldots$, a_n are in general complex.

Minimum Hardware: Basic PDP-8 configuration
Restrictions: Delete extended functions when running on 4K machine
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-65

Kruskal-Wallis One Way Analysis of Variance by Ranks

Gene Sylwesiuk and Elliot N. Gale, SUNYAB, Department of Behavioral Science, Buffalo, New York

This is a statistical program which allows the user to test the difference between the means of k groups when the data are not parametric and are independent.

Minimum Hardware: PDP-8/S, ASR33
Restrictions: Delete extended functions
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-66

"QUICK SCAN" Using Scheffe's Calculation

W. P. Ronald, Canada Department of Agriculture, Research Station, Vancouver, British Columbia, Canada

This program is a modification of "Sheffe's Contrast Between Means" (FOCAL8-16), and is designed to be used in conjunction with FOCAL8-16, or with DECUS 5/8-9. Using the output from an analysis of variance calculation, it quickly supplies the user with a general picture of the significance of group mean differences, at any selected F level.

Storage Requirement: 41Ø locations
Restrictions: A large number of samples requires deletion of extended symbols
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-67

T-Test

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

This program is designed to calculate students' T- ratio for independent samples. The output format gives sample means and variances, standard error of the mean difference, the value of t, and the number of degrees of freedom upon which t is distributed.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-68

Determination of Roots of a Polynomial

A. E. Sapega, Trinity College, Hartford, Connecticut

This program will find all roots, real and complex, of a polynomial. The 4K version consists of four programs. Program I finds a real root. Program II divides the polynomial by the real root, so reducing the order of the polynomial by one. Program III finds complex roots after all real roots have been extracted. Program IV divides the polynomial by a pair of roots to reduce the order of the polynomial by two. An 8K version contains all the above parts in one program.

Minimum Hardware: 4K PDP-8
Restrictions: Delete extended functions for 4K version
Source Language: FOCAL-69

NOTE: When ordering please state whether 4K or 8K version is required.

DECUS NO. FOCAL8-69

Analysis of Variance

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

This program is designed to solve the analysis of variance problem for the two-factor completely randomized design, and to table the results of the analysis in a form acceptable for publication in many scientific journals. Both the input and output formats are designed for simplicity and ease of operation.

An alternate form of the program makes possible the evaluation of either one-factor or two-factor designs.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-70

Analysis of Variance Randomized Block "F" Test

C. T. Lund, Canada Department of Agriculture, Vineland Station, Ontario, Canada

The purpose of this program is to isolate variation in an experiment attributable to treatments and replicates, and test this variation for significance.

Minimum Hardware:	PDP-8/L, ASR33
Restrictions:	The block design must be complete
Source Language:	FOCAL 1968

DECUS NO. FOCAL8-71

FOCAL Golf Program for the PDP-8 (8K) Computer

Gilbert S. Fair, Digital Equipment Corporation, Northbrook, Illinois

This program simulates the playing of golf, including the shot selection options of club, power and direction together with numerous variations of these selections, to more closely resemble the actual experience of a golfer "on the links."

Minimum Hardware:	8K PDP-8, ASR33
Storage Requirement:	7000-8000 words (including FOCAL)
Miscellaneous:	Takes about one hour for 9 holes (dependent on user reaction)
Source Language:	FOCAL -69

DECUS NO. FOCAL8-72

General Least Squares Fit

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

Can be used to fit data to any arbitrary curve (line, exponential, polynomial, Gaussian, Lorentzian, etc.). Curve is specified by the calculation in group 3, so any curve that can be calculated can be fitted to data.

Minimum Hardware:	8K PDP-8
Source Language:	FOCAL

DECUS NO. FOCAL8-73

Real Matrix Inversion

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

Inverts a real, square matrix using FOCAL. This is essentially a translation of the IBM MINV.

Minimum Hardware:	PDP-8
Restrictions:	6 x 6 matrix is the largest that can be done with 4K
Source Language:	FOCAL

DECUS NO. FOCAL8-74

Linear Least Squares Fit

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

A short, fast simple linear least squares fit (linear regression).

Source Language:	FOCAL

DECUS NO. FOCAL8-75

Blackjack

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

A modified Blackjack game, written in FOCAL. The game contains standard Blackjack payoffs as well as a "double down" option on hands of 10 or 11.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL 8/68

DECUS NO. FOCAL8-76

Screening Regression

Dr. Robert G. Miller, 30 Juniper Lane, Glastonbury, Connecticut

This program performs a stepwise multiple linear regression analysis. For a dependent variable Y the program selects or screens from among a number of independent variables a subset (7 or less) of the total number of variables which contains most of the information of the entire set. There is no limit to the number of independent variables used.

Minimum Hardware:	PDP-8/L, ASR33
Storage Requirement:	4096 words
Restrictions:	The cross product matrix is required as input
Source Language:	FOCAL - 69

DECUS NO. FOCAL8-77

MARX: A Grading Program

Peter Smith, Noble and Greenough School, Dedham, Massachusetts

This program accepts marks for a class of a given number, for a given number of weighted quizzes and tests, and outputs in tabular form, the students' respective ranks, averages, and relation to the class average (plus or minus, as the case may be). In addition, it gives the class average, and a table showing the distribution of averages along a scale from flunk (below 6Ø) to 1ØØ.

Minimum Hardware:	PDP-8, ASR33
Source Language:	FOCAL

DECUS NO. FOCAL8-78

RACK-O

Daniel Miller, 30 Juniper Lane, Glastonbury, Connecticut

A computerized version of the Milton Bradley Company game RACK-O. The object is to try to put a "set" of numbers in numerical order (limitations are put on your changes) before the machine does.

Minimum Hardware: PDP-8, ASR33
Other Programs Needed: Pseudo random number generator (special binary tape for this program)
Source Language: FOCAL - 69

DECUS NO. FOCAL8-79

The Carnival Game

Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

The Carnival Game allows the user to play a gambling game involving three dice. Once started, the program produces a monolog explaining the principle and operation of the game.

Minimum Hardware: PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-80

Using the High Speed Punch with FOCAL

Harold Metcalf, Physics Department, SUNY Stony Brook, Stony Brook, New York

This program enables the use of the high speed punch in FOCAL by direct or indirect command, in much the same way that the asterisk enables the optical reader.

Minimum Hardware: PDP-8, high speed punch
Other Programs Needed: FOCAL - 69
Source Language: PAL III

DECUS NO. FOCAL8-81

FOCAL Lunar Landing Simulation (APOLLO)

James A. Storer
Submitted by: Walter Koetke, Lexington High School, Lexington, Massachusetts

This program realistically simulates an Apollo moon landing using NASA figures. It begins with module at Ø seconds, 120 miles above the moon, carrying 1600 pounds of fuel, with a velocity of 2600 miles per hour. Upon radar checks of velocity, altitude, remaining fuel, and time each 10 seconds, you may decide upon fuel rate for next time arrival. The object is to land safely on the moon.

Minimum Hardware: 4K PDP-8
Restrictions: Cannot retain FOCAL's extended functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-82

Physical Sine Curve Programs

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Consists of:

1) Simple Sine Man; 2) Damped Sine on Axis; 3) Sum Shaded Sines; 4) Plot and two physical sine curves; 5) Fourier Synthesis of a Square Wave.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-83

Gas Law Programs

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Consists of:

1) Ideal Gas Plot P/V; 2) Ideal Gas Volume vs. Temperature; 3) Real Gas Volume vs. Temperature.

Source Language: FOCAL

DECUS NO. FOCAL8-84

2D Plotter for Serial Experimental Data

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will accept and plot on TTY up to 40 sets of data (in 4K). The printout is organized to display the Cartesian Space by spacing through values of "Y" and line feeding through values of "X" where these may represent any physical quantities. Following the plotting of data, the display scale factor and the adjusted values for the plotter parameter are typed out by calling for the whole symbol table.

The program was designed to serve as a universal plotting routine in its own right, but is group numbered to facilitate incorporation into some other program as a dedicated display routine.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-85

Program Replication

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This is intended as a vehicle for the essential single line 06.01 which specifies the immediate-mode command.

The FOR command will cause the program presently in core to be typed out the specified number of times with the specified number of lines between each copy of the program.

DECUS NO. FOCAL8-85 (Continued)

The search feature was employed to facilitate cutting the TTY paper into individual pages.

The program as provided will make ten copies of itself as soon as it has loaded and the G followed by a CARRIAGE RETURN are read from the tape.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-86

KCF Temperature Conversion Table

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program expands the usefulness of the sample program listed in Introduction to Programming (DEC). Temperature conversion and table printout is available from any starting temperature (6 digit limit), in any size increment, to any higher temperature. The program may be used to generate tables of any range and subdivision for use in the field, or the range of immediate interest may be run as needed in the laboratory.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-87

Keyboard Readable Punch

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program should prove useful to users of paper tape who also have limited core storage. The routine operates manually from the TTY keyboard (LOCAL) to punch readable characters. Using this procedure, the leader portion of the paper tape can be perforated in a meaningful way for tape identification.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-88

Atomic and Molecular Transition Probabilities in FOCAL

Harold Metcalf, Physics Department, SUNY Stony Brook, Stony Brook, New York

This constitutes part of a series of programs for evaluating 3-J and 6-J symbols in the calculation of quantum mechanical matrix elements which was developed at the State University of New York at Stony Brook.

Source Language: FOCAL

DECUS NO. FOCAL8-89

The Recursive Evaluation of Functions

A. K. Head, C.S.I.R.O. Division of Tribophysics, Melbourne, Australia

The evaluation of functions by recursion is a technique which is not often used in computing, but it has proved to be the solution to two different problems in FOCAL. The first was the need for circular functions which were more accurate than the internal functions when using 4-word arithmetic (when the internal functions have only 3-word accuracy). The second was the need for functions which occupy less memory than the corresponding internal functions. A selection of some of the circular and hyperbolic functions which have been used are included in this program.

Source Language: FOCAL - 69

DECUS NO. FOCAL8-90

X-Y Plotter Patch for FOCAL '69

Roy H. Swatzell, Jr., University of Alabama, School of Medicine, Birmingham, Alabama

This routine is designed to give the user point or line plotting capability through the FOCAL Interpreter.

Minimum Hardware: PDP-8, ASR33, X-Y Plotter (Digital)
Other Programs Needed: FOCAL - 69, BIN Loader
Storage Requirement: 111_8 locations (in FOCAL)
Restrictions: This routine replaces the arctangent and log routines in FOCAL
Source Language: PAL III

DECUS NO. FOCAL8-91

Multiplication of Rectangular Matrices

Carl Bryant
Submitted by: Brother John F. O'Connell, St. John's Preparatory School, Danvers, Massachusetts

This is the author's answer to the suggestion made in DECUS NO. FOCAL8-33 that someone generalize the program to include multiplication of rectangular matrices.

Source Language: FOCAL - 69

DECUS NO. FOCAL8-92

FOCAL Horserace for the PDP-8 (8K) Computer

Gilbert S. Fair, Digital Equipment Corporation, Northbrook, Illinois

This program simulates a horserace with 9 horses, using a random number generator to produce different results for each race run, and permitting 20 or so bets to be placed on each race.

DECUS NO. FOCAL8-92 (Continued)

Minimum Hardware: 8K PDP-8, ASR33
Storage Requirement: 7000-8000 words (including FOCAL)
Source Language: FOCAL - 69

DECUS NO. FOCAL8-93

Dose-Response Routine

Rudolph H. deJong and Roger A. Nace, University of Washington School of Medicine, Seattle, Washington

The S-shaped log dose-response curve, widely encountered in biomedical analysis, is transformed to a straight line by probit conversion. This program outputs log dose and probit values for subsequent plotting on linear graph paper. The expanded program for 8K systems adds a plotting routine that outputs a scattergram on automatically scaled coordinates.

Minimum Hardware: 4K or 8K PDP-8
Restrictions: 4K FOCAL has no plot
Source Language: FOCAL - 69

DECUS NO. FOCAL8-94

Multidimensional Integration by Gaussian Quadrature

H. Bradford Thompson, University of Toledo, Department of Chemistry, Toledo, Ohio

A subprogram provides multidimensional integration of a known function by Gaussian quadrature. The user may define the function, integration limits, and number of points used. Gaussian quadrature is valuable within FOCAL because of its low error for a limited number of calculated points.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL - 69

DECUS NO. FOCAL8-95

One-Armed Bandit

James J. Ward and Larry A. Owens, Digital Equipment Corporation, Maynard, Massachusetts

This is a demonstration of the PDP-8 as a slot machine.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL - 69

DECUS NO. FOCAL8-96

Statistics - Standard Deviation

E. W. Coleman, Picker X-Ray Manufacturing
Submitted by: E. F. Steinfeld, Digital Equipment Corporation, Pittsburgh, Pennsylvania

Accepts any number of data values from the keyboard or from paper tape, computes and prints out mean, variance, standard deviation, coefficient of variation, maximum data value, minimum data value, and number of data points.

Minimum Hardware: PDP-8, ASR33 (high speed reader optional)
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-97

Multiple Equation Graphing on a Teletype

R. Bradford Malt, Wellesley High School, Wellesley, Massachusetts

This program graphs up to 9 equations simultaneously on an ASR33 or similar teletype. It requires only one type head pass per line, providing considerable speed. Provisions are made for error condition checks, and correction of specification overflow is automatic.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-98

FOCAL PUNCH OVERLAY

James J. Chang, Department of Chemistry, University of California at Berkeley, Berkeley, California

FOCAL PUNCH OVERLAY permits the FOCAL user to use the FOCAL "Write" command to punch out indirect programs on the high speed punch. The overlay self-destructs after use and must be reloaded to be used again.

Minimum Hardware: PDP-8, ASR33, high speed punch
Other Programs Needed: FOCAL-69
Source Language: PAL III

DECUS NO. FOCAL8-99

3 Dimensional TIC TAC TOE (3X3X3)

Leonard Fertuck, Saskatoon Research Council, Saskatoon, Saskatchewan, Canada

This program plays a game of 3 dimensional Tic Tac Toe in which the object is to maximize the total number of lines when all cells in the 3X3X3 cube have been filled. Game rules and operating instructions are provided as comments in this program.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-100

Additions to FOCAL W

Alan S. Fields, Naval Ship Research and Development Laboratory, Annapolis, Maryland

These are additions to FOCAL W, of 8/68, for both 4 and 8K systems. Assembly language listings are included as Appendices.

DECUS NO. FOCAL8-100 (Continued)

Appendix 1 gives the simple patch required to permit group numbers to go up to 31.99 rather than 15.99. This may be useful only with 8K. Included in Appendix 1 is the symbol table used by PAL-3 for all the additions.

Appendix 2 gives a simple routine which on repeated calls turns the echo on and off. This simplifies "read-in" of data tapes if only a low speed reader is available. The routine uses the DXS function slots in the tables. Systems with scopes will have to provide a change. The routine occupies unused locations in the floating point package.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-101

"HORSERACE"

William Garcia, Jr., Dow Badische, Freeport, Texas

Simple, but a very exciting horserace, based on the frequency of numbers generated. Ten decimal numbers, 0-9, are used for a better distribution. The highest frequency at which a number appears is paired with that of the lowest frequency.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 1968

DECUS NO. FOCAL8-102

Solution of Quadratic Equations with Complex Coefficients

Forrest Howard
Submitted by: Brother John F. O'Connell, C.F.X., St. John's Preparatory School, Danvers, Massachusetts

The principle basis of this program is from the discussion of quadratic equation with complex coefficients in INTERMEDIATE MATHEMATICS, PART II (SMSG, Yale University Press, 1961), Section 12-5, pp. 707-710. To get around the difficulty of working with the definition of

$$i = \sqrt{-1}$$

since the computer will reject the square root of a negative number, the rectangular form of $z = a + bi$ is converted to the polar form for the operations upon z and then back to the rectangular form for the output. The theorem included in the reference mentioned above indicates that some problems will have two solutions, while others will have only one. The example problems included with this program indicate that this is quite so.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL-69

DECUS NO. FOCAL8-103

TEACH

Edward Steinfeld, Digital Equipment Corporation, Pittsburgh, Pennsylvania

This is an example of what could be accomplished in the computer aided instruction realm. TEACH is only a sample and does not carry the student beyond the first hour of instruction. The program is divided into three sections: First, the instruction segment; Second, six problems with answers but no explanation; the third section is comprised of an explanation and six problems, with the option to continue or stop.

Minimum Hardware: 4K PDP-8
Restrictions: No functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-104

The Towers of Hanoi

Dr. Roger H. Abbott, Department of Zoology, Parks Road, Oxford, England

This program uses a recursive routine to solve the Towers of Hanoi problem. Either the total number of moves and the time required, or the actual moves, will be typed on the teletype. It is intended as a demonstration of the way in which recursion may be used in FOCAL.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-105A

LAB-8 Extended Functions for FOCAL (4K)

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

These replace the standard extended functions, to give the LAB-8 user greater flexibility in interacting with the AXØ8 through FOCAL, thereby simplifying the programming of certain applications which otherwise would only be possible in assembly language.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69
Source Language: PAL 1Ø Version 141

DECUS NO. FOCAL8-105B

LAB-8 Extended Functions for FOCAL (8K)

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This adds many more functions of general usefulness to those already implemented in the 4K version. The write-ups for both versions are combined in one document, but the tapes may be ordered separately.

DECUS NO. FOCAL8-105B (Continued)

Minimum Hardware: 8K PDP-8
Other Programs Needed: FOCAL-69
Source Language: PAL III Version 141

DECUS NO. FOCAL8-106

FOCAL Traveling-Wave Sketches

Arthur L. Pike, Tufts University, Department of Electrical Engineering, Medford, Massachusetts

This program sketches graphs of the following wave expressions:

$$i(y,t) = A\varepsilon^{\alpha y} \sin(10\pi t - \beta y) = \mathrm{Im}(A\varepsilon^{(\alpha + i\beta)y}\varepsilon^{i10\pi t})$$

In this equation, angular frequency $\omega = 10\pi$ radians per second, and propagation constant $\underline{r} = \alpha + j\beta$; the components of $\underline{r}$ are positive for an incident wave, with negative values for a reflected wave. Phase constant β is fixed by the program at $\pi/2$, thereby fixing the phase wavelength at:

$$L = \frac{2\pi}{\beta} = 4 \text{ units}$$

Thus, a value of $t = 0.1$ corresponds to π radians in the phase angle. Hence, with $t = 0.05$, the corresponding angle is 90°. Amplitude A is scaled by the program so that the maximum amplitude of any wave will tie in the sketch space.

Source Language: FOCAL-69

DECUS NO. FOCAL8-107

NIM

Kenneth McCord, Highland Park High School, Highland Park, Illinois

The game of NIM consists of three columns of coins where the number of coins in each column is different. The object of the game is, by alternating turns with the computer, to remove all the coins from the playing board. The one who removes the last coin or coins is declared the winner.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL with extended functions deleted. Also delete "=" sign
Source Language: FOCAL-69

DECUS NO. FOCAL8-108

Analysis of Variance for Two-Dimensional Material

Lars Palmer, AB Hässle, Pharmacological Laboratory, Goteborg, Sweden

This program calculates the standard analysis of variance table for a two-dimensional analysis of variance with the same number of replications per group.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-109a

Program to Find Real Roots of a Polynomial Equation of Degree N (an integer) With Real Coefficients

Jeff Gelpey
Revised by: Brother John O'Connell, C,F.X., St. John's Prep School, Danvers, Massachusetts

This program uses the NEWTON-RAPHSON method to find the real roots of a polynomial equation of degree N with real coefficients. It has the usual limitations of the above method, but has worked well for a large number of problems found in Calculus and Elementary Functions textbooks.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL '69

DECUS NO. FOCAL8-110a

SWAP - FOCAL Disk Data Overlay

James J. Chang, University of California at Berkeley, Chemistry Department, Berkeley, California

This overlay causes the 8K FOCAL interpreter to use the last two tracks of a DF32 disk for the storage of variables. The number of variables which may be used in an 8K system is changed from over 100 to well over 600 variables. Program execution time is, however, severely increased.

Minimum Hardware: 8K PDP-8/I, DF32 disk
Other Programs Needed: FOCAL, 1969 (DEC-08-AJAE-PB) and utility overlays (DEC-08-AJ1E-PB)
Restrictions: Only works with this version of FOCAL and overlay
Source Language: PAL, MACRO

DECUS NO. FOCAL8-111

Battle of Numbers Game (Newberry College Version)

Edward D. Huthnance, Newberry College, Newberry, South Carolina

The program allows the user to play Battle of Numbers against the computer. The computer usually wins.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-112

TIC-TAC-TOE (FOCAL)

Doug Wilson and Mark Linehan
Submitted by: Mr. C. Hamblet, Governor Dummer Academy, Byfield, Massachusetts

Two versions of this program are supplied. The first may be used with or without extended functions in core. It provides only the basic game logic, with minimal teletype messages. The second must be used without the extended functions in core. It has the following features: 1) Each move is shown in the form of a matrix; 2) Operator cheating is detected; 3) A running score is maintained.

Minimum Hardware: 4K PDP-8, ASR33
Miscellaneous: In both versions, the computer always makes the first move
Source Language: FOCAL-69

DECUS NO. FOCAL8-113

Acid--Base Titration Curves

Edgar H. Nagel, Valparaiso University, Valparaiso, Indiana

This program is designed to construct a titration curve for the titration of a weak acid (0.1M initial concentration) with 0.1M strong base. The acid may have any number of replaceable hydrogens and the successive pKa values are entered to initiate the plot. The only simplifying approximation is to substitute concentrations for activities.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL-69, with extended functions

DECUS NO. FOCAL8-114

Liquid Scintillation Data Processing Program

Arnold Fish, Digital Equipment Corporation, Princeton, New Jersey

Routine for calculating DPM, largest DPM value and plotting DPM data given data as a list of values in the format:

SAMPLE No.	TIME	COUNTS A	COUNTS B	COUNTS SUM
SN	T	CA	CB	CS

Source Language: FOCAL-69

DECUS NO. FOCAL8-115

Short Programs for Statistical Analysis Using FOCAL

D. J. Dowsett and R. Priest, Atkinson Morley's Hospital, Wimbledon, England

The package includes: 1) Plotting the Normal Curve for instruction purposes; 2) Calculation of the mean and standard deviation values for a single sample; 3) Student's 't' Analysis; 4) 2 x 2 Chi-squared analysis together with an open ended chi-squared program for testing goodness of fit; 5) Least squares correlation program together with a Spearman-rho correlation by rank; 6) Analysis if Variance for two samples with one criterion of classification.

Although designed for medical purposes there is no reason why these routines cannot be used in other faculties.

Source Language: FOCAL-69

DECUS NO. FOCAL8-116

KV8FT

Arthur L. Pike, Tufts University, Medford, Massachusetts

This patch incorporates a slightly shortened version of the Variable Stroke Character Generator in such a way that FOCAL can branch to VSCG for writing on the 611 scope instead of to XOUTL for writing on the teletype. With this patch, FOCAL can use the scope and high speed punch for writing FOCAL programs and for producing rapid punched output of tables or other lengthy data. With appropriate attention to format this patch allows FOCAL programs to add text labels to graphical constructions that are drawn with the aid of the GRAPH overlay.

Minimum Hardware: 8K PDP-8, KV8/I Display unit
Other Programs Needed: 8K FOCAL patch, FOCAL, GRAPH patch
Source Language: FOCAL-69

DECUS NO. FOCAL8-117

ED-50

Lars Palmer, AB Hässle, Pharmacological Laboratory, Goteborg, Sweden

This is an iterative procedure for a least square fit to the function :

$$Y = \frac{A}{1+\frac{B}{X}}$$; i.e. the dose-response curve.

Minimum Hardware: 4K PDP-8
Restrictions: Maximum data points c: a 30
Source Language: FOCAL-69

DECUS NO. FOCAL8-118

Three Mathematical Routines
1. To Raise A+B*I to the N Power
2. Complex Roots of Real Interpreters
3. Cube Root Finder

Forrest Howard
Submitted by: Brother John F. O'Connell, C.F.X., St. John's Preparatory School, Danvers, Massachusetts

1. To Raise a + bi to the Nth Power - This program is based on De Moivre's Theorem for raising complex numbers to a given power N. It works with all integral values of A and B and for A and/or B equal to zero. It seems reasonable to

DECUS NO. FOCAL8-118 (Continued)

assume that it would also work with decimal fractions for A or B. In the illustrative examples the = sign has been deleted to improve the printout of the answers which appear in rectangular coordinate form rather than the trigonometric form.

2. To Find the P Complex Routes of a Real Number N - This program was planned around the geometrical method of finding the cube roots of unity. The printout gives the roots in rectangular coordinate form of the complex number.

3. Cube Root Finder - This program gives a very good approximation of the cube root of real numbers.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL-69

DECUS NO. FOCAL8-119

CHEMS LAB 5

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Among the "new breed" chemistry courses designed for secondary application, the 'chemical materials study' (CHEMS) is a favorite which continues to be adopted, adapted, revised, and rewritten. CHEMS LAB 5 is designed to contrast the energy involved in a phase change with that of a chemical change using very simple materials and equipment. It also provides early experience in quantitative investigation by dealing with the uncertainly of measurement, and the ideas of accuracy and precision.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-120

PFI - Product Form of the Inverse

James H. Christensen, University of Oklahoma, Norman, Oklahoma

Matrix inversion using the product form useful for parametric studies and linear programming, as well as matrix inversion which is economical in terms of time and storage requirements.

Minimum Hardware: Any configuration with FOCAL
Source Language: FOCAL

DECUS NO. FOCAL8-121

Play Golf With Arnold Palmer

David A. Cutler, Lake Michigan College, Benton Harbor, Michigan

Simulates a golf game in which the user acts as caddy for Arnold Palmer and has control over what club he uses after his drive. It makes provisions for trees, water and sand traps. The program tallies the score for easy reference.

Minimum Hardware: 8K PDP-8/I
Other Programs Needed: LIBRA Overlay
Source Language: Multi-user FOCAL

DECUS NO. FOCAL8-122

Charge Account

Frederick W. Holzwarth, George Washington High School, Philadelphia, Pennsylvania

This program is useful in teaching high school students manipulation of subscripted arrays. It also gives academic students an introduction to business application. The data included was taken from one of the types of charge accounts offered by a local department store.

Minimum Hardware: 4K PDP-8/S, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-123

LOAD Command for FOCAL-1969

Edward Steinfeld, Digital Equipment Corporation

LOAD; new command for FOCAL-1969. If you have found that FOCAL is impossible to bomb-out, try this overlay. This command deletes the LOCATIONS command that is used to return control to the DISK Monitor. With LOAD you may change any core location in field Ø by simply typing LOAD LOCATION/CONTENTS using two four digit octal numbers.

Minimum Hardware: PDP-8
Other Programs Needed: FOCAL-69
Restrictions: Deletes use of LOCATIONS command
Source Language: PAL-D

DECUS NO. FOCAL8-124

Analysis of Variance Package

W. P. Ronald, Canada Department of Agriculture, Vancouver, British Columbia, Canada

This package contains two programs, a one-way analysis and a two-way analysis with block effects. In both cases, the initial output consists of single sample statistics. These are followed by an analysis of variance table and an F ratio. The analysis of variance tables produced by these programs may be used with an F test, such as Scheffe's or Duncan's to deter-

DECUS NO. FOCAL8-124 (Continued)

mine whether any significant differences exist between group means.

Restrictions: Requires deletion of extended functions
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-125a

Magtape Formatter for MTA Handler

John Alderman, Applied Data Research, Atlanta, Georgia

This creates the formatted magtape required for use with DECUS NO. 8-391, MTA Handler for PS-8. The program is started by a 'GO' and the tape length is entered by the operator. A formatted tape is then created, complete with zeroed directory, ready for use with the handler.

Minimum Hardware: 8K PS-8 System configuration, TC-58/TU-20 (7 track) IBM Compatible tape unit
Other Programs Needed: FOCL.S (DECUS NO. FOCAL8-148
Source Language: FOCL.S (DECUS NO. FOCAL8-148

DECUS NO. FOCAL8-126

PLOTTER

John W. Smith, Indiana University, Department of Anatomy and Physiology, Bloomington, Indiana

Allows one to utilize the teletype to plot a wide variety of equations (Y=F(X)). The equation is entered as a FOCAL 'SET' command. The program asks the limits of X and generates scaling information to place all data on the graph with maximum resolution. F(X) may include all the FOCAL functions.

Minimum Hardware: 4K PDP-8
Storage Requirement: 145 locations left (QUAD with extended functions)
Source Language: FOCAL-69

DECUS NO. FOCAL8-127

FOCAL-SLOT

F. R. Johnson, Dow Badische Company, Freeport, Texas

FOCAL-SLOT is a demonstration program which allows the operator to simulate playing a slot machine.

By repeated use of FRAN ( ) a three digit number is generated. Each digit is evaluated and the proper special character is printed. Operation is continuous until break out by a CTRL/C.

Minimum Hardware: 4K PDP-5/8
Source Language: FOCAL 1968

DECUS NO. FOCAL8-128

Probability (2P); From t ("Student") Distribution

Milton Landowne, M. D., U. S. Army Institute of Environmental Medicine, Natick, Massachusetts

Calculates probability that a difference between means is due to chance, when given the number of degrees of freedom and the ratio (t) of the difference between means and the standard error of this difference.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-129

FOCAL Readable Punch

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The operating program consisting of groups 1 and 2 will punch tape-high readable characters using the low speed punch. Groups 3, 4, 5 constitute the fundamental program which was used to build group 2, and which may be used to change or completely rebuild it.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69
Source Language: FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-130

FLHSTO

R. W. Carter, St. Peter's College, Jersey City, New Jersey

FLHSTO is a focal program which first provides a "tight" loop which gathers and counts data values while storing only unique entries. A frequency table and display follow second, and a histogram follows third and last. If storage permits, these sections may be used as subroutines.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-131

ZAREA

R. W. Carter and Friedrich A. Graeper, St. Peter's College, Jersey City, New Jersey

After input of two Z segment boundaries and a segment width (tolerance), ZAREA computes by numerical (summation) integration the area of the above segment under the Gaussian curve. Execution time can be decreased by tolerance increases at the expense of accuracy. Tolerance of Ø.ØØ1 or better produce highly accurate results.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-132

CIG-8 MARK II

J. J. Matthews, University of Exeter, Exeter, United Kingdom

CIG-8 is an overlay to FOCAL 1969 for interactive graphics on a non-storage scope. A reasonable refresh rate is obtained through a display file assembled by an integer storage function. Selective modification of the file by FOCAL programs gives interaction. The HSR routine is sacrificed but the rest of FOCAL plus a shortened FCOM, FIN and the F.F.T. function are added.

Minimum Hardware:	8K PDP-8 with VC8/I or equivalent; optional: Disk/Tape Monitor and AD08
Storage Requirement:	All of both fields
Source Language:	PAL-D

DECUS NO. FOCAL8-133

Withdrawn

DECUS NO. FOCAL8-134

1-20 Counting Game

John Ernst, Mary Holmes College, West Point, Mississippi

The program enables the user to play the 1 to 20 counting game with the computer. The game is played by counting from 1-20 using these rules: Players alternate, and each may say one or two numbers in succession, starting where the other player left off. The one who says 20 wins.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL-69

DECUS NO. FOCAL8-135

MODV - Choice

Arnold V. Fish, Digital Equipment Corporation, Parsippany, New Jersey

This overlay provides a modified version of 8K FOCAL-69 in terms of variable storage. It enables FOCAL to automatically store variables in field 1 along with the text which is normally stored there via 8K FOCAL. It gives the user more room in field for user created functions. It provides for software protection of the last page of field 1 if desired.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	FOCAL-69, 8K overlay
Source Language:	PAL-D and FOCAL-69

DECUS NO. FOCAL8-136a

FOCAL, AMITY 73 with FOP 1

Steven J. Roy, Amity Regional Senior High School, Woodbridge, Connecticut

This is an updated version of the original FOCAL, AMITY which was based on Rick Merrill's FOCAL '68 and adapted by Bob Tuttle of Amity RSHS. Several options are offered.

FOP 1, FOCAL Option Package, is an overlay compatible with and made for FOCAL, AMITY 73. It is used to retain or delete functions offered by FOCAL, AMITY 73's initial dialogue. It is particularly useful for installations with only low speed input capability.

Minimum Hardware:	4K PDP-8
Restrictions:	Cannot be used with Disk or Tape Monitor
Source Language:	PAL III

DECUS NO. FOCAL8-137

General Nth Order Regression

Richard W. Ralston, Jr., Olin Corporation, Charlestown, Tennessee

This program does a general Nth order multiple regression on data stored in an FNEW data array. Maximum is 9th order (without logs). Typeout gives coefficients, variances and "F" ratio on each variable, plus total variance and residual variance. The method is Forward Dolittle (see Hunter-Response Surface Methodology).

Minimum Hardware:	4K PDP-8 plus Disk
Other Programs Needed:	Any FNEW array FOCAL for storage of data
Source Language:	FOCAL

DECUS NO. FOCAL8-138

WCXT: The Wilcoxon Matched-Pairs Signed-Ranks Test for Non Parametric Data

G. C. Ongley, Graylingwell Hospital, Chichester, Sussex, England

A "T" test for non parametric data. It compares differences between two samples of paired data for magnitude and direction, large differences being given more weight than small differences.

Source Language:	FOCAL

DECUS NO. FOCAL8-139

Universal Input/Output for FOCAL

John Alderman, Applied Data Research, Atlanta, Georgia

A universal input/output handler for FOCAL has been developed. Of primary interest to those with "odd-ball" hardware configurations, it allows the FOCAL user to execute I/O commands, load external registers, and read them, and test for "skip" conditions, without requiring other assembly language

DECUS NO. FOCAL8-139 (Continued)

patches. The system has many potential uses, and as a teaching/debugging aid for hardware, relieves the unsophisticated user from much of the tedium in I/O testing. Since the PDP-8 and 9/15 have similar I/O command structures, a version for the 9/15 is undoubtedly possible.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL W (8/68)
Restrictions:	Works only with FOCAL W
Source Language:	PAL III

DECUS NO. FOCAL8-140

Withdrawn

DECUS NO. FOCAL8-141

Spanish Language FOCAL

Max M. Burnet, Digital Equipment Corporation, Maynard, Massachusetts

This patch is used to convert all the commands, functions and initial dialogue of FOCAL-69 to the Spanish language. It is provided as a binary tape which is loaded after the first two sections of FOCAL-69 (DEC-08-AJAE-PB).

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL-69 and INIT
Restrictions:	Applicable only to FOCAL-69
Source Language:	PAL III

DECUS NO. FOCAL8-142

Successive Powers of a Matrix

J. A. Peperstraete, Katholieke Universiteit Leuven, Heverlee, Belgium

This program calculates the successive powers of a matrix, up to the highest power the user wants. The program takes never more than three matrices in core, so there is no technical limitation to the highest power the user asks for - however one has to take into account the FOCAL precision of 6 digits and the cumulative effect of rounding-off errors. The order of the matrix is limited to 6 x 6; for matrices up to 9 x 9, the user has to change the output handling command 01.23.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL-69 without extended functions
Source Language:	FOCAL-69

DECUS NO. FOCAL8-143

Repeated Matrix Multiplication

J. A. Peperstraete, Katholieke Universiteit Leuven, Heverlee, Belgium

The repeated matrix multiplication program multiplies an unlimited number of matrices. The intermediary results are typed out only on user's request, so that a considerable amount of time is saved. The user types the input data of all subsequent matrices to be multiplied, at the end he asks the resulting product matrix which is typed out in matrix-like format.

The program detects itself if a new matrix conforms with the result of previous multiplications. The reduced storage volume is the program's major advantage; there are never more than three matrices in core, so, at each moment the total amount of available space (about 85 signed values) has to be divided among these three; e.g. when the previous result is a 3 x 3 matrix, the new matrix may be of order 12 x 3 etc.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL-69 without extended functions
Storage Requirement:	30 lines of FOCAL script
Source Language:	FOCAL-69

DECUS NO. FOCAL8-144

FOCALJ -- DECtape FOCAL-69

James Crapuchettes, Stanford Electronic Labs, Stanford University, Stanford, California

A modified version of FOCAL-69 (8K version) which includes DECtape I/O through the library command. This I/O is for non-file structured data. Also includes a FNEW command to access the data, a modified FADC command for the AF01-A A/D and a clock and an FPUP command to raise and lower the pen on an X-Y recorder connected in parallel to the display.

DECUS NO. FOCAL8-145

FOCAL for Disk and DECtape with Program Chaining

Lloyd B. Robinson, Lick Observatory, University of California, Santa Cruz, California

This version of FOCAL is useful for control of special devices. Special FOCAL commands can call FOCAL language subroutines from DECtape, store integers and variables on disk, and control block by block transfers between disk and DECtape. Up to 16 more special purpose commands can be added to the system in a convenient manner.

Minimum Hardware:	8K PDP-8, KE 8/I Arithmetic, One DECtape and/or DF32 Disk
Other Programs Needed:	Overlays 8K FOCAL-69
Storage Requirement:	0-3177, 4600-7577, 10000-10777, 16600-17777
Restrictions:	DECtape and disk storage ignores the Monitor
Source Language:	PAL

DECUS NO. FOCAL8-146

Zeller's Congruence/Day of the Week

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

A demonstration program in which Zeller's Congruence is applied to calculate the day of the week following input of month, day and year. Input is self-terminating.

Minimum Hardware:	PDP-8
Source Language:	FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-147

Interaction Analysis

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program is designed to accept the numerical input of verbal categories and then output all of the computed dimensions in the literature for interaction analysis by Flanders, Amidon, et al. The skilled user may then compare these dimensions for his own purposes.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	4K or more
Restrictions:	Limited to FOCAL 5/69
Source Language:	FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-148A (4K)

FOCL.S, An Expanded Language for Small Computers, Based on FOCAL

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia
Submitted by: John Alderman

This dialect of FOCAL-69 is intended to be a more powerful superset of FOCAL-69 and is syntactically compatible with it. Additional features include: multiple subscripted arrays; line continuation character; conditional "DO;" computed line numbers; expanded access to internal and external processor environment.

Minimum Hardware:	4K PDP-8 with ASR33
Source Language:	PAL-8

DECUS NO. FOCAL8-148B (8K)

See FOCAL8-148A above

Minimum Hardware:	8K PDP-8 with ASR33
Source Language:	PAL-8

DECUS NO. FOCAL8-149

Checkers

Paul M. Klinkman, North Smithfield Jr. Sr. High School, Woonsocket, Rhode Island

The computer plays a slightly modified version of checkers using this program. The checkers never land on 32 spaces. This saves 32 variables. Because of the strange nature of the board, checkers can't go off one side of the board to the other side.

Restrictions:	Unable to handle multiple jumps
Source Language:	FOCAL-69

DECUS NO. FOCAL8-150

FRAN8

Paul Fingerman, Department of Psychology, State University of New York, Stony Brook, New York

This overlay is a modified version of DECUS NO. FOCAL8-1 which was an adaptation of Brady's random number generator for FOCAL W. It does not replace it. This version was rewritten for FOCAL-69 without extended functions. It is relocatable, and can easily be adapted for use with extended functions.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	FOCAL-69
Storage Requirement:	66_8 locations, relocatable
Source Language:	PAL III

DECUS NO. FOCAL8-151

Fast Matrix Inversion for Real Numbers

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program will invert a matrix up to size 17 x 17 of real numbers using modified Gauss-Jordan methods. It is translated from DECUS NO. 8-72.

Minimum Hardware:	8K PDP-8, ASR33
Other Programs Needed:	FOCAL-11 or FOCAL-8 with 8K overlay
Restrictions:	If the error check is omitted, sizable errors will occur
Source Language:	FOCAL-11 (DECUS NO. 11-24)

DECUS NO. FOCAL8-152

Surface Plate Auto-Collimation

E. Welsh and R. Sinwell, Westinghouse Electric Corporation, Cheswick, Pennsylvania

This program is designed to calculate linear deviations of points along various tracks of a surface plate against a reference plane through 3 arbitrary points or linear deviations of points on a machine tool way against a reference line through 2 arbitrary points.

Input data consist of angular deviations in seconds measured by means of an auto-collimator in combination with a plane reflector. Output data consist of linear deviations in micro-inches.

Minimum Hardware:	4K PDP-8/I or 8/L
Restrictions:	Delete extended functions
Source Language:	FOCAL-69

DECUS NO. FOCAL8-153

Two Overlays for FOCAL '69, FEXP-X-P and FLOG

C. Ediss, University of Alberta, Edmonton, Alberta, Canada

This program relocates the FOCAL 69 exponential function into an area of core usually assigned to the high speed reader. Two new commands are also added to this area. The P command allows direct programming of full echo-non echo; the X command allows the removal and replacement of the = and sign in the output format. About 1100 locations are free to the FOCAL user. The log function may be added as an option, and uses 91 locations of FOCAL programming space. Sine, Cos and arctangent functions are not available.

Minimum Hardware: PDP-8, ASR33
Other Programs Needed: RIM, BIN, FOCAL-69 (DEC-08-AJAE-PB)
Source Language: Binary

DECUS NO. FOCAL8-154

8K FOCAL Display

Floor Anthoni, Medical Biological Laboratory, National Defence Research Council TNO, The Netherlands

In computer-graphics it is necessary to be able to display both lines and characters for a good picture. This program will provide these possibilities for the experienced FOCAL user. Two new functions (FX and FDIS) transform information from the FOCAL program to the display routine.

Minimum Hardware: 8K PDP-8, KV 8/I interface

DECUS NO. FOCAL8-155

FACTORS

Peter DeWolf, 1244 Oak Trail Drive, Libertyville, Illinois

This program will calculate the prime factorization of a number, x, and print it, print related prime factor information, give square root of x in a perfect square and give other related information.

Minimum Hardware: 4K PDP-8, ASR33
Restrictions: Extended functions removed; Tested numbers limited to 6 digits
Source Language: FOCAL-69

DECUS NO. FOCAL8-156

Blackjack for FOCAL

Vincent Perriello, Taft School, Watertown, Connecticut

This program was written to emphasize the versatility of the PDP-8 FOCAL while serving as an amusement to new or inexperienced users. It occupies nearly all of the buffer space, with the subscripted "card" variables.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-157

Modifications to TSS/8 FOCAL

Allan B. Wilson, Computer Applications Associates, Houston, Texas

TSS/8 FOCAL modified to provide two new capabilities: Use of arithmetic expressions as targets in branching statements, and disk storage of FOCAL programs. The patches occupy the core areas assigned to the high speed paper tape reader routines, the library command, and the binary loader in standard 4K FOCAL-69, hence, no text or pushdown space in TSS/8 FOCAL is sacrificed with the inclusion of these features.

Minimum Hardware: TSS/8
Source Language: FOCAL-69

DECUS NO. FOCAL8-158

Mileage Program

Carl Kishline, University of Wisconsin, Kenosha, Wisconsin

Computes the average gas mileage from the fuel consumption and distance, after which it will estimate the cost of fuel for a trip of a given length.

Minimum Hardware: 4K PDP-8, ASR33
Miscellaneous: This program will operate on a 7-user FOCAL system and should work on any FOCAL system including 4K with the extended functions

DECUS NO. FOCAL8-159A

Computer Programs in Use in the Water Qualities Division, Vol. 1

Dr. Adrian Demayo, Water Quality Division, Department of Fisheries and Forestry, Ottawa, Ontario, Canada

This is a booklet containing programs AD0001 through AD0008. The first four programs are for Least Square Fit to Various Types of Polynomial Expressions; three programs are for Least Square Fit to a Linear Expression with Two or Three Variables and the last program is for Solutions of a Polynomial Equation.

DECUS NO. FOCAL8-159B

Computer Programs in Use in the Water Qualities Division, Vol. 2

Dr. Adrian Demayo, Water Qualities Division, Department of Fisheries and Forestry, Ottawa, Ontario, Canada

This booklet contains programs AD0009 through AD0014. The first two are for Balance Calculation; one program is for Calculation of Concentration from Auto Analyzer Charts and the last three are Report on Analysis.

DECUS NO. FOCAL8-159C

Computer Programs in Use in the Water Quality Division, Vol. 3

A. Demayo and P. Goulden, Department of the Environment, Ottawa, Canada

These programs, AD0015 and AD0016, are used to calculate the standard curves and the analytical results obtained with a Technicon CSM-6 Auto Analyzer.

Miscellaneous:	These booklets may also be ordered free of charge directly from Dr. Demayo
Source Language:	FOCAL-69

DECUS NO. FOCAL8-160

Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test

Elliott Gale and Gene Sylwesuik, SUNYAB Department of Behavioral Science, Buffalo, New York

These are statistical programs which allow the user to test the difference between two independent groups (Mann-Whitney) or between two related groups (Wilcoxon) when the data do not meet the criteria for parametric t tests.

Minimum Hardware:	PDP-8/S
Source Language:	FOCAL 8/68

DECUS NO. FOCAL8-161

Wilmot Grading Program

William W. Wilmot, Central Michigan University, Mt. Pleasant, Michigan

The purpose of this program is to average students' grades. It can be used for any number of grades per student. It calculates the average grade for each student, the overall class average, and the class standard deviation.

Minimum Hardware:	4K PDP-8
Restrictions:	Letter grades must be converted to numbers
Source Language:	FOCAL-69

DECUS NO. FOCAL8-162

Transistor H-Parameter Conversions

James A. Williams and Robert E. Werner, Brigham Young University, Provo, Utah

This program will allow the user to convert from one H-parameter to another under control of FOCAL. When the user types "GO" the program will introduce itself and ask questions concerning the type of parameter data one has and the parameter he requires. After the new data is typed out the program will ask questions concerning circuit gain. The value obtained from this calculation is theoretical since all the program requests is a value for RL (load resistance). The program was written under TSS/8 control, but the ASCII tape available may be loaded in the teletype under control of FOCAL. A binary tape is available for users with a high speed reader and the PIP option.

Minimum Hardware:	4K PDP-8 with teletype, high speed reader optional
Restrictions:	Delete all extended functions in FOCAL
Source Language:	FOCAL-69

DECUS NO. FOCAL8-163

Erlang C Blocking Probability Programs

Richard R. Plum, Traffic Systems Engineering Department, Bell Telephone Labs, Inc., Holmdel, New Jersey

Three programs are offered: The first computes the Erlang C Blocking Probability; the second computes the Erlang C Blocking Probability and the average delay in seconds; the third computes the Probability of a delay greater than 10 seconds in addition to the above.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL-69

DECUS NO. FOCAL8-164

Four New Functions for FOCAL 5/69

Vincent E. Perriello, Taft School, Watertown, Connecticut

This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52) enables four new functions that make FOCAL more user-oriented than ever. With the aid of these additions the user can tailor FOCAL to his own needs. They give the ability to write or call subroutines in core, read the switch register and read from any core location, an aid in debugging. This patch wipes out FADC, FDIS, FDXS and FNEW.

Other Programs Needed:	FOCAL 5/69 (DECUS NO. FOCAL8-52)
Storage Requirement:	31_8 locations
Source Language:	PAL-D

DECUS NO. FOCAL8-165

F- (Variance Ratio) Distribution Probability

Alan S. Fields, U. S. Naval Ship Research and Development Laboratory, Annapolis, Maryland

For X_1^2 and X_2^2. independent random variables following chi-square distributions, with V_1 and V_2 degrees of freedom, the distribution of $F = \frac{X_1^2/V_1}{X_2^2/V_2}$ follows the variance ration distribution. The probability that F occurred by chance, a

DECUS NO. FOCAL8-165 (Continued)

measure of effectiveness of the experiment, is calculated.

Minimum Hardware: PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-166A & B

First and Second Order Partial Correlations

Dr. William Wilmot, Central Michigan University, Mt. Pleasant, Michigan

Program A computes the three first order partial correlations for three variables. User supplies the zero-order correlations between the three variables. In program B the user supplies the correlations between the four variables and the program calculates the second order partial correlations between the four variables.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-167

Five Statistical Programs for the PDP-8 or PDP-12

Stephen J. Mayor, Medical College of Ohio at Toledo, Toledo, Ohio

This package consists of five statistical programs. Since there is insufficient storage space for data if the programs are chained together and fed into a machine with only 4K of core, each tape may be ordered separately. However, if sufficient core is available, these programs may easily be chained together using FOCAL since none of the instructions in any of the programs occupy the same line number. The programs are: 1) Student's t Test; 2) Dunnett's t Test; 3) Normalized Plot Routine; 4) Mean and Standard Deviation; 5) Analysis of Variance for Single Variable of Classification.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-168

One-Armed Bandit - PDP-8 Style

Frank R. Borger, Michael Reese Hospital, Chicago, Illinois

One-Armed Bandit lets the player operate the computer as a slot machine. The computer "spins the wheels," checks for wins, and keeps a total of the player's wins or losses. This is similar to DECUS NO. FOCAL8-95 and FOCAL8-127. DECUS would be interested in user feed-back as to which program is superior.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-169

FOCAL Version of the GE Basic Artillery Game

Ronald A. Wong, Edmund Wong, 660-44th Avenue, San Francisco, California

In most computer games the situation is the player versus the computer. However, in this game, the computer is just measuring the skill of the player -- by testing his ability with an artillery piece in coming within 100 yards of a target, whose distance was randomly selected.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69 with extended functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-170

Saint Peter's College Statistical Package

Professor Robert W. Carter, Saint Peter's College, Jersey City, New Jersey

This package contains 8 programs for statistical analysis with FOCAL. The tape for each application may be ordered separately or the complete package may be ordered as one unit. All write-ups are included in one document. The programs and their applications are as follows:

FOCAL8-170.1 FLGPLT - Plots scaled frequency distributions
" .2 FLBIND - Computes binomial probability Distributions
" .3 FLPCTL - Computes percentile scores
" .4 FLSDEV - Computes means and related measures
" .5 FLHMES - Computes "H," the information measure of noise
" .6 FLTMES - Computes "T," the information measure of relationship
" .7 FLPEAR - Computes a Pearson linear correlation and regression analysis
" .8 FLSPER - Computes Spearman's rank-order correlation coefficient

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-171

Minnesota Sociology Statistics Programs

Philip M. Voxland, Department of Sociology, University of Minnesota, Minneapolis, Minnesota

The program package consists of a series of small statistical analysis programs of interest to behavioral science researchers. Various parametric and non-parametric statistics are calculated for nominal, ordinal, interval, and ratio level measurements, for discrete and continuous data and for raw data, grouped data and tabular data.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69
Source Language: FOCAL 69

DECUS NO. FOCAL8-172

XPON

David A. Moon, Wayland High School, Wayland, Massachusetts

The purpose of XPON is to calculate integer powers of positive integers with more than the usual seven digits of precision in FOCAL. As the result is computed, it is divided into groups of five digits. Each group occupies a FOCAL variable. The method of exponentiation is repeated multiplication.

Restrictions:	The base and the exponent must both be integers
Source Language:	FOCAL

DECUS NO. FOCAL8-173

APOLLO II

David A. Moon, Wayland High School, Wayland, Massachusetts

This is a greatly improved version of the Apollo simulation game which has been running on almost every timesharing system in the country. The user is pilot of a lunar module, which he can steer in two axes. It is free to move up and down, and parallel to the lunar surface. The user must control attitude thrusters and the descent engine by typing in numbers. The program reports time, range to landing site, attitude, velocity components, fuel reserves, etc. every 5 seconds of simulated time. A small random error is introduced into these figures to simulate real conditions. After the module reaches the lunar surface, the program reports on its condition and makes remarks about the pilot's skill. This version of Apollo has been found to be considerably more challenging than the version which permits only vertical motion, since there are far more variables to control.

Minimum Hardware:	PDP-8 with Disk (must be able to run LIBRA)
Other Programs Needed:	FOCAL-69 (DEC-08-AJAE), LIBRA (DEC-08-AJ5E or DEC-08-AJ6E)
Storage Requirement:	Two library blocks (1400 words)
Source Language:	FOCAL-69, LIBRA

DECUS NO. FOCAL8-174

SYNDIV 5

David A. Moon, Wayland High School, Wayland, Massachusetts

SYNDIV 5 permits synthetic division of m-polynomial by n-polynomial. The user is requested to type in the coefficients of two polynomials. The first is divided by the second, and the coefficients of the quotient and remainder are printed. On input or output the "*X↑n" associated with the coefficient is supplied by the program. The degrees of both the dividend and the divisor may be from 1 to 9 with the extended functions still in core. A translation into a dialect of APL is included.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL

DECUS NO. FOCAL8-175

Modifications and Supplement to FOCAL8-50
RC Active Filter Design and Plot and 3-Pole Butterworth Filters

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

As in FOCAL8-50, the filter design and plot portion of this program are separate parts - a computation program and a graphing program. The computation program allows: a) speedier execution, b) format, c) self reinitialization, which allows several passes at a design. The modifications to the graph program consist of: a) removal of a bug, b) format, c) simplification of coding. These two parts cannot both fit into FOCAL's user area and hence must be used one at a time. The 3-Pole Butterworth Filters portion of the program scales the normalized designs by Kerwin in Huelsman's Active Filters (McGraw-Hill, 1970) to meet the parameters of the user.

Minimum Hardware:	4K PDP-8 and TTY
Other Programs Needed:	FOCAL, 1969 with extended functions
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-176

Program for Producing Histograms from Clinical Data on Teletype

Eddy Emons, Royal Postgraduate Medical School, Hammersmith Hospital, London, England

This program uses data from the Hypertension Clinic, which are blood pressure measurements taken from patients in the lying and upright positions respectively. Both the systolic (upper) and the diastolic (lower) pressures are recorded for each position.

FOCAL is used with all the extended functions erased. The data are recorded with the high speed reader and stored in a two dimensional array in field one via the integer overlay FNEW. For each pressure measurement, the mean and standard deviation are computed.

From the two dimensional array stored in field one another two dimensional array is computed and stored in field zero, representing the histogram data. FOCAL then scans through each array and types the histogram on the teletype.

Minimum Hardware:	8K PDP-8/I, high speed reader
Other Programs Needed:	FNEW integer overlay
Storage Requirement:	Program: 515 locations; data field one: 3900; field 0: 566 locations
Restrictions:	Extended functions are deleted
Source Language:	FOCAL-69

DECUS NO. FOCAL8-177

PS/8 FOCAL, 1971

David Schneider and Barry Smith
Submitted by: Hartwell H. Whitney, Jr., Oregon Museum of Science and Industry, Portland, Oregon

PS/8 FOCAL, 1971 is a modified version of FOCAL, 1969 for use with PS/8. It provides device-independent library commands, data file manipulations, recursive subroutine calls and chaining to other programs, character manipulations, computed line numbers, and other features.

A LINCtape version is available for PDP-12 users.

Minimum Hardware:	PS/8, 8K and mass storage device, 64K disk or DECtape
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. FOCAL8-178

Motion Picture Package

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This is a package of six short FOCAL routines which should prove useful to those in the motion picture industry. It consists of: 1) 16 mm Motion Picture Theater Optimization, 2) Motion Picture Scaling Program for Special Effects, 3) Running Time Program for Professional Motion Picture Films, 4) Movie Theater Lens Selection Program, 5) Cine Lens Depth of Field and Hyperfocal Calculations, 6) Footage-to-Time Conversion Program for 16 mm, 35 mm and 65/70 mm Cine Films.

Minimum Hardware:	4K PDP-8 with TTY, or any configuration equipped for FOCAL
Storage Requirement:	4K
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-179

Depth of Field Program for Still Camera Lenses

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

In order to insure sharp focus in their photographs, amateur and professional photographers need to determine the depth of field of their lenses for particular settings. This program is based upon the assumption that an acceptable circle of confusion has a constant relation to the lens EFL.

Minimum Hardware:	4K PDP-8 with TTY
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-180

FOCAL-SORT

F. R. Johnson, Dow Badische Company, Freeport, Texas

This is a short routine to sort subscripted arrays by pair interchange. If duplication is found in array(x), then corresponding two elements in array (y) are sorted into ascending order.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL-1968
Restrictions:	Inefficient for arrays of greater than 20 elements
Source Language:	FOCAL-1968

DECUS NO. FOCAL8-181

Filter Design

Ronald Zane, Institute for Astronomy, University of Hawaii, Honolulu, Hawaii

Filter Design is a program for the design of five passive filters:

1. Constant K High Pass Filter
2. Constant K Low Pass Filter
3. Bridged T Notch Filter
4. Parallel T Notch Filter
5. Lumped Parameter Constant K Delay Line

On line interaction with the program facilitates a compromise between operational parameters and available components.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-182

First Order Differential Equation: Initial Value Problem

Algorithm by Runge-Kutta
Submitted by: U. K. Shivadev, Harvard University, Cambridge, Massachusetts

This program, which offers the 4th order Runge-Kutta method of solving a first order non-linear differential equation, is self-explanatory. Initial value, step size and termination point are to be specified. Results are typed at specified intervals.

Minimum Hardware:	8K PDP-8/E, ASR33
Source Language:	8K FOCAL '69

DECUS NO. FOCAL8-183

DARTS

D. W. Robert, COMPRITE, LTD., Boreham Mill, Warminster, Wilts., England

This game allows a number of players to play 301 DARTS according to English rules. The darts never fall out of the board.

DECUS NO. FOCAL8-183 (Continued)

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-184

Manpower

C. C. Wilton-Davies, Royal Naval Physiological Laboratory, Alverstoke, Gosport, Hants, England

This is an interactive program for allocating manpower between a number of jobs with different deadlines. The costs of different solutions may be compared, and options of overtime, hiring and firing are available.

Minimum Hardware: 8K PDP-8
Other Programs Needed: 8K FOCAL
Source Language: 8K FOCAL '69

DECUS NO. FOCAL8-185

LIFE

C. C. Wilton-Davies, RNPL, Alverstoke, Gosport, Hants, England

This program is a FOCAL version of the game LIFE, attributed to John Horton Conway of the Cavendish Laboratory in Cambridge, England. The computer plays with a matrix of locations, each of which may start as full or empty. Full locations are said to contain "cells" which survive, die or reproduce according to simple laws.

Minimum Hardware: 4K PDP-8 for very limited 4 x 4 matrix, 8K for reasonable size matrix
Source Language: FOCAL

DECUS NO. FOCAL8-186

SUMER (French)

J. F. Champarnaud and F. H. Bostem, Liege, Belgium

This French language version of HAMURABI (the Sumer Game) is available on both paper tape and PDP-12 LINCtape. On the LINCtape, both FOCAL, 8K and FOCAL SUMER lists are included.

Minimum Hardware: 8K PDP-8 or PDP-12
Source Language: 8K FOCAL '69

DECUS NO. FOCAL8-187

Display FOCAL

E. Seliak and W. Martin, University of Melbourne, Parkville, Australia

This program enables FOCAL to plot on the storage tube, in vector mode, under interrupt.

Minimum Hardware: 4K PDP-8, VTØ1 storage tube with KV8/I controller, TTY
Other Programs Needed: FOCAL, 1969
Storage Requirement: 0-7577
Source Language: PAL

DECUS NO. FOCAL8-188

Generating Random Numbers with FOCAL

W. Siegel, K. Whittle and J. Siegel, University of Western Ontario, London, Canada

This program provides a patch to correct the problem with FOCAL's random number generator. This routine uses an algorithm developed by Green, Smith and Klem (1959) which has several advantages for use with minicomputers. First, unlike most such generators, it uses an addative rather than a multiplicative process; addition is much faster than multiplication with most machines. Second, the routine is relatively short and third, it has been documented and tested and its characteristics are known. A listing for the patch for FOCAL-12 is provided, but other versions of FOCAL may be modified with similar changes. Three short general programs are included which type out sequences of random integers.

Minimum Hardware: PDP-8 or PDP-12
Other Programs Needed: FOCAL, FOCAL-12
Source Language: Assembly Language

DECUS NO. FOCAL8-189

8K Overlay Patch for FOCAL5/69 (DECUS NO. FOCAL8-52a)

Magnus Lundin
Submitted by: Lars Palmer, AB Hassle, Goteborg, Sweden

This patch corrects some bugs in FOCAL 5/69. The changes include: 1. No line feed generated when printing a CR in character mode. 2. CTRL/C given during high speed punching no longer causes FOCAL 52a to hang in the interrupt routine. 3. CTRL/L is ignored during data input. 4. 8K patch corresponding to 8K patch for FOCAL '69. 5. Hello command corresponding to: OT, I, E, : S; E; EA;. 6. A visual indicator in line Ø if extended functions are in core. 7. Space is created in the library lists for additional library commands. 8. ADC and display routines are removed.

Minimum Hardware: 8K PDP-8/E, HSP (Can easily be rewritten for other PDP-8 computers
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: PAL

DECUS NO. FOCAL8-190

Patch to Add LABEL Feature to FOCAL 5/69 (DECUS NO. FOCAL8-52a)

Magnus Lundin
Submitted by: Lars Palmer, AB Hassle, Goteborg, Sweden

This patch adds LABEL (DECUS NO. 8-68a) in a slightly modified version to FOCAL 5/69 in such a way that it can be reached from keyboard by a new library command. The program is stored in field 1, beginning at 71ØØ and can be removed by another library command if all of field 1 is required for large programs.

Other Programs Needed: DECUS NOs. FOCAL8-52a and FOCAL8-189
Source Language: PAL

DECUS NO. FOCAL8-191

Reverse Overlay for FOCAL, 1969

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This overlay can be used to convert 4-word (10 decimal place) FOCAL back to normal 3-word (6 place) FOCAL.

DECUS NO. FOCAL8-192

Echo Change for FOCAL, 1969

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This is a patch for one-user FOCAL, 4K or 8K, to allow killing (and restoration) of echo by typing an asterisk (*) followed by a carriage return. The High Speed Reader routine in FOCAL is sacrificed when this patch is used. No user or function storage is taken.

DECUS NO. FOCAL8-193

Anova, 2-way, Unsymmetrical

Lars Palmer, AB Hassle, Goteborg, Sweden

This is an analysis of variance program for the two-way classification table. It is a general method to analyze two-way classifications which gives the analysis of variance table and calculated row and column factors for unequal groups and for missing groups.

Minimum Hardware: 8K PDP-8, HSR helpful
Source Language: FOCAL '69

DECUS NO. FOCAL8-194

Rectangular to Polar Coordination (German)

Frank Dieter Lehmann, Hauni-Werke, Hamburg, Germany

In the original Rectangular to Polar Conversion program (DECUS NO. FOCAL8-39) the polar to rectangular program works very well, but the rectangular to polar conversion works only if $-90^{\circ} < \text{angle} < +90^{\circ}$ which restructs it, this program works for $0^{\circ} \leq \text{angle} < 360^{\circ}$. The short listing is commented in German.

Minimum Hardware: 4K PDP-8, TTY
Source Language: FOCAL '69

DECUS NO. FOCAL8-195

All Purpose Graphing Program

Mike Viola
Submitted by: Robert T. Cronin, Belmont Hill School, Belmont, Massachusetts

This program can plot almost any type of equation through the three options afforded the user in the program. All graphs are inverted and scaled down so that the entire graph fits on the dimensions given the program. This makes selective enlarging of any graph possible.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL-QUAD
Storage Requirement: At least 800 FOCAL locations
Source Language: FOCAL '69

DECUS NO. FOCAL8-196

Fisher's Exact Test

Robert M. Smith, University of Alabama Medical Center, Birmingham, Alabama

This non-parametric technique is used with 2 X 2 bivariate tables when cell frequencies are insufficient for Chi-square tests. The program prints a table with labels and marginal frequencies and an exact probability of occurrence of the frequency distribution.

Minimum Hardware: 4K PDP-8/I, ASR/KSR33
Source Language: FOCAL

DECUS NO. FOCAL8-197

Self-Teaching Program for FOCAL

Henry R. Bungay, III
Submitted by: T. L. Drake, Clemson University, Clemson, South Carolina

This program teaches elementary features of FOCAL. The concept is to leave the program to try to use the commands. A guide sheet lists statement numbers for convenient reentry into the teaching program. Although the program is used routinely on a PDP-15 it has been tested by the author on a PDP-8. For use with a PDP-8, with a small memory, earlier portions of the program must be erased to provide room for subsequent portions. It would be very easy to modify the program or to use parts of it in other programs.

Minimum Hardware: 4K PDP-8 or PDP-15
Source Language: FOCAL

DECUS NO. FOCAL8-198

Michaelis-Menten Kinetics

Stan Vivian, University of Manitoba, Faculty of Medicine, Winnipeg, Canada

This is a FOCAL program to provide maximum likelihood estimates of the parameters VMAX and K of the Michaelis-Menten equation. Standard errors and both 95 and 99% confidence limits of the parameters are also provided. Fitted data points and the reciprocals of the estimates are printed out for graphical purposes.

Minimum Hardware:	8K PDP-8, TTY
Storage Requirement:	FOCAL Text: Locations 100-4705 Field 1
Restrictions:	Maximum of 30 data points
Source Language:	FOCAL '69

DECUS NO. FOCAL8-199

Stock Market Game

Ronald Papa, Hamden High School, Hamden, Connecticut

This game simulates buying and selling of stocks based on the exchange's most basic principles. The operator has a choice of three different stocks to deal with. Each is preset and rises and falls randomly within a range of ± 3.5. Starting with $10,000 the player continues until all his money and stocks are lost or until he chooses to stop with whatever 'profit' or 'loss' he has taken.

Restrictions:	No extended functions on PDP-8 series
Source Language:	FOCAL '69

DECUS NO. FOCAL8-200

SIMEQR - 20 Simultaneous Equations in 8K FOCAL

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program provides solutions of as many as 20 linear simultaneous algebraic equations with real-number coefficients. The program also tabulates the input data with row-column labels for efficient verification.

Minimum Hardware:	8K PDP-8/I, ASR33 (Should have high speed reader for paper tape data entry
Other Programs Needed:	8K FOCAL '69 and DECUS NO. FOCAL8-201
Source Language:	FOCAL8

DECUS NO. FOCAL8-201

FOCAL Patch for Function FP, Mod 4B

Arthur L. Pike, Tufts University, Medford, Massachusetts

This patch provides facility in 8K FOCAL for 3-word floating point data storage in Field 1, permitting 596_{10} items to be filed or retrieved under function FP. This put and get operation is an adaptation of DECUS NO. FOCAL8-7 for use with 8K FOCAL, 1969.

Minimum Hardware:	8K PDP-8, ASR33
Other Programs Needed:	FOCAL '69 with 8K overlay DEC-08-AJ1E
Restrictions:	FOCAL statements must be below 4000, Field 1 (See write-up)
Source Language:	PAL III

DECUS NO. FOCAL8-202

Code Generator

Peter DeWolf, 1244 Oak Trail Drive, Libertyville, Illinois

This program will type out a complete Vigenere cipher table, with random first line, for polyalphabetical substitution. It will also type out the corresponding decoding table for ease in use: Both tables, or either one alone, can be typed as many times as desired.

Minimum Hardware:	PDP-8/S, ASR33
Other Programs Needed:	DECUS NO. FOCAL8-52a
Restrictions:	Extended functions out
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-203

Graph Sketching

Peter Cornish, Trinity Grammar School, Melbourne, Australia

This program should prove useful in the study of probability, statistics, areas under curve, etc. After the program is started, the computer asks a number of questions needed to sketch the graph. After the necessary input it then sketches the graph and types the X and Y values for the points plotted.

Minimum Hardware:	PDP-8/L or equivalent
Restrictions:	Can only plot one Y value for any X value
Miscellaneous:	Can be used with FOCAL's extended functions IN
Source Language:	FOCAL '69

DECUS NO. FOCAL8-204

Acid-Base Equilibria

F. R. Johnson, Dow Badische Company, Freeport, Texas

Acid-Base Equilibria will calculate hydrogen ion concentration, hydroxyl ion concentration, pH, and paH based on a variety of inputs.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL 1968
Source Language:	FOCAL, 1968 extended

DECUS NO. FOCAL8-205

Random Walk/Array

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program generates and plots a random two dimensional array.

Minimum Hardware:	4K PDP-8, ASR
Other Programs Needed:	DECUS NO. FOCAL8-52a
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-206

FOCAL Generates Binary Patches

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The educational uses of a minimum 4K system dedicated to FOCAL needs a convenient way to punch binary format tape, especially if this is usually in the form of short patches from well documented machine language listings. This program makes use of the convenient special options of FOCAL 5/69 (DECUS NO. FOCAL8-52a) to format and punch leader, trailer, origin and instruction codes, as well as a checksum using the ASR punch.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-207

EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The single character handling of FOCAL 5/69 is used to output EIA on the low speed punch of an ASCII teletype. A second program formats and lists the NC program for a two-axis 'SLO-SYN' machine controller. It stores the required characters and outputs a finished tape.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions:	Works with 5/69 version of FOCAL only
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-208

A Normally Distributed Random Number Generator in FOCAL

Stan Vivian, University of Manitoba, Winnipeg, Canada

This two line program will provide a normally distributed random number from a population of mean zero and specified standard deviation S. Besides the input standard deviation S, the subroutine uses two variables X and Y. The normally distributed number is returned as X. Another version is provided for use with DECUS NO. FOCAL8-150; it is a single line of FOCAL and executes faster. A demonstration program is also included.

Source Language:	FOCAL '69

DECUS NO. FOCAL8-209

GRFIT, A Simple Least Squares Routine

R. C. Gross, Eastman Kodak Company, Rochester, New York

The program accepts data for x and y, where x is known and y has some degree of scatter in the data, calculates the best straight line, gives a correlation coefficient as well as standard errors for the calculated slope and intercept.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL 1969 or similar
Restrictions:	Best used without extended functions
Miscellaneous:	See also DECUS NO. 8-483
Source Language:	FOCAL

DECUS NO. FOCAL8-210

CHAIN and FCOM

Alessandro Zanon, Instituto Nazionale diFisica Nuclear, Legnaro (padova) Italy

CHAIN - A virtual no-core memory FOCAL overlay chaining FOCAL programs.

FCOM - A new function to store data on common area or on DECtape.

These two complementary programs are written for the use of FOCAL on 4K PDP-8 family computers with the DECtape Monitor System. They are used whenever a series of programs and/or a large amount of data are necessary.

Minimum Hardware:	4K PDP-8, TC01 and two TU55 DECtapes
Other Programs Needed:	FOCAL (DEC-08-AJAE-PB) and DECtape Monitor System
Storage Requirement:	4200-4777
Restrictions:	No Extended Functions, FADC( ) and FRAN ( )
Source Language:	PAL-D

DECUS NO. FOCAL8-211

WEST-KY Four-User FOCAL

C. Davis, L. McGimsey and G. Moore, Western Kentucky University, Bowling Green, Kentucky

This modified version of four-user FOCAL '69 provides a DECtape library facility accessible to all users. A library of approximately 100 FOCAL programs including some FOCAL tutorials, drills, and a variety of programs which are intended for the support of undergraduate science and mathematics

DECUS NO. FOCAL8-211 (Continued)

instruction is included. Machine accounting of terminal usage is optional.

Minimum Hardware:	8K PDP-8/I, DECtape, a machine readable clock such as KW8I or the RC clock in the AXØ8 is highly desirable
Other Programs Needed:	Single user and four-user FOCAL '69 are included
Source Language:	PAL-D and FOCAL

DECUS NO. FOCAL8-212

Automated Terminal Usage Accounting for Four-User FOCAL

G. E. Moore, L. S. McGimsey, C. L. Davis
Submitted by: Chester L. Davis, Western Kentucky University, Bowling Green, Kentucky

Machine accounting of the usage of eight terminals connected to two PDP-8/I computer systems at the Instructional Computer Laboratory of the University of Kentucky has been implemented. Programs for emulating a programmable clock, recording usage data, sorting, storing transaction records on DECtape and summarizing usage are presented.

Minimum Hardware:	8K PDP-8/I, DECtape, machine readable clock such as KW8I or the RC clock in the AXØ8
Other Programs Needed:	Single-user and four-user FOCAL 69 are included in the system
Source Language:	PAL-D and FOCAL

DECUS NO. FOCAL8-213

FOCAL Random Number Generator

Dr. Ronald S. Remmel, Princeton University, Princeton, New Jersey

A short, 6 line routine for generation of random numbers in FOCAL.

Minimum Hardware:	Any machine capable of handling FOCAL
Source Language:	FOCAL

DECUS NO. FOCAL8-214

FDSK, An Overlay for FOCAL to Read Data - Or Program - Files from the PS/8 Systems Device

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

FDSK provides 8K FOCAL with a minimum-core access to a mass-storage device: the PS/8 system-device. It enables the user to process data files (on the system-device) preprocessed by other programs. It can be used to run FOCAL batch-wise.

As FOCAL was used to perform the last step in the processing of data, only a READ on the system-device was implemented. The data transfer is in ASCII format.

Minimum Hardware:	8K PDP-8; 64K Disk or DECtape
Other Programs Needed:	FOCAL '69 8K Overlay; PS/8 Programming System
Storage Requirement:	45_8 locations in Field Ø; 645_8 locations in Field 1
Source Language:	PAL-8, PAL III

DECUS NO. FOCAL8-215

FOCAL 1969 Octyl Loader

F. R. Johnson, Dow Badische Company, Freeport, Texas

This octyl loader will allow the user of FOCAL 1969 to load a tape in octyl format. Using this loader FNEW(X) commands can be loaded without resorting to a binary load and can be used by terminals remote from the computer itself.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL 1969
Storage Requirement:	63 core locations and a pointer
Source Language:	PAL III

DECUS NO. FOCAL8-216

FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

FARRAY uses Field 1 from top to bottom (competitively with the text area) for the storage of one - or two - dimensional arrays. Arrays can be defined in integer or 3- or 4- word floating point format. Arrays can be created or deleted dynamically during program execution.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	FOCAL '69; 8K overlay; 4 word overlay
Storage Requirement:	106_8 locations Field Ø; 514_8 locations Field 1
Restrictions:	A FARRAY function cannot be called within itself
Source Language:	PAL-8, PAL III

DECUS NO. FOCAL8-217

Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions

U. K. Shivadev, Harvard University, Cambridge, Massachusetts

This program solves any two first order ordinary differential equations simultaneously using Hamming's fourth order algorithm.

Minimum Hardware:	8K PDP-8/E; Paper tape reader

DECUS NO. FOCAL8-217 (Continued)

Other Programs Needed:	DEC-08-LBAA-PM Binary Loader and DECUS NO. FOCAL8-148 FOCL.S 8K
Source Language:	FOCL.S (DECUS NO. FOCAL8-148)

DECUS NO. FOCAL8-218

FOCAL Overlay CHAIN

Herbert Zimmerman, Digital Equipment GmbH, Cologne, Germany

The overlay CHAIN was written to minimize the amount of hardware for the sophisticated usage of FOCAL. Two basic programs are included - a program to build a system tape and to call the various FOCAL-Interpreter configurations, and the overlay CHAIN. The functions of the overlay CHAIN are: a common area in core for integers, 3 word and 4 word floating point numbers; store and fetch of common area on/from DECtape; a "computed GOTO" function; storage of FOCAL programs on DECtape and chaining of several programs.

Minimum Hardware:	4K PDP-8/E; Single or dual transport TD 8/E
Other Programs Needed:	Binary Loader, FOCAL DEC-08-AJAE-PB, FOCAL 4 word overlay
Storage Requirement:	Approximately 4 pages
Restrictions:	For 4K only, RIM and BIN will be destroyed
Source Language:	PAL-8

DECUS NO. FOCAL8-219

Keyboard Controlled High Speed Punch Routine for FOCAL 1969

Eddy Emmons, Royal Postgraduate Medical School, Hammersmith Hospital, London, England

A new function call has been implemented for FOCAL 1969 to allow the high speed punch to output all FOCAL commands and can be used under program control.

A new command, which is ignored by FOCAL, changes the printer IOT's for Punch IOT's. The Punch will exit to the keyboard when errors occur. These routines can be used with or without the extended functions and do not require extra user space. Either argument or command can be extended to activate other high speed output devices as KV8/I, line printer, etc. (when 8K is available).

Minimum Hardware:	4K PDP-8, 8/I, 8/L
Other Programs Needed:	FOCAL 1969
Storage Requirement:	50_8 locations
Restrictions:	FDIS and FADC are pre-emptied
Source Language:	PAL-8

DECUS NO. FOCAL8-220

Individual Tablet Assay

L. L. Alber and M. W. Overton, U. S. Food and Drug Administration, Chicago, Illinois

This program was written to process spectrophotometric readings from the laboratory auto-analyzer system. The experimenter performs the analysis in the usual manner and types in the instrumental reading at the computer station. The amount of drug per tablet and percent of declared is calculated and printed out before proceeding to the next entry. Upon completion, the average found per tablet and the average percent of declared is listed.

Minimum Hardware:	8K PDP-8
Source Language:	8K FOCAL 1969

DECUS NO. FOCAL8-221

LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation

Dr. James E. Gano and Dr. H. Bradford Thompson, University of Toledo, Toledo, Ohio

The Stern-Volmer Equation, often utilized by photochemists to treat data, in its most general form (reactive and quenchable triplet and singlet states) is processed by an iterative least squares approach applicable to such nonlinear equations.

Minimum Hardware:	8K PDP-8; To employ plotting option AXØ8 and XY recorder must be included
Storage Requirement:	5114_8
Source Language:	8K FOCAL

DECUS NO. FOCAL8-222

Center of Gravity Calculations

Joel D. Scheraga, Stamford High School, Stamford, Connecticut

This program, written especially for students of Model Rocketry, enables the user to determine the center of gravity of the rocket and the weight of the rocket 1. minus the engine; 2. including the engine; 3. at the time of burnout.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	DECUS NO. FOCAL8-52a
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-223

FOCLX, 1972

Bob Cronin, Belmont Hill School, Belmont, Massachusetts

This is a 4-user, expanded version of FOCAL 1969, similar to FOCAL, AMITY (DECUS NO. FOCAL8-136). Added features are change core function and examine core function.

DECUS NO. FOCAL8-223 (Continued)

Suggestions for application of these functions are included in the write-up.

Minimum Hardware: 8K PDP-8, 1-4 ASR33 with associated interfaces
Restrictions: No high speed reader routine
Miscellaneous: Tape is punched in XCBL format (See DECUS NO. 8-26D)
Source Language: PAL III

DECUS NO. FOCAL8-224

SPASTIC - A System for Programming Angles, Scaler and Timer, by Internal Counting

C. Richard Desper, Army Materials and Mechanics Research Center, Watertown, Massachusetts

The FOCAL interpreter has been modified to control a simple PDP-8/L interface for X-ray diffraction experiments. Control operations are accessed through a set of FOCAL functions which control four stepping motors, an internal data break scaler, a timer based on crystal clock interrupt, and the X-ray shutter solenoid.

Minimum Hardware: 4K PDP-8, ASR33, Special X-ray interface DECSPEC 08 0239 D (300Hz clock, data break scaler, solenoid driver, 4 stepping motor drivers
Other Programs Needed: FOCAL 1969
Restrictions: Not for PDP-8/S
Source Language: PAL III

DECUS NO. FOCAL8-225

Loan Amortization Schedule

Adrian Demayo, Department of the Environment, Ottawa, Ontario, Canada

Three computer programs to calculate a loan (mortgage) amortization schedule under various circumstances.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL '69

DECUS NO. FOCAL8-226

Frequency Transformation Program

Klaus Lickteig, Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

Various Fourier transformation methods can be applied when using the Frequency Transformation Program. The following methods are applied:

1. Different integration methods: Simpson and trapezoidal integration; 2. Using a lag window: "hanning" and "hamming;" and 3. Fast Fourier Transformation. By means of an example, a Critical Comparison of the methods is made.

Minimum Hardware: 8K PDP-8/I or 8/E, ASR33, HSR (optional)
Other Programs Needed: FOCAL 1969 (DEC-08-AJAE-PB); 8K Overlay (DEC-08-AJIE-PB); MODV-Choice (FOCAL8-135)
Source Language: FOCAL 1969, PAL III

DECUS NO. FOCAL8-227a

FOCL/F - An Extended Version of 8K FOCAL/69

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

FOCL/F is a version of FOCAL language which implements several extensions for increased power and versatility. Among these are: user defined functions, user defined interrupt service, execution of machine language instructions from FOCAL, arrayed variables, PS/8 compatibility, line number computation, extended commands, ASCII character commands, links for ease of addition of user assembly-code subroutines, new TTY-high speed reader control commands, A PS/8 overlay is available for file handling from FOCAL, which permits device independent program calling/saving, variable files, and ASCII files. FOCL/F version 12/1/72 is closely compatible with FOCAL-10, the newly released implementation of FOCL/F on the DECsystem-10 by Rob Warnock III at the chemistry department of Emory University. This document includes additions to the earlier version dated 6/1/72.

Minimum Hardware: 8K PDP-8
Other Programs Needed: PS/8 or OS/8 for PS/8 overlay
Source Language: PAL

DECUS NO. FOCAL8-228

Great Circle Distance Between 2 Points

A. Moses, Computer Applications Engineering Company, El Paso, Texas

Given the degrees and minutes of latitude and longitude of any 2 points on the surface of the earth, this program calculates the angle at the center of the earth between the 2 points and the great circle distance. Uses a spherical earth with 3960 mile radius.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-229

H-800 Wiring Diagrams

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

A DEC H-800-W connector is diagrammed and wire lists, pin diagrams and change orders randomly prepared for it. A second program handles real cases for one connector.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions: Will cause trouble if used with other versions of FOCAL
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-230

CALCOMP Plotter FNEW PLOTX

P. R. Bell and M. G. Roberts, Digital Equipment Corporation, Albuquerque, New Mexico

This FNEW function uses a modified PLOTX to draw lines and reset the current position to any coordinate rather than just the origin.

Minimum Hardware: 4K PDP-8 with CALCOMP plotter
Other Programs Needed: FOCAL - 69
Source Language: PAL-8

DECUS NO. FOCAL8-231

Extended Precision Sine and Cosine for 4-word FOCAL

Dr. H. B. Thompson, University of Toledo, Toledo, Ohio

This patch provides sine and cosine routines commensurate with the extended precision of 4-word FOCAL. Absolute error for arguments less than 2 pi is less than $3X10^{-10}$. The routine occupies slightly less memory than the original.

Other Programs Needed: 4-word version FOCAL-69
Storage Requirement: Overlay on original FOCAL 69: LOC 5200-5344
Source Language: PAL III

DECUS NO. FOCAL8-232

Roots by Inverse Interpolation

H. Bradford Thompson, University of Toledo, Toledo, Ohio

This subprogram uses a modified inverse interpolation (regula falsi) method to find roots of any continuous function. The user may write a master program, plus subprograms to calculate the function and to store, print, or employ roots, to fit his individual needs.

Other Programs Needed: FOCAL (any version)
Source Language: FOCAL

DECUS NO. FOCAL8-233

A FOCAL-Correlation Program for the LAB-8 System
1. Auto- and Cross-Correlation Program
2. Auto-Correlation Program

Klaus Lickteig, Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

If there are analog measurement signals of low frequencies, a correlation analysis can be made with a FOCAL program. 1) Program 1: An auto- and cross-correlation operated simultaneously. 2) An auto-correlation program with output of data on the teletype should be an example of the possibility of developing out of the above program.

Minimum Hardware: 4K PDP-8/I or PDP-8/E with AXØ8, A/D converter, ASR33
Other Programs Needed: FOCAL 1969 (DEC-08-AJAE-PB)
Source Language: FOCAL, PAL III

DECUS NO. FOCAL8-234

Action Indicator Calculator

Roger Geffen, Data Research Associates, Wayland, Massachusetts

A parameter dependent on price and volume is calculated for a succession of days or weeks, and a cumulative total of this parameter is printed out along with the current value and a line number, which may be the day of the month. Some ability to recover from errors, and the ability to terminate the program at will are incorporated.

Minimum Hardware: PDP-8E, 8K
Other Programs Needed: FOCAL 1969 (DEC-08-AJAE-PB); DECUS NO. FOCAL8-153
Source Language: FOCAL 1969

DECUS NO. FOCAL8-235

MPS Radiation Pattern Program

John G. Morey, Marvelwood School, Cornwall, Connecticut

The program will tabulate the radiation pattern shape (in millivolts per meter at one mile) of any vertical element directional antenna array. Extent of tabulation, number of towers and operating values of each tower (based with reference to one common point) are determined by user input.

Minimum Hardware: 4K PDP-8, ASR33, low speed reader
Restrictions: Sine and cosine functions necessary. Handles maximum of 10 towers
Source Language: FOCAL 1969

DECUS NO. FOCAL8-236

Polynomial Curve Fitting (Streamlined Programs)

Dr. J. H. Battocletti, Medical College of Wisconsin, Milwaukee, Wisconsin

Near-ultimate streamlined programs to allow the greatest number of data points and the largest order as possible, are presented. Two are for the normal polynomial; one forces the fit to go through zero. The third uses the Chebyshev polynomial. Point-by-point error and total RMS error are calculated.

Minimum Hardware: 4K PDP-8 with teletype
Source Language: FOCAL 1969

DECUS NO. FOCAL8-237

Bond Computations

Robert Zuch, White Plains High School, White Plains, New York

The Bond Computations program provides for the valuation of

DECUS NO. FOCAL8-237 (Continued)

coupon bonds. Given the settlement date, maturity date, par value, coupon rate, and either the yield rate or dollar price of the bond, the program will find the yield rate or dollar price, the principal, accrued interest, and the final money. The program will evaluate bonds called before maturity, and will provide for a commission on the dollar price of the bond.

Minimum Hardware: 4K PDP-8, TTY, Tape Reader
Other Programs Needed: FOCAL 4-word overlay
Source Language: FOCAL 1969

DECUS NO. FOCAL8-238

Millikan Oil Drop Experiment

Advanced Topics Class WMRHS
Submitted by: D. Baird, W. McGee, L. Pierce, White Mountains Regional High School, Whitefield New Hampshire

FOCAL simulation of the classical Millikan experiment based on the BASIC simulation "CHARGE" produced by D. Scarl, A. Caggiano, and programmed by C. Lasik for the Huntington Two project.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-239

DIV - Program for Division

Helmut Doepner, Institut fur Physikalische Chemie, Kiel, Germany

Computes and types the repeating decimals that appear in a fraction. Many of the limitations that appear in the program on pages 11-57 and 11-58 of the Programming Languages Manual, 1970, which is useful only for fraction < 1, have been removed.

Minimum Hardware: 8K PDP-8
Source Language: 8K FOCAL 1969

DECUS NO. FOCAL8-240

Science Fiction Quiz

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This is a short, multiply choice literary quiz designed expressly for science-fiction readers.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-241

Satellite Orbital Parameters

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

A short program to determine the parameters of orbiting satellites. Inputs of the radius of the planet and the acceleration of gravity at the planet's surface result in information concerning the orbital velocity and period for any stated altitude above 90 miles.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-242

Solution of Linear Equation Systems with Symmetrically Matrix

K. Wagner, Technische Universitat Berlin, Berlin, Germany

The program gives the solution-vector, an approximate error-vector and the condition number of a linear equation system with symmetrically matrix.

Minimum Hardware: 8K PDP-8E
Other Programs Needed: 8K overlay
Source Language: FOCAL

DECUS NO. FOCAL8-243

Analysis of Variance for One-Two- and Three-Treatment Designs for a PDP-8

Robert Breaux, Texas Tech University, Lubbock, Texas

These programs provide a quick and easy analysis of variance. Modification of error terms to fit particular needs in biology, agriculture, medicine, etc., can be done easily. Output includes terms for pooling error terms, mean comparisons and trend analysis.

Minimum Hardware: 8K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-244

HANGMAN IV

Andrew Layman, Stamford High School, Stamford, Connecticut

This program will allow user to play Hangman with only 4K. It is virtually idiot-proof and simulates non-computer game in playing style almost perfectly.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions: Delete Functions
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-245

Executive and Utility Routines for FOCLX, 1972

Robert Cronin, Belmont Hill School, Belmont, Massachusetts

These routines contain a header change for Quad FOCLX which will change the normal header message to any 12 character string typed by the user; a program to unpack and print a Quad FOCLX user buffer; a binary punch routine, and a tape label program.

Minimum Hardware:	8K PDP-8/I with 4 ASR33's and associated PT08's
Other Programs Needed:	FOCLX System (DECUS NO. FOCAL8-223)
Source Language:	FOCLX, 1972 (DECUS NO. FOCAL8-223)

DECUS NO. FOCAL8-246

Undefeatable FOCAL TIC-TAC-TOE

Henry K. Portner
Submitted by: Robert Cronin, Belmont Hill School, Belmont, Massachusetts

An undefeatable TIC-TAC-TOE program based upon a "Magic Square Algorithm."

Minimum Hardware:	4K PDP-8 series with console keyboard
Other Programs Needed:	Any FOCAL dialect
Source Language:	FOCAL '69

DECUS NO. FOCAL8-247

FNEWS Overlay to Use Hogh Speed Punch with FOCAL Program

Alessandro Zanon, Istituto Nazionale di Fisica Nucleare, Legnaro (Padova), Italy

This overlay adds three new functions to FOCAL-1969 and modifies the scope routine. One of these functions may be used to write a very short routine enabling the high speed punch

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL-1969 (DEC-08-AJAE-PB)
Source Language:	PAL-D

DECUS NO. FOCAL8-248

FOCTXT - Text Input-Output Patch to FOCAL-1969

F. R. Johnson, Dow Badische Company, Freeport, Texas

FOCAL was developed to be used as a problem solving language. As such, input to a user program is restricted to numeric entries. This patch allows two new functions, FRSC(X) (Read String of Characters) and FTSC(X) (Type String of Characters). These functions allow the user of FOCAL to input and output text that is not included in the body of the user program.

Minimum Hardware:	Any configuration which supports FOCAL
Other Programs Needed:	FOCAL-1969
Storage Requirement:	One page
Miscellaneous:	This program was developed on a PDP-5
Source Language:	PAL III

DECUS NO. FOCAL8-249

Payroll Listings and Totals

John A. Villano, CAM-A-TON, Waterbury, Connecticut

This routine uses all 72 characters of the teletype to print payroll information for each employee on one line and also outputs totals at the end of the payroll. A data tape, with leader-trailer between employees, prepunched with the initial ASK information of name, marital status, number of dependents and a one or zero depending upon whether an insurance payment is to be deducted, allows the operator to merely enter the number of hours worked. The routine will handle specified amounts of withholding and will skip FICA when the limit is reached.

Minimum Hardware:	4K PDP-8
Restrictions:	Employees' names limited to 7 characters and must not end in "E". Deleting insurance deduction column would permit 11 characters
Miscellaneous:	Object computer - PDP-8/F
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-250

Six Curves - GMS037

Joseph P. DiBella, General Management Systems, Miami Springs, Florida

Used to calculate six regression equations for a set of bivariate data. Regression coefficients and the index of determination are computed for a linear equation and five common non-linear equations. The six curve types used are:

1. Y=A+B*X
2. Y=A*B↑X
3. Y=A*X↑B
4. Y=A+B/X
5. Y=1/(A+B*X)
6. Y=X/(B+A*X)

There is no input limit for the total number of observations.

Minimum Hardware:	4K PDP-8/E, ASR33
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-251

"WORD" - Character Generation Using FOCAL's FDIS Function

Willard L. Craft and Michael H. Jacobitz, Adrian College, Adrian, Michigan

"WORD" is intended as a demonstration of a modification to

DECUS NO. FOCAL8-251 (Continued)

FOCAL's FDIS function. The game is similar to "Hangman," with both the computer and the operator thinking of a word and then trying to guess the other's word, letter by letter. A patch to extend the program's vocabulary is included. Information concerning the modification is also included.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 1969

DECUS NO. FOCAL8-252

12.K Overlay for FOCAL

Andrew F. Bauer, Standard Telephone & Cables Ltd., Basildon, Essex, England

This program overlays 4 word 8K FOCAL to give FOCAL the use of 661 variables stored in Field 2 (excluding the last page). No special functions or definitions are necessary - the overlay in no way affects the normal operation of FOCAL.

It should be particularly useful to PS/8 users with TD8E DECtape who require a minimum of 12K to make better use of the core available.

Minimum Hardware: 12K PDP-8
Other Programs Needed: FOCAL '69 (DEC-08-AJAE-PB), INIT, 4-word, 8K Overlays
Source Language: PAL

DECUS NO. FOCAL8-253

Solution to Any Equation Involving One Variable

Peter Cornish, Trinity Grammar School, Kew, Melbourne, Victoria, Australia

This program solves the equation F(X)=0 through Newton's method of iteration. The computer asks for F(X), F'(X), and an approximation to X. The computer then works out a better solution, accurate to 6 or 10 significant figures, depending on the sort of FOCAL being used. When there is more than one value for X, the value closest to the approximation will be found out.

This program can be used with FOCAL's extended functions IN.

Minimum Hardware: PDP-8 with TTY
Restrictions: User must be able to differentiate F(X)
Source Language: FOCAL 1969

DECUS NO. FOCAL8-254

Patch to Allow Computed Line Numbers in FOCAL, 1969

Eben F. Ostby, RR#1, Box 10, Hampton, Connecticut

This patch loads over the routine XGETLN in FOCAL, modifies that routine to allow for computed line numbers, returns the correct value for LINENO with evaluatable arguments. In addition it still allows the use of the argument ALL.

Minimum Hardware: PDP-8
Restrictions: Disables ADC function; not usable with 8K and 4 word overlays. Argument for evaluatable line numbers must not start with letter "A"
Source Language: PAL

DECUS NO. FOCAL8-255

Repeating Decimal

Glen Larson
Submitted by: Kevin Willoughby, Attleboro High School, Attleboro, Massachusetts

A short, simple program to type the decimal equivalent of two numbers as a repeating decimal. This routine is fancier than the one in DECUS NO. FOCAL8-33, as it can handle fractions greater than one, and the output is self-terminating.

Minimum Hardware: PDP-8
Other Programs Needed: FOCAL, 1969
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-256

OPTION $

Horace D. Stephens, Waynflete School, Portland, Maine

This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) enables two OPTIONs, OPTION $ and OPTION F. OPTION $ makes F a legal variable identifier and makes $ the function label. (FSQT(4) becomes $SQT(4).) OPTION F restores F as the function label and makes F an illegal variable identifier. The patch will work with FOCAL 5/69 with or without the extended functions and with or without DECUS NO. FOCAL8-189. Two of FOCAL's OPTIONs must be replaced with this patch. Information is included to permit the user to select which OPTIONs to trade.

Minimum Hardware: 4K PDP-8
Restrictions: Replaces two of FOCAL's OPTIONs
Source Language: Machine Language

DECUS NO. FOCAL8-257

LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM

William Murray, 4164 Shady Valley Drive, Arlington, Texas
Submitted by: Sally Richards, Digital Equipment Corporation, Maynard, Massachusetts

Three short routines demonstrating the random generation function of FOCAL 5/69 (DECUS NO. FOCAL8-52a).

Minimum Hardware: PDP-8
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-258

Hearing Loss Simulator

Thomas H. Townsend, Area of Communication Disorders, Dept. of Speech, Central Michigan University, Mt. Pleasant, Michigan

The "Hearing Loss Simulator" program enables the Audiology student to follow clinical testing procedures to obtain thresholds on a hearing loss simulated by the computer. The student has all the options which are available on the clinic audiometer. These include the choice of six (6) frequencies, the ear to be tested, the pure-tone presentation mode, the masking level in the non-test ear, and the hearing threshold level of the pure-tone.

Minimum Hardware:	4K PDP-8/L and ASR33
Other Programs Needed:	FOCAL, 1969
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-259

High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69

Jonathan Grobe, State University of New York at Stony Brook, Stony Brook, New York

Three modifications have been made to FOCAL 69. Punch is the new Type command for the high speed punch (Type operates low speed punch only; Punch operates high speed punch only). CRTL/W sets up the high speed punch for the Write command. FRAN is replaced by an improved random number generator, FRAN8 (DECUS NO. FOCAL8-150), but modified so it will also work with MODV (DECUS NO. FOCAL8-135). No user storage areas are affected, since these overlays occupy locations formerly used by FRAN, the Library command, and the Interrupt Processor.

Minimum Hardware:	PDP-8, High Speed Punch, ASR33
Other Programs Needed:	FOCAL, 1969 (DEC-08-AJAE)
Restrictions:	Library command and Interrupt Facility are unavailable; CTRL/C doesn't work
Source Language:	PAL III

DECUS NO. FOCAL8-260

Arithmetic and Geometric Progressions

J. Pressley, 33 Belvedere Avenue, Glen Waverly, Victoria 3150, Australia

This program will find any number in an arithmetic or geometric progression and will add the first n terms of that progression.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-261

Chi Square Utility Package, CHISQR

H. A. Taylor, Rutgers University, New Brunswick, New Jersey

Computes X^2 for a) 1xL frequency table, testing uniformity of frequencies; b) KxL frequency table, as a test of independence; c) 2x2 correlated contingency table, as a test for the significance of change or other related responses from the same individuals. For any 2x2 table, automatically applies Yates' correction for continuity if any expected value lies between 5 and 10; for a 2x2 test of independence, automatically applies Fisher's exact probabilities method if any expected value is less than 5.

Minimum Hardware:	4K PDP-8, TTY
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-262

Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug

R. F. Mais, R. D. McCook, Y. T. Oester, Research Service, Hines V. A. Hospital, Hines, Illinois

The two programs "Fraction Bound" and "Total Drug" provide for the calculation of fraction drug bound or /total drug concentration for a given total drug concentration or / fraction drug bound calculated from the usual protein binding constants of number of sites N(1) and N(2) and the corresponding association constants K(1) and K(2) and the protein concentration P. The programs are written in FOCAL for the PDP-Lab 8E with 4K core. The output is fraction bound (FB) or total drug (CO), free drug concentration (C), bound drug to protein ratio (R), R to free drug ratio (R/C), and fraction of protein sites occupied (FP).

Source Language:	FOCAL 1969

DECUS NO. FOCAL8-263

ROOTS, A Polynomial Root Finder

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts

ROOTS solves second, third and fourth order polynomial equations whose coefficients are real. It finds all real and complex roots. It calculates the roots directly, from closed form solutions, so the results (which are exact solutions, not approximations) are obtained virtually instantaneously.

Minimum Hardware:	PDP-8
Source Language:	PS/8 FOCAL 1971

DECUS NO. FOCAL8-264

MEMORY, A Children's Game

Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

MEMORY is a children's game with paired cards, programmed for the KV8 display system in FOCAL. It relies on the player's capability to remember which cards lie on a table and where. The game is played with the cursor and interrupt-bar, and displayed on the KV8 display system.

Minimum Hardware:	8K PDP-8, KV8 display system with VT01 storage display and Joystick-interrupt-bar
Other Programs Needed:	8K FOCAL and 8K FOCAL Display for KV8 (DECUS NO. FOCAL8-154)
Source Language:	PAL-8, PAL-D

DECUS NO. FOCAL8-265

LISTAL

Lawrence Moss, University of Vermont, College of Medicine, Burlington, Vermont

LISTAL is a PS/8 FOCAL utility program that will dramatically determine the FOCAL programs on a given device and then individually lists each program on the teletype (or lineprinter if available). No operator interview is required and listing proceeds until all .FC files have been listed.

Minimum Hardware:	8K PDP-8, PDP-12 or LINC-8
Other Programs Needed:	PS/8 or OS/8, PS/8 FOCAL 1971 (DECUS NO. FOCAL8-177)
Source Language:	PS/8 FOCAL, 1971

DECUS NO. FOCAL8-266

STATPACK, An Interactive Statistical Package

Lars Palmer, A B Hassle, Molndal 1, Sweden

STATPACK is a statistical package written in FOCAL with a main aim being to give an interactive program with a high degree of convenience for the user. A large number of different statistical analysis are included in the program and can be reached from the keyboard with the material in core. The material has only to be entered once and is kept in core or written into a data file as requested by the user. The programs also contain accessory routines for calculating percentages and other functions of the input material and for changing, correcting and listing the material.

Minimum Hardware:	OS/8 System
Other Programs Needed:	PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language:	FOCAL

DECUS NO. FOCAL8-267

BLACKJACK for FOCAL, 1969

Jeffrey Scott, 8604 Bunnell Drive, Potomac, Maryland

This program plays Blackjack with a user. The computer acts as dealer and computes all winnings and losses. After a full deck of 52 different cards is dealt by the dealer, the teletype bell rings to show that a new deck has been started. The computer usually wins, but it is not a perfect player.

Minimum Hardware:	PDP-8
Other Programs Needed:	FOCAL, 1969 (DEC-08-AJAE-PB)
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-268

FX Function for Random Access Files

Lawrence Moss, Cardiopulmonary Lab., University of Vermont, Burlington, Vermont

The function FX is a random access data function for use with PS/8 FOCAL. It allows the user to build and handle data files in a random fashion, rather than in the sequential pattern which is standard with PS/8 FOCAL.The maximum array size is 2047 floating point variables, of either six or ten digit precision.

Minimum Hardware:	8K PDP-8 or PDP-12 with mass storage device
Other Programs Needed:	PS/8-12 or OS/8-12, OMSI PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language:	PAL-8

DECUS NO. FOCAL8-269

4K FOCAL '69 Speed-Up Patches

Jim Crapuchettes, Frelan Associates, Menlo Park, California

These changes are to a number of the internal routines for FOCAL '69, but they could be adapted to FOCAL8. In most cases, no changes to the functions of the routines have been made. These patches were developed after an extensive program of timing the execution of FOCAL.

Minimum Hardware:	4K PDP-8 (Source file is on OS/8 DECtape)
Other Programs Needed:	FOCAL '69
Source Language:	PAL-8

DECUS NO. FOCAL8-270

MONOPOLY

C. C. Wilton-Davies, R. N. Physiological Laboratory, Alverstoke, Hants, United Kingdom

The computer acts as "Banker" in the English version of the well-known board game. Storage limitations are overcome by

DECUS NO. FOCAL8-270 (Continued)

using eight of the programs as subroutines of the ninth, master program. Up to eight players are allowed, who may buy and sell properties with each other as well as from the bank, raise and settle mortgages, and buy houses to raise the rents on their properties. "Chance," "Community Chest" and dice throws are determined by random numbers, and jail awaits those who throw three doubles in a turn, or who are otherwise sent there.

Minimum Hardware: 8K OS/8 System
Other Programs Needed: PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language: PS/8 FOCAL

DECUS NO. FOCAL8-271

Modification of FOCL/F for Data Acquisition and Control

Douglas E. Wrege, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

It is the aim of this paper to help the user to code specific routines in FOCAL™ so that his dialect of FOCAL can be applied to his application (without being forced to understand in detail all the workings of FOCAL). Included are descriptive discussions of how FOCAL works, the philosophy of the language, and sections technically oriented toward helping the user actually code his additions. This paper is an extention of DECUS NO. FOCAL8-17 and includes most of the discussions contained therein. The particular versions of FOCAL described will be FOCAL/69 and FOCL/F, the latter being a version of 8K FOCAL/69 with modifications by the author allowing assembler patches to be more easily added. (DECUS NO. FOCAL8-227a.)

Miscellaneous: Documentation only

DECUS NO. FOCAL8-272

Punched Paper Tape Generator With Randomization Using FOCAL (1969)

Derek Wakelin, Department of Psychology, King's College, Old Aberdeen, Scotland

A FOCAL version of a program containing a random rectangular distribution generator for the production of punched paper tapes for controlling experiments.

Minimum Hardware: 4K PDP-8/I, TTY
Other Programs Needed: FOCAL - 1969
Source Language: FOCAL - 1969

DECUS NO. FOCAL8-273

The Phi Phenomenon

Dr. Thomas Biddle Perera, Barnard College, Columbia University, New York, New York

This program allows the display of the Phi Phenomenon; producing apparent motion from two stationary stimulus dots. It is a simple, easily modified display program using FOCAL on a PDP-8/e equipped with 4K memory, a VC8/E display controller, and a display oscilloscope. The program provides for easy modification of time, direction, and distance parameters to study their contributions to the effect.

Source Language: FOCAL, 1969

DECUS NO. FOCAL8-274

FOCAL 5/69 Input Buffer Patch

Vincent E. Perriello, CAM-A-TON, Waterbury, Connecticut

Patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) to enable data-tape read-in without causing input buffer overflow. The patch is compatible with the 8K (DECUS NO. FOCAL8-189) modification, and like the 8K patch, is patterned on a similar modification in FOCAL 1969.

Minimum Hardware: PDP-8/E, 8/F, 8/M with TTY
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: PAL III

DECUS NO. FOCAL8-275

Teletype Histogram and Statistical Analysis of Data Set Extended and Corrected by Teletype

Pat Walsh and Art Miller, University of Illinois Medical Center, Chicago, Illinois

Small number samples (L400) are entered by teletype with resulting teletype listing of mean, standard deviation, variance standard error and total number with histogram display. Error removal sequence allows modification of incorrectly entered input.

Minimum Hardware: LAB-8/L, TTY
Other Programs Needed: FOCAL-8
Source Language: FOCAL '69

DECUS NO. FOCAL8-276

The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data

Pat Walsh and Art Miller, University of Illinois Medical Center, Chicago, Illinois

The purpose of this program is to apply a statistical measure, the Kolmogorov-Smirnov non-parametric test, to samples or data greater than 40 in number, and to suggest whether the two samples are from the same population.

Minimum Hardware: LAB-8, TTY
Other Programs Needed: FOCAL '69
Source Language: FOCAL '69

DECUS NO. FOCAL8-277

Newton Binomial

Kevin C. Willoughby, Attleboro High School, Attleboro, Massachusetts

This program expands the Newton binomial ($(A+B)^N$). Although the basic routine is fairly simple, the output is rather elaborate.

Instructions for use with various versions of FOCAL are included.

Other Programs Needed: FOCAL
Source Language: FOCAL

DECUS NO. FOCAL8-278

A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$

Lloyd Woolner, Fisheries Radiobiological Laboratory, Lowestock, Suffolk, England

The program evaluates the values of the parameters A and K in the equation $C = A\ (1-e^{-Kt})$ by an iterative method, which only requires a starting value for A. As well as calculating A and K, it produces the theoretical values for every t_i and carries out a goodness of fit test.

Minimum Hardware: 4K or 8K PDP-8/L
Miscellaneous: Please specify 4K or 8K when ordering
Source Language: FOCAL '69

DECUS NO. FOCAL8-279

MUSECL MUSI6

David Salzman, Belmont Hill School, Belmont, Massachusetts

This program generates measures of music in the treble clef, within the range from middle-C to G'. Selection of the notes is restricted to the twelve naturals in this area; and tones are determined from within the structure of one of several chords: C-major, F-major, or G-major. The beats are variations of 1/16, 1/8, 1/4, 1/2 and whole-notes. Each measure consists of a sequence of notes from one of the chords, in the form of one or more beats, totaling the length of the measure $\frac{b}{4}$, such that the user defines b shortly after the program begins.

Source Language: FOCALX, 1972 (DECUS NO. FOCAL8-223)

DECUS NO. FOCAL8-280

Improved Multiply Loop for FOCAL

Jim Van Zee, University of Washington, Seattle, Washington

This 34 word patch provides a 25-35% reduction in FOCAL's multiply time with a PDP-8/E, F, or M computer. Use is made of the MQ register. The patch is 8 words shorter than the original code and works with FOCAL '69 or FOCAL '71 and presumably most other versions as well.

Source Language: PAL-8

DECUS NO. FOCAL8-281

French Language FOCAL, 5/69

Peter J. Andes, St. Anthony's High School, Smithtown, New York

This patch is designed to convert all the commands, functions, and options of FOCAL, 5/69 (DECUS NO. FOCAL8-52a) into the French language. The patch is in two parts, English to French and French to English.

Minimum Hardware: 4K PDP-8/L, TTY
Other Programs Needed: FOCAL, 5/69 (DECUS NO. FOCAL8-52a)
Restrictions: Applicable only to FOCAL 5/69. Extended functions necessary
Source Language: PAL III

DECUS NO. FOCAL8-282

CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars

James R. G. Howard II and Jimmie B. Fletcher, AIL Information Systems, APO New York, New York

This program will produce a conversion chart for Dollars to Deutsch Marks and Deutsch Marks to Dollars. The initial dialog establishes the starting point and the program will then produce a conversion chart of five rates beginning at the specified starting point and ending 0.05 DM higher. The conversions are made in decade increments from $0.10 to $900.00 and from 0.10 DM to 9000.00 DM. The program could easily be modified for other currencies in a manner shown in attachment 1 to the listing. The program is also an excellent example of "FOR LOOPS" in FOCAL and the power of FOCAL in non-scientific applications.

Minimum Hardware: 4K PDP-8/I, ASR33
Other Programs Needed: FOCAL, 1969 (DEC-08-AJAE)
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-283

Improved EAE Routine for FOCAL

James Van Zee, University of Washington, Seattle, Washington

This is a greatly improved EAE patch for FOCAL which was designed for the 10 digit version, but includes a modification for the regular version as well. It makes available a total of 39 words and reduces the actual multiply time by a factor of 13-15 over the software. This is 3.5 times faster than the patch shown in the listing. In addition the results are

DECUS NO. FOCAL8-283 (Continued)

rounded off rather than truncated so the accuracy is improved too. The coding is readily adapted to the standard Floating Point Packages. See also DECUS NO. FOCAL8-284.

Minimum Hardware:	4K, KE8/I, KE8/E or KE12 EAE
Other Programs Needed:	FOCAL '69 or FOCAL-8
Source Language:	PAL-8

DECUS NO. FOCAL8-284

8/E EAE Routine for FOCAL

James Van Zee, University of Washington, Seattle, Washington

This EAE patch was specifically designed for the KE8/E and uses Mode B instructions. Both 3 and 4 word versions of the multiply and divide routines are included. The normalize routine has also been rewritten. Total space available is 78 words (10 digit version). Multiply time is reduced by a factor of 18.5 (4.5 times faster than the regular EAE patch) with the results rounded off instead of being truncated. A 1-bit normalization is performed 2-3 times faster. Programmers with KE8-I or KE12 hardward should request DECUS NO. FOCAL8-283.

Minimum Hardware:	4K, KE8/E, EAE
Other Programs Needed:	FOCAL '69 or FOCAL-8
Source Language:	PAL-8

DECUS NO. FOCAL8-285

Online Graph - With Self Determining Scale Factor

Robert M. Hashway, West Warwick, Rhode Island

Will display on TTY the graph of a function of one variable. If a function is plotted over a 'wide' range and a particular area of the graph is of interest, upon input of new coordinates new scale factors will be calculated and the graph expanded over this domain to fit into a y-axis consisting of 50 spaces.

Extended functions must be retained.

Minimum Hardware:	4K PDP-8/e, ASR33
Other Programs Needed:	FOCAL, 1969
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-286

Arithmetic Practice

R. Kenneth Walter, Webb School of California, Claremont, California

This program allows a student user to choose between operations of +, -, x, / integers or decimals and gives him 10 problems of the type he requests. Subsequent sets of problems are progressively easier, similar, or more difficult depending upon the student's percentage score.

Minimum Hardware:	4K PDP-8/L
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-287

CC-FOCAL-Q

Adrian Q. Abraham
Submitted by: A. R. D. Ramsay, Christ's College, Christchurch, New Zealand

CC-FOCAL-Q enables two versions of FOCAL to be stored on DECtape. Either can be called into core from keyboard. FOCAL programs can be saved on DECtape, and called from DECtape.

Minimum Hardware:	4K PDP-8/e with ASR33; Single transport TD8E Dectape
Other Programs Needed:	FOCAL, 1969
Restrictions:	No provision has been made for any hardware, e.g. HSR, dual DECtape or 8K
Source Language:	PAL III

DECUS NO. FOCAL8-288

FSPACE - Space Command for FOCAL '69

Jonathan Grobe, State University of New York at Stony Brook, Stony Brook, New York

A new command has been added to FOCAL 69 to output spaces. Instead of TYPE " " to output 20 spaces, one need only write X 20. A new technique is illustrated to add new commands to FOCAL -- it is not necessary to give up the Library or another command.

Other Programs Needed:	FOCAL '69 (DEC-08-AJAE)
Storage Requirement:	Locations 4525-4577 or 5325-5377
Source Language:	PAL III

DECUS NO. FOCAL8-289

TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible with the TTY Intercom Terminal to CDC6000 Computer Series

Charlotte McFaul and Harold Cohn, Naval Ship Research and Development Center, Annapolis, Maryland

This patch uses the FOCAL command, TYPE !, to punch data on paper tape in a format compatible with the TTY INTERCOM terminals of the CDC6000 computer series.

Minimum Hardware:	PDP-8 with low speed punch
Other Programs Needed:	4K FOCAL '69 (DEC-08-AJAE-PB)
Storage Requirement:	4K
Source Language:	PAL-D

DECUS NO. FOCAL8-290

Kolmogorov-Smirnov Test for Normality

Ernest M. Stokely, University of Texas, Southwestern Medical School, Dallas, Texas

This program tests the hypothesis that a given sample comes from a parent population having a normal distribution. The test is an alternative to the chi-squared test. 8K FOCAL is desirable because of the large program size. Data ranking, normalization, and comparison with values from the cumulative normal distribution are computed by the program.

Minimum Hardware:	PDP-8/I with ASR33 or equivalent
Other Programs Needed:	8K FOCAL '69
Source Language:	FOCAL '69

DECUS NO. FOCAL8-291

DRANO

Ed Vogel, Canton High School, Canton, Massachusetts

DRANO takes user's FOCAL files, one by one, most recent first, prints a file name and information, then allows user to either delete, save, or list the file. It then proceeds to the next file.

Minimum Hardware:	TSS/8, ASR33
Source Language:	PAL-D

DECUS NO. FOCAL8-292

CHCIG8

Uli Weidmann, Department of Psychology, The University, Leicester, England

CHCIG8 provides text and plotting facilities on a non-storage scope (VC8E and VR14) for the 8K PDP-8/E (LAB8/E). It has fast chaining facilities - using TD8E DECtape - for running large programs, for data handling and for presenting dynamic displays or sequences of pictures. The high-speed punch and reader can be used. CHCIG8 can run under OS/8. The ADC knobs may be used as sense switches; the content of field 1 core locations can be displayed on the CRT.

Peripherals Required:	VC8-E, VR14, TTY
Storage Requirement:	8K (+ROM if OS/8 is used)
Restrictions:	No extended functions
Miscellaneous:	ASCII tapes offered are not Source tapes for CHCIG8. They are demo programs
Source Language:	FOCAL8, FOCAL '69, PAL-8

DECUS NO. FOCAL8-293

A Laboratory and Real Time Patch With FNEW FOCAL 5/69

G. Schayes and L. Zandarin, Institut d'Astronomie et de Geophysique, Louvain-la-Neuve, Belgium

Allows laboratory experiments to be connected in real time to the computer in FOCAL language. There are three main parts:

1) A FOCAL function FNEW is created having two independent features: a) it allows PDP-8/E core memories to be read (or to be written in) in FOCAL language; b) it allows to read in or to output pulses on the DR8/EA 12 channel buffered digital I/O.

2) Pulses coming on this DR8/EA interface are creating a dynamic interrupt of the inner program by executing the FOCAL group 15 instructions (equivalent to a "DO 15").

3) The KP8E Power Fail Detect option is used to save active registers as AC, LINK and PC when a power low condition is detected in order to restart the program at the interrupt point when power is restored.

This subroutine is to be used with FOCAL TAFT 5/69 (DECUS FOCAL8-52a) and the 8K overlay for FOCAL TAFT (DECUS FOCAL8-189).

Source Language:	PAL III

DECUS NO. FOCAL8-294

Real Time FOCAL on the PDP-8 Computer

Paul T. Brady and Judy Popelas, Bell Laboratories, Holmdel, New Jersey

Real Time FOCAL (RTF) is an adaptation of FOCAL MOD-V to allow input/output statements to be executed in the FOCAL language with millisecond timing accuracy. That is, the times at which inputs occur can be determined to within one msec, and outputs can be controlled to one msec accuracy. Also included in RTF are: (1) a statistical random number generator, (2) a computed GOTO statement, and (3) a logical AND function. RTF requires a PDP-8 with 8K memory and a real time clock and can be adapted to drive a variety of 12-bit input/output devices such as the BDIO on the PDP-8/E.

Two versions of RTF are available. The principal difference between them is that the first uses a clock and two BDIO devices that operate off of the PDP-8/E Omnibus, as well as some "standard" I/O bus devices, while the second version, written for the 8/L, performs I/O exclusively with standard I/O bus modules.

Minimum Hardware:	8K PDP-8, Photoreader, Clock, general purpose 12-bit I/O registers
Restrictions:	Minor modifications would be required to tailor in/out instructions to user's devices.
Source Language:	Machine Language

July 1974

DECUS NO. FOCAL8-295

ATTND - Monthly Attendance Reporting Module

Robert M. Hashway, 1794 New London Turnpike, Apt. 52, West Warwick, Rhode Island

This program will calculate the information required for most schools in their home room teachers' monthly reports. Also, data is accumulated for the school state report. The information may be batched. The ASR teleprinter is used for input and output. This program can be operated on a PDP-8/E mainframe with 4K of 8 bit words, under FOCAL, 1969 with extended functions retained. Thus, most mathematics or science departments could process the reporting for their respective schools with a minimum of manpower.

Source Language: FOCAL '69

DECUS NO. FOCAL8-296

FOCALINUS - Molecular Geometry Calculator

H. Bradford Thompson, Department of Chemistry, The University of Toledo, Toledo, Ohio

FOCALINUS performs a variety of calculations based on description of the geometry of molecules in terms of internal coordinates: bond and dihedral angles and bond lengths. In addition cartesian coordinates of all the atoms, a variety of interatomic distances and angles may be derived, including three types of dihedral angles. FOCALINUS is a FOCAL derivative of the program LINUS, described in the Journal of Chemical Physics, 47, 3410 (1968).

Minimum Hardware: 8K PDP-8/I or 8/E
Restrictions: At most 33 atoms can be handled
Source Language: FOCAL 69 with FCOM Function

DECUS NO. FOCAL8-297

LUNGS - A System of Programs for the Calculation of Selected Cardiorespiratory Parameters

Robert R. Demers A.R.I.T., Anesthesia Research Laboratory, Rhode Island Hospital, Providence, Rhode Island

The system of programs designated "LUNGS" performs calculations to aid in the diagnosis and therapy of pulmonary disorders. Among the functions performed by the programs are: correction of blood gas data from in vitro to in vivo conditions, calculations of tidal volume, respiratory rate, minute ventilation, deadspace volume, minute alveolar ventilation, oxygen uptake, respiratory exchange ratio, alveolar-arterial oxygen difference, arteriovenous oxygen difference, Fick cardiac output, cardiac index and percentage shunt. It can be applied to patients breathing spontaneously or being mechanically ventilated. One of the system programs corrects blood gas data obtained during hypothermia and extracorporeal circulation.

Minimum Hardware: PDP-8/I; ASR33
Other Programs Needed: FOCAL 1969; 8K Utility Overlay
Storage Requirement: 8K
Source Language: FOCAL

DECUS NO. FOCAL8-298

Critical Points of a P(x) of Degree N (Real Coefficients)

Michael Lonergan
Submitted by: Brother John O'Connell, C.F.X., St. John's Prep School, Danvers, Massachusetts

This program will, in most cases, output the coordinates of all maximum, minimum and points of inflection of a P(x) of degree N. The polynomial must have real coefficients. N must be a positive integer.

Minimum Hardware: PDP-8/S
Storage Requirement: 4K (without extended functions)
Restrictions: If the second derivative (P_2) =0, the method fails
Source Language: FOCAL '69

DECUS NO. FOCAL8-299

FOPAY - Weekly Payroll Deductions and Computations

Michael H. Jacobitz, Cougar and Hunter, Inc., Flushing, Michigan

The program provides a practical weekly payroll computation for any number of employees, on either an hourly or a salaried basis. In addition to computing and deducting both federal and state income taxes, the program also computes the F.I.C.A. tax and provides for two additional deductions such as union dues, group insurance or a retirement fund. Upon completion of the program, running totals of deductions and weekly wages are printed, along with a total of the employer's weekly payroll liability.

Storage Requirement: 4K (with extended functions removed)
Source Language: FOCAL '69

CHANGES AND ADDITIONS TO DECUS PDP-8, FOCAL8 CATALOG OF JULY 1973

UPDATE NO. 1

DECUS

December 1973

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UPDATE NO. 2

PDP-8, FOCAL8 CATALOG OF JULY 1973

The enclosed pages contain changes to information contained in the above mentioned catalog and Update No. 1 dated December 1973 and additions to the FOCAL8 section. Please replace existing pages with the correspondingly numbered pages in this issue and add the new pages.

Category Index pages have been revised to include only those programs contained in the first volume of programs (July 1973, Update No. 1 and this Update). Please remove existing Category Index pages and replace them with those attached.

Category Index of programs contained in Volume II can be found in that volume.

If you have any questions concerning these catalogs, please contact us.

DECUS PROGRAM LIBRARY CATALOG

FOR

PDP-8, FOCAL8, BASIC8

VOLUME II

DECEMBER 1973

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UPDATE TO VOLUME II

OF

PDP-8, FOCAL8, BASIC8, PDP-12 CATALOG

DECUS

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This Update - June 1976

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June 1976

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I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
8-604	'GET' Command for Disk/DECtape Monitor System
8-608	FUTIL - OS/8 File Utility
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-632	RWDF32
8-633	MAC8, 8K MACRO ASSEMBLER
8-635	PAL12D
8-641	OS/8 FORMAT
8-644	MINMON - TD8E DECtape Minimonitor
8-646	DECsystem-8
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O
8-655	Patches to CINET-BASIC (DECUS NO. 8-159)
8-658	Extended Double Precision Interpretive Package
8-662	UNDEFSYBLIST - Undefined Symbol List
8-668	RAW - A Reverse Assembler of Windsor
8-676	MOVE DELETE
8-682	SCPSYS (Scope System)
8-691	ACCK Timeshare Accounting System
8-694	Teletype Line Printer Emulator Handler for OS/8
8-699	MPS External Event Common Routines
8-702	COGO-8
8-706	BITSET
8-708	EMLP: Emory Linear Programming Package
8-719	OS/8 Software for a TC58 Magtape Controls
8-721	LISP-8K
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer
8-734	Microprocessor Language Assembler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-747	STAGE2 MACRO Processor
8-749	UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined Functions for OS/8 BASIC
8-751	FORTRAN IV for OS/8 FORTRAN II Users
8-752	MIG8E2 - Monitor of Interruptions Which Are Generated by the PDP-8/E Peripherals
8-757	OS/8 Utility Package
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-768	EDAS - Editing and Assembling System
8-770	MOSS - 4K TD8E DECtape System
8-771	PRGSCH - TSS/8 Program Searcher
8-777	PDP8ASM
8-807	UTILITY ROUTINE, and Patches to the FORTRAN Compiler
8-814	PROCES: An Image Processing Program for the PDP-8/e
8-817	LABCOL: Laboratory Control and Automative Language

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
8-601	OASIS
8-606b	PIP11
8-611a	SLED - Source and Listing Editor
8-623	PAGER
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format
8-640	OS/8 EDIT PLUS
8-651	SOLMT (Sort Overlay Listings Using Magnetic Tape
8-681	CASE - Carleton Symbolic Editor
8-682	SCPSYS (Scope System)
8-731	MEMO IV
8-756	ASCON - ASCII File Converter
8-764	LIST
8-768	EDAS - Editing and Assembling System
8-774	Simple ASCII Editor and Tape Reproducer
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-785	GPATCH
8-786	TSS/8 FORMAT

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

8-601	OASIS
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-624	DUMP and LOAD, TSS/8
8-636	BEST - Binary to Symbolic Traductor
8-639	OS/8 DISASM
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 EDUsystem 50)
8-720	LSTDMP: Binary Tape Dump/Lister
8-727	Disassembler
8-733A	PDP-8/E RJE System (IBM 2780 Emulator)
8-736	Paper Tape Reader-Printer
8-738	The Business Management Laboratory
8-755	OCTYPE - Octal Memory Dump
8-763	KL8TST - KL8/E, KL8/J Diagnostic
8-765	DUMPOS - Dumps OS/8 ASCII Files
8-784	TSS/8 TTRACE and TSS/8 LTRACE
8-806	SACO: Simulation of an Analogue Computer
8-811	DYNOD: Dynamic Octal Debugger

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
8-601	OASIS
8-605	ADUMP8
8-672	XCBL and XBIN Loader
8-683	BNLOAD, TSS/8 Binary Loader
8-684	Injection Patcher - IJPA
8-701	TEXT: Readable Punch Handler for OS/8
8-730	CORVU: A Display and Teletype Input-Output Program
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal
8-776	BNPF Format Paper Tape Loader for MPS
8-803	FOLMAT
8-815	BINPUN: OS/8 Binary Punch From Core Image Files

V. DUPLICATION, VERIFICATION

8-600c	EXPIP (Extensions PIP)
8-606b	PIP11
8-663	REPROD/ Read, Punch and Verify Product
8-722	Mini-Copy
8-775	COPIER
8-791	DELAY
8-803	FOLMAT

VI. NUMBERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

DECUS NO.	TITLE
8-607	CALCU1
8-615	EAE Multiplication for 8K FORTRAN
8-621	Gray Code Conversion Package
8-625	Floating Integer Function for use with 8K FORTRAN
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine
8-658	Extended Double Precision Interpretive Package
8-678	Routine to Expand and Modify the DEC Floating-Point Package
8-685	DPSQRT - Double Precision Square Root for PDP-8
8-691	ACCK Timeshare Accounting System
8-696	DECTYP, One-Word Signed Decimal Print
8-716	Exponential Functions
8-717a	F4EAE - EAE Overlay for FRTS
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC
8-737A	Four Word Floating Point Package for MPS
8-737B	Four Word Floating Point Functions for MPS
8-737C	Rudimentary Calculator for MPS Four Word Floating Point Routines
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV
8-794	IFAC
8-796	FVWDFP: Five Word FPP
8-806	SACO:Simulation of an Analogue Computer

VII. UTILITY

8-600c	EXPIP (Extensions PIP)
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2
8-606b	PIP11
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format
8-634	MOVE
8-649	QPIP - OS/8 Directory Editing Program
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers
8-657C	TR, Binary to ASCII Translator
8-663	REPROD/ Read, Punch and Verify Product
8-667	LABLDP - A TSS/8 Tape Labeling Program
8-671	Restoring Symbolprint
8-675	INDUMP - Input Dump
8-677	STAR PIP
8-684	Injection Patcher - IJPA
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program
8-691	ACCK Timeshare Accounting System
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - EDUsystem 50)
8-698	TEKLIB

DECUS NO.	TITLE
8-701	TEXT: Readable Punch Handler for OS/8
8-714	PDPLST: PDP-8 - IBM 360/370 Cross Listing Program
8-719	OS/8 Software for a TC58 Magtape Control
8-722	Mini-Copy
8-728	MEND
8-730	CORVU: A Display and Teletype Input-Output Program
8-736	Paper Tape Reader-Printer
8-739	COPY.PA
8-742	CLOCK - A Real-Time Clock/Calendar Routine
8-743 a	FILFIX - TSS/8 File Structure Repairing and Restructuring Program
8-753	OS/8 System Output Handlers
8-754	NUMBER and REDATE - OS/8 File Utility Programs
8-757	OS/8 Utility Package
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal
8-764	LIST
8-771	PRGSCH - TSS/8 Program Searcher
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems
8-774	Simple ASCII Editor and Tape Reproducer
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape
8-780	SPLIT and SPLICE
8-789	RKCOPY
8-791	DELAY
8-795	RINROT: A Roll-in, Roll-out Program
8-798	OS/8 to RSTS Interface
8-803	FOLMAT
8-807	Utility Routine, and Patches to the FORTRAN Compiler
8-812	CASINO: Sykes Cassette Input/output
8-815	BINPUN: OS/8 Binary Punch from core Image Files
8-817	Utility Routine, and Patches to the FORTRAN Compiler

VIII. DISPLAY

DECUS NO.	TITLE
8-614	Clock Calibration
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System
8-622	KV8/I - VTØ1 Device Handler
8-637	A Flexible Data Buffer Display Routine for LAB-8 Systems
8-659	VT05
8-674	External - or RC - Clock (AXØ8) Calibration
8-682	SCPSYS (Scope System)
8-695	Real Time Display Processor for a KV8 Graphic System and KW8 Clock
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
8-730	CORVU: A Display and Teletype Input-Output Program
8-746	Device Handler for Tektronix 611 Storage Scope
8-764	LIST
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator
8-772	OS/8 Compatible VC8E Handler for Mass Storage Systems
8-773	Graphics Package for the Tektronix 4010 Under OS/8
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
8-817	LABCOL: Laboratory Control and Automation Language

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

8-608	FUTIL - OS/8 File Utility
8-610	INVENT-8
8-611a	SLED - Source and Listing Editor
8-612	ELAN - Elementary Linguistic Analysis
8-613	Interconversion Between A/D Floating Point and D/A Formats
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O
8-657A	INPUT, A Neurophysiological Data Collecting Program
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers
8-657C	TR, Binary to ASCII Translator
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program
8-706	BITSET
8-711	Microprocessor Cross Reference Program for OS/8
8-723	Function Comp.FT
8-724	Computer Catalog System
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter
8-759	USLIBA - FORTRAN II Subroutines for Binary Data Trasnfer
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-814	PROCES: An Image Processing Program for the PDP-8/e

X. PROBABILITY, STATISTICS, CURVE-FITTING

DECUS NO.	TITLE
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-652	Regression Analysis Package
8-659	VT05
8-660a	STAT
8-661	LESQ, General Non-Linear Least Squares
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals
8-673	Random Number Generators for Use With FORTRAN or SABR Programs
8-690	RANDU
8-704	ANOV1: Analysis of Variance, Unequal N
8-705	ARNORM: Area Under Normal Curve
8-707	CRSTAB: Cross Tabulation Program
8-710	MULTS: Multiple Regression Program
8-745	LEP - Linear, Exponential and Power Function Curve Fit
8-778	PFCF - Polynomial Function Curve Fitting
8-797	LSPCF: Least Squares Polynomial
8-808	Probability Density Functions
8-809	FFT or IFFT of An Analogue Signal

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program
8-617	V. A. PKS.-1 and V.A. PKS.-2, Real Time G. C. Data Integrator and G. C. Data Manipulator
8-620	The PHA-8 Data Acquisition System
8-620A	SINGS - Single Parameter, Single Precision, 1024 Channel, PHA Data Acquisition
8-620B	SINGDP - Single Parameter, Double Precision, 1024 Channel, PHA Data Acquisition and Display
8-620C	PK8L - 1024 Channel Off-Line Peak Location and Listing
8-620D	SING8K - Single Parameter, Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display
8-620E	PK8K - 4096 Channel Off-Line Peak Location and Listing
8-626	Automated Electrooculography
8-630	Pulmonary Function Laboratory Programs
8-638	GEOMAS
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-648	LOGMIN - Logic Minimization Program
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-657A	INPUT - A Neurophysiological Data Collecting Program
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements
8-665	INTVAL - A Subroutine to Measure Inter-Event Intervals
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals
8-669	BIOLSD - Antibiotic Assay Using Latin Square Design
8-680	WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System
8-712	IRSPEC: Calculation "On Line" of Far Infrared Spectra by Fourier Transform
8-718	NSD - Nominal Standard Dose
8-725	The Pipe Stress Problem on a PDP-8/F
8-740	Theorem Prover for the Propositional Calculus
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-767	Critical Path Method of Scheduling
8-773	Graphics Package for the Tektronix 4010 Under Os/8
8-781	DOCRLN - A Subroutine to Calculate Polarity-Quantized Autocorrelograms
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System
8-794	IFAC
8-799	Dose Calculation of Irregular Fields
8-800	Heat Loss Calculation
8-802	SSP Scientific Subroutine Package
8-813	DIGFIL: Recursive Digital Filter
8-814	PROCES: An Image Processing Program

XII HARDWARE CONTROL

DECUS NO.	TITLE
8-614	Clock Calibration
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-622	KV8/I - VTØ1 Device Handler
8-645	Interfacing the PDP-8 to the Printec-100 Line Printer
8-694	Teletype Line Printer Emulator Handler for OS/8
8-719	OS/8 Software for a TC58 Magtape Control
8-739	COPY.PA
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-787	LISZ - An Extended ISZ Instruction for the PDP-8/L
8-788	Using the RAR RAL Micro-Instruction as an Auxiliary Command
8-795	RINROT: A Roll-in, Roll-out Program
8-805	PTRP. PA

XIII. GAME DEMONSTRATION

8-643	LIFE
8-647	FULMIX - Complete Permutation Program
8-686	Bowling League Results, Standings and Averages
8-687	GOLF
8-688	FOOTBALL
8-700	JET AMBUSH
8-729	DS340 Demo Package
8-738	The Business Management Laboratory
8-750	Paper Tape Display
8-804	Music Program
8-810	Ping: Ping-Pong Game on Display

XIV. PLOTTING

DECUS NO.	TITLE
8-629	Graphing Subroutines for 8K FORTRAN Programs
8-670	Basic Plotting Package for OS/8 FORTRAN IV
8-713	FORTRAN Plotting Subroutines
8-715	F4 GRAPHICS
8-738	The Business Management Laboratory
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
8-817	LABCOL: Laboratory Control and Automation Language

XV. DESK CALCULATOR, BUSINESS APPLICATION

8-607	CALCU1
8-610	INVENT-8
8-703	AMORT: Incremental Amortization Schedule
8-709	FINCA: A Computer Program for Financial Statement Analysis
8-724	Computer Catalog System
8-729	DS340 Demo Package
8-738	The Business Management Laboratory

XVI. MAINTENANCE

8-608	FUTIL - OS/8 File Utility
8-614	Clock Calibration
8-624	DUMP and LOAD, TSS/8
8-744	TSTCDR - TSS/8 Card Reader Diagnostic

XVII. MISCELLANEOUS

DECUS NO.	TITLE
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2
8-616	Octal Character Equivalent
8-654	Cabrillo Test Grader
8-656	SELFDRILL - The Sloan Selfdrill Program
8-679	MAPPER
8-686	Bowling League Results, Standings and Averages
8-693	A Programmed Learning Course in Boolean Algebra
8-701	TEXT: Readable Punch Handler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator
8-769	SELFDR - The Selfdrill Program, 8K Version
8-792	PROVE-8, V.03
8-801	MORSE: Morse Code - Coder and Decoder

PAYMENT

All DECUS service charges are to help defray the cost of reproduction, handling and postage. All orders must be accompanied by cash, DECUS Coupons or Purchase Order. Please make checks payable to DECUS.

Because of the difficulties encountered by many installations in obtaining Purchase Orders for small amounts, DECUS Coupons may be ordered for any amount and used as subsequent payment for DECUS orders. Coupons are available in $1.00 and $5.00 denominations. They may be ordered as DECUS NO. 0051.

Payment for DECUS Coupons must be made in advance. Purchase Orders for coupons must be paid before coupons may be redeemed for DECUS material.

All charges are in U. S. Dollars. A $2.00 invoicing charge is added to all orders which are not prepaid.

All charges are subject to change without notice.

European Users - Payment may be made in your currency to: Martha Ries, Digital Equipment Co., Int'l-Europe, Case Postale 340, 1211 Geneva 26, Switzerland. Please refer to currency exchange charts available from that office.

Australian Users and New Zealand Users - Payment may be made in your currency to DECUS Australia, P. O. Box 491, Crows Nest, NSW, 2065 Australia. Please refer to currency exchange charts available from that office.

WRITE-UPS

With certain exceptions single copies of associated write-ups are automatically included at no charge with programs ordered and with all library tapes.

Most write-ups may also be requested without tapes. Reasonable requests (usually 15 or fewer write-ups) will be filled without charge. When more than 15 individual write-ups are requested, a service charge of fifteen cents (15¢) per write-up will apply. EXCEPTIONS: Write-ups for which an individual service charge is indicated.

Requests for multiple copies of the same write-up will be charged at a rate of $1.00 per copy (first copy free), or at the service charge indicated.

Complete sets of current write-ups for each library are available. Service Charges are:

PDP-8	$120.00
BASIC8	15.00
FOCAL8	50.00
PDP-12	25.00
PDP-11	45.00
RSTS11	40.00
PDP-6/10 & 10 (combined)	35.00
PDP-9 & 15 (combined)	25.00

TAPES

In some cases it is possible to pack programs on DECtape. Such cases will be considered on an individual basis. Please contact the appropriate DECUS Library Controller for specific information.

Programs customarily distributed on paper tape will not be packed on DECtape.

RSTS-11 programs are on disk and can be transferred to any distribution media (paper tape, DECtape, magtape or disk). Service charges will vary according to the media involved. Contact the PDP-11 controller for complete information.

All User Supplied DECtapes must be new and formatted. DECUS cannot/ will not copy programs to unformatted tapes.

When it is indicated that certain programs occupy the same tape, only one service charge will apply for any combination of programs on that tape. (Library Tapes excluded.)

When requesting magtapes, the user should specify whether 7 track or 9 track tapes are needed.

LIBRARY TAPES

There are four Library LINCtapes of PDP-12 programs. Contents of tapes and applicable Service Charges are:

TAPE	DECUS NO's.	USER TAPE	DECUS TAPE
1	12-1,2,4	$15.00	$25.00
2	12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	35.00	45.00
3	12-22, 23, 25, 30, 31, 32, 33 35, 36, 37, 41, 42, 43, 44	35.00	45.00
4	12-45, 46, 47, 51, 54, 55, 56, 57	25.00	35.00

Three Library Magtapes of DECsystem-10 programs are available from DECUS. The tapes are Failsafe, 7 or 9 track, 800 or 556 BPI. If not specified, tapes will be copied 9 track at 800 BPI. Write-ups are supplied, at no charge, for each Library Tape issued.

Tape #1a includes all currently announced 6/10 programs, plus all programs from 10-1 through 10-99 which have been announced as currently available, with the exception of 10-14, 10-34a and 10-86b.

Tape #2a includes all programs from 10-103 through 10-200 which have been announced as currently available, with the exception of 10-176, 10-179a and 10-199.

Tape #3 includes all programs from 10-201 through 10-231 which have been announced as currently available, with the exception of 10-210, 10-213, 10-215, 10-223, 10-224 and 10-227.

Servicecharges quoted are for each library tape, NOT for any combination of tapes. Requests for 9 track, 800 BPI require one 2400' Magtape for either Tape #1a or #2a. 7 or 9 track 556 BPI or 7 track 800 BPI may in some cases require an additional 600' Magtape.

Service charges for library tapes are:

	Library Tape #1a or #2a (2400' magtape)	Library Tape #3 (1200' magtape)
DECUS supplied tape	$125.00	$50.00
User supplied tape(s)	$100.00	$30.00
DECUS supplied 600' tape	$ 15.00	

Users who received previous versions of either tape #1 or tape #2 (a) may request the updated tapes by indicating date of the original purchase order, invoice or letter of credit (specify which) and in whose name the original order was issued.

Service charges for updating library tapes are:

DECUS supplied tape	$50.00
User supplied tape(s)	$25.00
DECUS supplied 600' tape	$15.00

Library Tapes previously ordered will not be automatically updated.

Programs not included on Library Tapes may be obtained as shown in catalog.

DECUS NO.	TITLE
8-600c	EXPIP (Extensions PIP)
8-606b	PIP11
8-607	CALCU1
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-610	INVENT-8
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-622	KV8/I - VTØ1 Device Handler
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine
8-632	RWDF32
8-633	MAC8, 8K MACRO ASSEMBLER
8-634	MOVE
8-635	PAL12D
8-638	GEOMAS
8-639	OS/8 DISASM
8-640	OS/8 EDIT PLUS
8-641	OS/8 FORMAT
8-643	LIFE
8-646	DECsystem-8
8-649	QPIP - OS/8 Directory Editing Program
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-659	VT05
8-660a	STAT
8-661	LESQ, General Non-Linear Least Squares
8-670	Basic Plotting Package for OS/8 FORTRAN IV
8-677	STAR PIP
8-690	RANDU
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System
8-694	Teletype Line Printer Emulator Handler for OS/8
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
8-701	TEXT: Readable Punch Handler for OS/8
8-703	AMORT: Incremental Amortization Schedule
8-704	ANOV1: Analysis of Variance, Unequal N
8-705	ARNORM: Area Under Normal Curve
8-706	BITSET
8-707	CRSTAB: Cross Tabulation Program
8-708	EMLP: Emory Linear Programming Package
8-709	FINCA: A Computer Program for Financial Statement Analysis
8-710	MULTS: Multiple Regression Program
8-711	Microprocessor Cross Reference Program for OS/8
8-713	FORTRAN Plotting Subroutines
8-715	F4 GRAPHICS
8-717a	F4 EAE - EAE Overlay for FRTS
8-718	NSD - Nominal Standard Dose
8-719	OS/8 Software for a TC58 Magtape Control
8-724	Computer Catalog System
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer
8-731	MEMO IV
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC
8-734	Microprocessor Language Assembler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-738	The Business Management Laboratory
8-739	COPY.PA
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape
8-745	LEP - Linear, Exponential and Power Function Curve Fit
8-746	Device Handler for Tektronix 611 Storage Scope
8-747	STAGE2 MACRO Processor
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter
8-753	OS/8 System Output Handlers
8-754	NUMBER and REDATE - OS/8 File Utility Programs
8-756	ASCON- ASCII File Converter
8-757	OS/8 Utility Package
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E
8-759	USLIBA - FORTRAN II Subroutine for Binary Data Transfer
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-764	LIST
8-765	DUMPOS - Dumps OS/8 ASCII Files
8-769	SELFDR - The Selfdrill Program, 8K Version
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems
8-773	Graphics Package for the Tektronix 4010 Under OS/8
8-775	COPIER
8-778	PFCF - Polynomial Function Curve Fitting
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape
8-780	SPLIT and SPLICE
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-789	RKCOPY
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV
8-794	IFAC - A FORTRAN Program for Parameter Estimation
8-795	RINROT: A Roll-in, Roll-out Program
8-798	OS/8 to RSTS Interface
8-799	Dose Calculation of Irregular Fields
8-802	SSP: Scientific Subroutine Package
8-803	FOLMAT
8-814	PROCES: An Image Processing Program

June 1976

DECUS NO.	TITLE
8-815	BINPUN: OS/8 Binary Punch from Core Image Files
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for SCOPE and Incremental plotter
8-817	LABCOL I: Laboratory Control and Automation Language
FOCAL8-301	U/W FOCAL
FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971
FOCAL8-328	CONVM: Interconversion of Mass and Volume Units

FUTURE SUBMISSIONS AND ANNOUNCEMENTS SHOULD BE CATEGORIZED USING THIS LIST

DECUS PROGRAM LIBRARY CATEGORY CODES*

00. Utility (External) Programs

- 0 Unclassified
- 1 Multiple Utility
- 2 Flowcharting
- 3 Magnetic Tape Handling
- 4 Paper Tape Handling
- 5 Disk Handling
- 6 Drum and Direct Data Devices
- 7 Graphic Display Devices
- 8 Remote Data Acquiaition

01. Utility (Internal) Programs

- 0 Unclassified
- 1 Loading
- 2 Clear/Reset Memory
- 3 Check Sum Accumulative and Correction
- 4 Internal Housekeeping
- 5 Dump to Reload/Restore Operations
- 6 File Organization
- 7 Self Checking Digit
- 8 Packed Data Handlers
- 9 Duplicators/Verifiers

02. Diagnostics

- 0 Unclassified
- 1 Status Recorders
- 2 Hardware Maintenance

03. Programming Systems

- 0 Unclassified
- 1 Assemblers
- 2 Compilers
- 3 Interpretive Systems
- 4 Input/Output Control
- 5 Report Generators
- 6 Preprocessing and Editing
- 7 Macros and Macro Generators
- 8 Functions and Subroutines
- 9 Desk Calculators

04. Testing and Debugging

- 0 Unclassified
- 1 Dumping
- 2 Tracing
- 3 Test Data Preparation
- 4 Testing Systems
- 5 Break Point Printing
- 6 Memory Verification and Searching
- 7 On-Line (DDT Type) Debuggers

05. Executive Routines

- 0 Unclassified
- 1 Monitor
- 2 Supervisors
- 3 Disassembly and Derelativizing
- 4 Relativizing
- 5 Relocation

06. Data Handling

- 0 Unclassified
- 1 Sorts
- 2 Merges
- 3 Data Transmission
- 4 Table Operation
- 5 Conversion and/or Scaling
- 6 Character and Symbol Manipulation
- 7 Information Classification, Storage, and Retrieval
- 8 List Processing
- 9 Typesetting

07. Input/Output

- 0 Unclassified
- 1 Binary
- 2 Octal
- 3 Decimal
- 4 BCD
- 5 Hexadecimal
- 6 Composite
- 7 ASCII
- 8 Plotting
- 9 Display

10. Systems Analysis

- 0 Unclassified
- 1 Network Design
- 2 File and Core Requirement
- 3 System Design
- 4 Configuration

11. Simulation of Computers and Components

- 0 Unclassified
- 1 Computers
- 2 Peripheral Equipment
- 3 System Component or Feature
- 4 Pseudo-Computer

12. Conversion of Programs and Data

- 0 Unclassified
- 1 Data Conversion
- 2 Computer Language Translators

*These category (classification) codes have been adopted directly from those established by JUG (Joint User Group)

September 1972

13. Statistical

0 Unclassified
1 Descriptive
2 Univariant and Multivariant Parametric
3 Non-Parametric
4 Time Series and Auto Correlation
5 Probability Distribution Sampling and Random Number Generators
6 Correlation and Regression Analysis
7 Analysis of Variance and Covariance
8 Sequential Analysis
9 Discriminant Analysis

15. Management Science/Operations Research

0 Unclassified
1 Simulations
2 Linear Programming
3 Non-Linear Programming
4 Scheduling/Critical Path/PERT/LESS
5 Games, Game-like Models and Game Theory
6 General Problem Solvers
7 Inventory Control

16. Engineering

0 Unclassified
1 Aeronautical
2 Civil
3 Chemical
4 Electrical
5 Mechanical and Hydraulic
6 Petroleum
7 Nuclear
8 General
9 Simulation

17. Sciences and Mathematics

0 Unclassified
1 General
2 Nuclear Physics
3 Chemistry
4 Geology, Oceanography, Oceanology and Geophysics
5 Biology
6 Social and Behavior
7 Astronomy and Celestial Navigation
8 Simulation
9 Pure Mathematics

18. Nuclear Codes

0 Unclassified

19. Financial

0 Unclassified
1 Inverting and Borrowing
2 Capital Stock
3 Taxes
4 Cash Custody and Forecasting
5 General Accounting
6 Auditing
7 Banking Operations

20. Cost Accounting

0 Unclassified
1 Material Only
2 Labor Only
3 Work in Progress

21. Payroll and Benefits

0 Unclassified
1 Payroll
2 Employee Benefits
3 Profit Sharing
4 Retirement
5 Insurance
6 Credit Union

22. Personnel

0 Unclassified
1 Recruiting and Hiring
2 Inventorying Employees
3 Training
4 Performance Review
5 Administering Wages and Salaries

23. Manufacturing

0 Unclassified
1 Scheduling/Loading
2 Job Reporting
3 Bill of Materials Processors
4 Numerical Control
5 Control Systems

24. Quality Assurance/Reliability

0 Unclassified
1 Testing
2 Performance Analysis

25. Inventory

0 Unclassified
1 Stocking and Issuing
2 Inventory Analysis
3 Equipment and Tool Inventory and Maintenance

26. Purchasing

0 Unclassified
1 Preparing Purchase Orders
2 Matching Invoices
3 Accounts Payable
4 Purchase Analysis

27. Marketing

0 Unclassified
1 Sales and Billings Forecasting
2 Promotion and Advertising
3 Bid or Request Analysis
4 Distribution or Territory Analysis

28. Sales Entered and Billed

0 Unclassified
1 Order Entry and Scheduling
2 Invoicing
3 Accounts Receivable
4 Sales and Billing Analysis
5 Backlog Reporting

29. General Business Services

0 Unclassified
1 Records Retention
2 Forms Management
3 Transportation
4 Printing and Reproduction

30. Demonstrations and Games

0 Unclassified
1 Display
2 Participation

40. Arithmetic Routines

0 Unclassified
1 Real Numbers
2 Complex Numbers
3 Decimal
4 Floating Point

41. Elementary Functions

0 Unclassified
1 Trigonometric
2 Hyperbolic
3 Exponential and Logarithmic
4 Roots and Powers
5 Geometry
6 Logical and Rounded

42. Polynomials and Special Functions

0 Unclassified
1 Evaluation of Polynomials
2 Roots of Polynomials
3 Evaluation of Special Functions
4 Simultaneous Non-Linear Algebraic Equations
5 Simultaneous Transcendental Equations

43. Operations on Functions and Solutions of Differential Equations

0 Unclassified
1 Numerical Integrations
2 Numerical Solutions of Ordinary Differential Equations
3 Numerical Solutions of Partial Differential Equations
4 Numerical Differentiation

44. Interpolation and Approximations

0 Unclassified
1 Table Look-up and Interpolation
2 Curve Fitting
3 Smoothing

45. Operations on Matrices, Vectors and Simultaneous Linear Equations

0 Unclassified
1 Matrix Operations
2 Eigenvalues and Eigenvectors
3 Determinates
4 Simultaneous Linear Equations
5 Vector Analysis

50. Insurance

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2 Fire
3 Pension and Welfare

61. Education

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1 Demonstrations
2 Problem Solving
3 Record Keeping

62. Literary Data Processing

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1 General
2 Language and Literature
3 Linguistics
4 Language Translation
5 Concordances
6 Content Analysis
7 Text Editing
8 Bibliographic Analysis
9 Text Manipulation

63. Humanities

0 Unclassified
1 General
2 Music
3 History
4 Art

71. Hybrid Computing

0 Unclassified
1 Analog/Digital, Digital/Analog Conversion
2 Real Time Computing
3 Simulation

72. Time Sharing

0 Unclassified

99. Miscellaneous

0 Unclassified

DECUS PROGRAM LIBRARY
PDP-8 NUMERICAL INDEX
VOLUME II

No.	TITLE	MEDIA/PRICE CODES
8-600c	EXPIP (Extensions PIP)	A01, H12, W00
8-601	OASIS	A01, F02, W00
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2	D01, G08
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program	D01, F02, G06
8-604	'GET' Command for the Disk/DECtape Monitor System	A01, F02, G02, W00
8-605	ADUMP8	D01, F02, G02
8-606b	PIP11	D01, G08
8-607	CALCU1	D01, F02, G02, H12
8-608	FUTIL - OS/8 File Utility	A01, H12, W00 ┐ Same DECtape; Includes FOCAL8-269
8-609	OCOMP - Octal Compare and Dump	┘
8-610	INVENT-8	A01, H12, W00
8-611	SLED - Source and Listing Editor	D01, F02, G02
8-612	ELAN - Elementary Linguistic Analysis	A01, B07, F02, G06
8-613	Interconversion Between A/D Floating Point and D/A Formats	D01, F02, G02
8-614	Clock Calibration	D01, F02, G06
8-615	EAE Multiplication for 8K FORTRAN	D01, F02, G02
8-616	Octal Character Equivalent	D01, F02, G02
8-617	V. A. PKS.-1 and V. A. PKS.-2 Real Time G. C. Data Integrator and G. C. Data Manipulator	A01, F06, G08, B07
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control	D01, G06
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System	D01, G06
8-620	The PHA-8 Data Acquisition System	A01, W00
8-620A	SINGS - Single Parameter, Single Precision 1024 Channel, PHA Data Acquisition	A01, B07, F02, G06
8-620B	SINGDP - Single Parameter, Double Precision 1024 Channel, PHA Data Acquisition and Display	A01, B07, F02, G06
8-620C	PK8L - 1024 Channel Off-Line Peak Location and Listing	A01, B07, F02, G06

No.	TITLE	MEDIA/PRICE CODES	
8-620D	SING8K - Single Parameter, Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display	A01, B07, F02, G06	
8-620E	PK8K - 4096 Channel Off-Line Peak Location and Listing	A01, B07, F02, G06	
8-621	Gray Code Conversion Package	A01, G02, W00	
8-622	KV8/I - VTØ1 Device Handler	D01, G06	
8-623	PAGER	D01, F02, G02	
8-624	DUMP and LOAD, TSS/8	A01, F02, G08, W00	
8-625	Floating Integer Function for use with 8K FORTRAN	D01, G02	
8-626	Automated Electrooculography	D01, F02, G02	
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format	D01, F02	
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)	A01, B08, H12	
8-629	Graphing Subroutines for 8K FORTRAN Program	D01, F02, G02	
8-630	Pulmonary Function Laboratory Program	A01, W00	
8-630A	(Spirometry Only)	F02, W00	
8-630B	8K Paper Tape System	F06, W00	
8-630C	(For non-ROM systems request binary paper tape loader in addition to DTA)	F02, H12	
8-630D	8K TC08/TU56	H12, W00	
8-630E	(Contains binaries and sources for 4K and 8K paper tape systems)	H12, W00	
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine	A01, H12, W00	Same DECtape (obj,src)
8-632	RWDF32	A01, H12, W00	
8-633	MAC8, 8K MACRO ASSEMBLER	A01, H12, W00	
8-634	MOVE	A01, H12, W00	
8-635	PAL12D	A01, H12, W00	
8-636	BEST - Binary to Symbolic Traductor	A01, F02	
8-637	A Flexible Data Buffer Display Routine for LAB-8 Systems	D01, G02	
8-638	GEOMAS	D01, G02	
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8-640	OS/8 EDIT PLUS	A01, B07, F02	
8-641	OS/8 FORMAT	D01, G02	

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8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)	D01, F02
8-643	LIFE	D01, G02
8-644	MINMON - TD8E DECtape Minimonitor	D01, F02, G02
8-645	Interfacing the PDP-8 to the Printec-100 Line Printer	D01, F02
8-646	DECsystem-8	A01, H12, J11, W00
8-647	FULMIX - Complete Permutation Program	A01, F02, W00
8-648	LOGMIN - Logic Minimization Program	A01, F02, W00
8-649	QPIP - OS/8 Directory Editing Program	A01, G06, W00
8-650	AMIPED- Automated Medical Interview With Pediatric Data Files	D01, G06
8-651	SOLMT (Sort Overlay Listings Using Magnetic Tape)	A01, B07, H12
8-652	Regression Analysis Package	D01, F06 (Test Tapes Included)
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O	A01, F06, W00
8-654	Cabrillo Test Grader	D01, F02
8-655	Patches to CINET-BASIC (DECUS NO. 8-159)	D01, F02
8-656	SELFDRILL - The Sloan Selfdrill Program	A01, B12, F02, G10
8-657A	INPUT, A Neurophysiological Data Collecting Program	A01, B08, F02, G12
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers	A01, B05, F02, G06
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8-658	Extended Double Precision Interpretive Package	D01, F02, G06
8-659	VT05	D01, H12
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8-661	LESQ, General Non-Linear Least Squares	A01, H12, W00
8-662	UNDEFSYBLIST - Undefined Symbol List	D01, F02, G02
8-663	REPROD - Read, Punch and Verify Product	D01, F02, G02
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements	D01, G02
8-665	INTVAL - A Subroutine to Measure Inter-Event Intervals	D01, G02
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals	D01, G02

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8-667	LABLDP - A TSS/8 Tape Labeling Program	D01, F02, G02
8-668	RAW - A Reverse Assembler of Windsor	A01, B07, F02, G06
8-669	BIOLSD - Antibiotic Assay Using Latin Square Design	A01, B07, F06, G06
8-670	Basic Plotting Package for OS/8 FORTRAN IV	D01, F06, G06, H12
8-671	Restoring Symbolprint	D01
8-672	XCBL and XBIN Loader	D01, F02, G02
8-673	Random Number Generators for Use With FORTRAN or SABR Programs	D01, F02
8-674	External - Or RC - Clock (AXØ8) Calibration	D01, F02, G02
8-675	INDUMP - Input Dump	D01, F02, G02
8-676	MOVE DELETE	D01, F02, G02
8-677	STAR PIP	A01, H12, W00 *
8-678	Routine to Expand and Modify the DEC Floating-Point Package	D01, G06
8-679	MAPPER	D01, G02
8-680	WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions	A01, G02, W00
8-681	CASE - Carleton Symbolic Editor	A01, B07, F02, G08
8-682	SCPSYS (Scope System)	A01, H12, W00
8-683	BNLOAD, TSS/8 Binary Loader	D01, F02, G02
8-684	Injection Patcher - IJPA	A01, F02, G06, W00
8-685	DPSQRT - Double Precision Square Root for PDP-8	D01, G02
8-686	Bowling League Results, Standings and Averages	A01, G06, W00
8-687	GOLF	A01, G06, W00
8-688	FOOTBALL	A01, G06, W00
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program	D01, G02
8-690	RANDU	D01, F02, G02
8-691	ACCK Timeshare Accounting System	A01, W00 (DECtape available from author)
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System	A01, H12, W00
8-693	A Programmed Learning Course in Boolean Algebra	A01, G06, W00
8-694	Teletype Line Printer Emulator Handler for OS/8	D01, G02

* Same DECtape as 8-445, 8-497A, 8-530, 8-531A&B

No.	TITLE	MEDIA/PRICE CODES	
8-695	Real Time Display Processor for a KV8 Graphic System and KW8 Clock	D01, F02, G06	
8-696	DECTYP, One-Word Signed Decimal Print	D01, G02	
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - Edusystem50)	D01, F02, G02	
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010	D01, F02, G02	
8-699	MPS External Event Common Routines	D01, G02	
8-700	JET AMBUSH	D01, F02	
8-701	TEXT: Readable Punch Handler for OS/8	D01, F02, G02	
8-702	COGO-8	A01, B12, H23	
8-703	AMORT: Incremental Amortization Schedule	D01, H12	Same DECtape
8-704	ANOV1: Analysis of Variance, Unequal N	D01, H12	
8-705	ARNORM: Area Under Normal Curve	D01, H12	
8-706	BITSET	D01, H12	
8-707	CRSTAB: Cross Tabulation Program	D01, H12	
8-708	EMLP: Emory Linear Programming Package	D01, H12	
8-709	FINCA: A Computer Program for Financial Statement Analysis	D01, H12	
8-710	MULTS: Multiple Regression Program	D01, H12	
8-711	Microprocessor Cross Reference Program for OS/8	A01, F02, W00	
8-712	IRSPEC: Calculation "On-Line" of Far Infrared Spectra by Fourier Transform	A01, F02, W00 *	
8-713	FORTRAN Plotting Subroutines	A01, H12, W00	
8-714	PDPLST: PDP-8 IBM 360/370 Cross Listing Program	D01, R12	
8-715	F4 GRAPHICS	D01, H12, J11	
8-716	Exponential Functions	D01, F02, G06	
8-717	F4EAE - EAE OVERLAY FOR FRTS	D01, F02, G02	
8-718	NSD - Nominal Standard Dose	D01, H12	
8-719	OS/8 Software for a TC58 Magtape Control	A01, B07, F02, G06, H12	
8-720	LSTDMP: Binary Tape Dump/Lister	D01, F02, G02	
8-721	LISP-8K	A01, F02, W00	
8-722	Mini-Copy	D01	
8-723	Function Comp.FT	D01, G02	
8-724	Computer Catalog System	D01, G06	

* DECtape available from author; Write-up in French

No.	TITLE	MEDIA/PRICE CODES
8-725	The Pipe Stress Problem on a PDP-8/F	A01, B07, F02
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer	D01, F02, G02
8-727	Disassembler	D01, F02
8-728	MEND	D01, F02
8-729	DS340 DEMO Package	A01, W00 *
8-730	CORVU: A Display and Teletype Input/ Output Program	D01, F02, G06
8-731	MEMO IV	A01, H12, W00
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC	D01, G02
8-733A	PDP-8/E RJE System (IBM 2780 Emulator)	A01, B07, F06, H12
8-733B	Software Support Manual for PDP-8/E RJE System	A05, W00
8-734	Microprocessor Language Assembler for OS/8	A01, F02, W00
8-735	DSP8; Diagnostic Support Package for the PDP-8	A01, B07, F02, G02, H12
8-736	Paper Tape Reader-Printer	D01, F02, G06
8-737A	Four Word Floating Point Package for MPS	A01, F02, W00
8-737B	Four Word Floating Point Functions for MPS	A01, F02, W00
8-737C	Rudimentary Calculator for MPS Four Word Floating Point Routines	D01, F02
8-738	The Business Management Laboratory	A01, H16, W00
8-739	COPY.PA	A01, F02, G02, W00
8-740	Theorem Prover for the Propositional Calculus	A01, G02, W00
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape	D01, H12
8-742	CLOCK - A Real-Time Clock/Calendar Routine	D01, F02, G02
8-743a	FILFIX - TSS/8 File Structure Repairing and Restructuring Program	A01, B07, F02
8-744	TSTCDR - TSS/8 Card Reader Diagnostic	D01, F02
8-745	LEP, Linear, Exponential and Power Function Curve Fit	D01, H12
8-746	Device Handler for Tektronix 611 Storage Scope	A01, G02, W00
8-747	STAGE2 MACRO Processor	A02, B12, F06, G08
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter	D01, G02
8-749	UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined Functions for OS/8 BASIC	A01, B07, G06

* Tapes available from DIGITAL Business Products

No.	TITLE	MEDIA/PRICE CODES	
8-750	Paper Tape Display	D01, F02	
8-751	FORTRAN IV for OS/8 FORTRAN II Users	A01, W00	
8-752	MIG8E2 - Monitor of Interruptions Which Are Generated by the PDP-8/E Peripherals	A01, H12, W00	
8-753	OS/8 System Output Handlers	A01, B05, F02, H12	Same DEC-tape (obj, src, doc)
8-754	NUMBER and REDATE - OS/8 File Utility Programs	A01, B05, F02, H12	
8-755	OCTYPE - Octal Memory Dump	D01, F02	
8-756	ASCON - ASCII File Converter	A01, F02, J11, W00	
8-757	OS/8 Utility Package	A01, H12, W00	
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E	D01, F02, G02	
8-759	USLIBA - FORTRAN II Subroutines for Binary Data Transfer	D01, F02, G06	
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel	A01, B07, F02, G08	
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device	D01, F02, G06	
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal	D01, F02, G06	
8-763	KL8TST - KL8/E, KL8/J Diagnostic	D01, G02	
8-764	LIST	D01, F02, G06	
8-765	DUMPOS - Dumps OS/8 ASCII Files	D01, F02, G02	
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator	D01, F02, G02	
8-767	Critical Path Method of Scheduling	D01, F06	
8-768	EDAS - Editing and Assembling System	D01, F02, G02	
8-769	SELFDR - The Selfdrill Program, 8K Version	A01, B12, H12	
8-770	MOSS - 4K TD8E DECtape System	A01, H12, W00	
8-771	PRGSCH - TSS/8 Program Searcher	D01, G02	
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems	D01, H12	
8-773	Graphics Package for the Tektronix 4010 Under OS/8	A01, H12, W00	
8-774	Simple ASCII Editor and Tape Reproducer	D01, F02, G02	
8-775	COPIER	A01, G02, W00	
8-776	BNPF Format Paper Tape Loader for MPS	D01	

No.	TITLE	MEDIA/PRICE CODES
8-777	PDP8ASM, Version 3.01	A01
8-778	PFCF - Polynomial Function Curve Fitting	D01, H12
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape	D01, H12
8-780	SPLIT and SPLICE	A01, B07, F02
8-781	DOCRLN - A Subroutine to Calculate Polarity-Quantized Autocorrelograms	D01, F02, G02
8-782	DEVHND - Device Handler for Storage Scope Using AXØ8 (LAB-8) as Controller	D01
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III	D01
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8-786	TSS/8 FORMAT	D01, H12
8-787	LISZ - An Extended ISZ Instruction for the PDP-8/L	A01, W00
8-788	Using the RAR RAL Micro-Instruction as an Auxiliary Command	A01, W00
8-789	RKCOPY	A01, F02, G06, W00
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System	D01, F02
8-791	DELAY	D01, F02, G02
8-792	PROVE-8, V.03	A01, B07, F02
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV	D01, G02
8-794	IFAC - A FORTRAN Program for Parameter Estimation	D01
8-795	RINROT - A Roll-in, Roll-out Program	D01, F02, G02
8-796	Five Word Floating Point Package for PDP-8	A01, B07, F02, G06
8-797	LSPCF	A01, B07, F02, G06
8-798	OS/8 to RSTS Interface	D01, G06
8-799	Dose Calculation of Irregular Fields	D01, H12
8-800	Heat Loss Calculation	D01, F02
8-801	MORSE - Morse Code Coder and Decoder	A01, B07, F02, G06
8-802	SSP: Scientific Subroutine Package	H25, W00, Y00
8-803	FOLMAT	D01, B05, F02, G02, H12

No.	TITLE	MEDIA/PRICE CODES
8-804	MUSIC: PDP-8 Music Playing Program	A01, F02, H12, K14, W00
8-804.1	The Entertainer	A01, G02, W00
8-804.2	Love Will Keep Us Together, others	A01, G02, W00
8-804.3	Minute Waltz	A01, G02, W00
8-804.4	Bach, Inventions	A01, G02, W00
8-805	PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and Punch	D01, G02
8-806	SAC8: Simulation of An Analogue Computer	D01, F02, G02
8-807	UTILITY Routine and Patches for the FORTRAN Compiler	D01, F02, G02
8-808	Probability Density Functions of Analogue Signals with the LAB-8 System	A01, F02, W00
8-809	FFT or IFFT of an Analogue Signal with the LAB-8 System	A01, B12, F02
8-810	PING: Ping-Pong Game on Display	D01, F02, G06
8-811	DYNOD: Dynamic Octal Debugger	D01, F02, G02
8-812	CASINO: Sykes Cassette Input/Output	D01, F02, G02
8-813	DIGFIL: Recursive Digital Filter	D01, F02, G06
8-814	PROCES: An Image Processing Program for the PDP-8/E	A01, B12, H12
8-815	BINPUN: OS/8 Binary Punch from Core Image Files	D01, F02, G02
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter	D01, G02
8-817	LABCOL I: Laboratory Control and Automation Language	A01, F02, W00

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-600b	$ NC	$	$	$	$ 8.	$ 20.	$	$	$	$	1 DTA (src)
8-601	NC	2.									
8-602A	1.*		12.	NC							*NC with tapes
8-602B	1.*		12.	NC							*NC with tapes
8-603	NC	2.	8.	NC							
8-604	NC	2.	2.								
8-605	NC	2.	2.	NC							
8-606b	NC		12.	NC							
8-607	NC	2.	2.	NC	8.	20.					Paper Tape OR 1 DTA
8-608	NC				8.	20.					Tape includes 8-608, 8-609
8-609	NC				8.	20.					& FOCAL8-269
8-610	NC				8.	20.					1 DTA (obj,src)
8-611a	NC	2.	2.	NC							
8-612	NC	2.	8.	10.							
8-613	NC	2.	2.	NC							
8-614	NC	2.	8.	NC							
8-615	NC	2.	2.	NC							
8-616	NC	2.	2.	NC							
8-617	1.*	8.	12.	10.							*NC with tapes
8-618	NC		8.	NC							
8-619	NC		8.	NC							
8-620	NC			*Note							*Listings as quoted below
8-620A	NC	2.	8.	10.							
8-620B	NC	2.	8.	10.							
8-620C	NC	2.	8.	10.							
8-620D	NC	2.	8.	10.							
8-620E	NC	2.	8.	10.							
8-621	NC		2.								
8-622	NC		8.	NC							
8-623	NC	2.	2.	NC							
8-624	NC	2.	12.								
8-625	NC		2.	NC							
8-626	NC	2.	2.	NC							
8-627	NC	2.		NC							
8-628	NC			10.	8.	20.					1 DTA (obj,src)
8-629a	NC	2.	2.	NC							
8-630	2.*										

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-630A	$2.*	$2.	$	$	$	$	$	$	$	$	*NC with tapes
8-630B	Same	8.									
8-630C		2.			8.	20.					1 DTA (obj,src)
8-630D	Write-				8.	20.					1 DTA (obj,src)
8-630E	up				8.	20.					1 DTA (obj,src)
8-631	NC				8.	20.					Same DTA (1) (obj,src)
8-632	NC				8.	20.					
8-633	NC				8.	20.					
8-634	NC				8.	20.					
8-635	NC				8.	20.					
8-636	NC	2.									
8-637	NC		2.	NC							
8-638	NC		2.	NC							
8-639	NC	2.		10.							
8-640	NC	2.		10.							
8-641	NC		2.	NC							
8-642	NC	2.		NC							
8-643	NC		2.	NC							
8-644	NC	2.	2.	NC							
8-645	NC	2.		NC							
8-646	NC				8.	20.	8.	18.			1 DTA OR 1 LTA
8-647	NC	2.									
8-648	NC	2.									
8-649	NC		8.								
8-650	NC		8.	NC							
8-651	NC			10.	8.	20.					1 DTA (obj,src, listing)
8-652	1.*	8.		NC							Test tapes included *NC with tapes
8-653	NC	8.									
8-654	NC	2.		NC							
8-655	NC	2.		NC							
8-656	NC	2.	16.	20.							
8-657A	NC	2.	12.	10.							
8-657B	NC	2.	8.	5.							
8-657C	NC	2.	8.	5.							
8-658	NC	2.	8.	NC							
8-659	NC			NC	8.	20.					1 DTA with 8-600b (src)
8-660	NC				8.	20.					1 DTA (src, doc, test data)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

May 1975

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-661	$ NC	$	$	$	$ 8.	$ 20.	$	$	$	$	1 DTA (src,doc)
8-662	NC	2.	2.	NC							
8-663	NC	2.	2.	NC							
8-664	NC		2.	NC							
8-665	NC		2.	NC							
8-666	NC		2.	NC							
8-667	NC	2.	2.	NC							
8-668	NC	2.	8.	10.							
8-669	NC	8.	8.	10.							
8-670	NC	8.	8.	NC	8.	20.					1 DTA
8-671	NC			NC							
8-672	NC	2.	2.	NC							
8-673	NC	2.		NC							
8-674	NC	2.	2.	NC							
8-675	NC	2.	2.	NC							
8-676	NC	2.	2.	NC							
8-677	NC				8.	20.					1 DTA with 8-497
8-678	NC		8.	NC							
8-679	NC		2.	NC							
8-680	NC		2.								
8-681	NC	2.	12.	10.							
8-682	NC				8.	20.					1 DTA (obj,src)
8-683	NC	2.	2.	NC							
8-684	NC	2.	8.								
8-685	NC		2.	NC							
8-686	NC		8.								
8-687	NC		8.								
8-688	NC		8.								
8-689	NC		2.	NC							
8-690	NC	2.	2.	NC							
8-691	NC										DTA available from author
8-692	NC				8.	20.					1 DTA (obj,src)
8-693	NC		8.								
8-694	NC		2.	NC							
8-695	NC	2.	8.	NC							
8-696	NC		2.	NC							
8-697	NC	2.	2.	NC							

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

May 1975

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-698	$ NC	$ 2.	$ 2.	$ NC	$	$	$ 8.	$ 18.	$	$	1 LTA for OS/12 users
8-699	NC		2.	NC							
8-700	NC	2.		NC							
8-701	NC	2.	2.	NC							
8-702	2.*			20.	32.	80.					4 DTA *NC with tapes
8-703	NC			NC	8.	20.					Same DTA (1) contains 8-703-710
8-704	NC			NC	8.	20.					
8-705	NC			NC	8.	20.					
8-706	NC			NC	8.	20.					
8-707	NC			NC	8.	20.					
8-708	NC			NC	8.	20.					
8-709	NC			NC	8.	20.					
8-710	NC			NC	8.	20.					
8-711	NC	2.									
8-712	NC	2.									Write-up is in French
8-713	NC				8.	20.					1 DTA (obj,src)
8-714	NC			NC							Card Deck - $20
8-715	NC			NC	8.	20.	8.	18.			1 DTA, 1 LTA
8-716	NC	2.	8.	NC							
8-717	NC	2.	2.	NC							
8-718	NC			NC	8.	20.					1 DTA
8-719	NC	2.	8.	10.	8.	20.					1 DTA
8-720	NC	2.	2.	NC							
8-721	NC	2.									
8-722	NC			NC							
8-723	NC		2.	NC							
8-724	NC		8.	NC							
8-725	NC	2.		10.							
8-726	NC	2.	2.	NC							
8-727	NC	2.		NC							
8-728	NC	2.		NC							
8-729	1.										Tapes available from Bus. Products

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

May 1975

DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-734	$ 1.	$ 2.	$	$	$	$	$	$	$	$	
8-735	1.	2.	2.	10.	8.	20.					1 DTA (obj,src,doc)
8-736	1.	2.	8.	Inc.							
8-737A	1.	2.									
8-737B	1.	2.									
8-737C	1.	2.		Inc.							
8-738	1.				16.	40.					2 DTA
8-739	1.	2.	2.								
8-740	1.		2.								
8-741	1.			Inc.	8.	20.					1 DTA (obj,src)
8-742	1.	2.	2.	Inc.							
8-743a	1.	2.		10.							
8-744	1.	2.		Inc.							
8-745	1.			Inc.	8.	20.					1 DTA
8-746	1.		2.								
8-747	2.	8.	12.	25.							
8-748	1.		2.	Inc.							
8-749	1.		8.	10.							
8-750	1.	2.		Inc.							
8-751	1.										
8-752	1.				8.	20.					1 DTA (obj,src)
8-753	1.	2.		5.	8.	20.					Same DTA (1) (obj,src,doc)
8-754	1.	2.		5.	8.	20.					
8-755	1.	2.		Inc.							
8-756	1.	2.					8.	18.			1 LTA (obj,src,write-up,listing,SV)
8-757	1.				8.	20.					1 DTA (obj,src)
8-758	1.	2.	2.	Inc.							
8-759	1.	2.	8.	Inc.							
8-760	1.	2.	12.	10.							
8-761	1.	2.	8.	Inc.							
8-762	1.	2.	8.	Inc.							
8-763	1.		2.	Inc.							
8-764	1.	2.	8.	Inc.							
8-765	1.	2.	2.	Inc.							
8-766	1.	2.	2.	Inc.							
8-767	1.	8.		Inc.							
8-768	1.	2.	2.	Inc.							

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-769	$ 1.	$	$	$20.	$ 8.	$ 20.	$	$	$	$	1 DTA (obj,src)
8-770	1.				8.	20.					1 DTA (obj,src)
8-771	1.		2.	Inc.							
8-772	1.			Inc.	8.	20.					1 DTA (src)
8-773	1.				8.	20.					1 DTA (obj,src,doc)
8-774	1.	2.	2.	Inc.							
8-775	1.		2.								
8-776	1.			Inc.							
8-777	2.								25.	40.	1 MTA (600')
8-778	1.			Inc.	8.	20.					1 DTA
8-779	1.			Inc.	8.	20.					1 DTA (obj,src,list)
8-780	1.	2.		10.							
8-781	1.	2.	2.	Inc.							
8-782	1.			Inc.							
8-783	1.			Inc.							
8-784	1.			Inc.	8.	20.					1 DTA (sav,src)
8-785	1.			Inc.	8.	20.					1 DTA (src,sav)
8-786	1.			Inc.	8.	20.					1 DTA (src,sav)
8-787	1.										
8-788	1.										
8-789	1.	2.	8.								
8-790	1.	2.		Inc.							
8-791	1.	2.	2.	Inc.							
8-792	1.	2.		10.							
8-793	1.		2.	Inc.							
8-794	1.			Inc.							
8-795	1.	2.	2.	Inc.							
8-796	1.	2.	8.	10.							
8-797	1.	2.	8.	10.							
8-798	1.		8.	Inc.							
8-799	1.			Inc.	8.	20.					
8-800	1.	2.		Inc.							
8-801	1.	2.	8.	10.							
8-802					40.	100.					Tapes only, 5 DTA
8-803	1.	2.	2.	5.	8.	20.					
8-804	1.	2.			8.	20.					2 floppy disks $40.
8-804.1			2.								The Entertainer

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
		$	$	$	$	$	$	$	$	$	
8-804.2			2.								Love Will Keep Us Together, others
8-804.3			2.								Minute Waltz
8-804.4			2.								Bach, Inventions
8-805	1.		2.	Inc.							
8-806	1.	2.	2.	Inc.							
8-807	1.	2.	2.	Inc.							
8-808	1.	2.									
8-809	1.	2.		20.							
8-810	1.	2.	8.	Inc.							
8-811	1.	2.	2.	Inc.							
8-812	1.	2.	2.	Inc.							
8-813	1.	2.	8.	Inc.							
8-814	1.			20.	8.	20					
8-815	1.	2.	2.	Inc.							
8-816	1.		2.	Inc.							
8-817	1.	2.									
8-818	1.			Inc.							

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GENERAL INFORMATION

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When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

A complete set of all current PDP-8 write-ups (includes Vol. 1 and Vol. 2) is available for a service charge of $75.00.

All user DECtapes must be certified. DECUS cannot/ will not copy programs onto uncertified tapes.

DECUS NO. 8-600b

EXPIP - EXTENSION PIP, Version 5B

Lars Palmer, A B Hassle, Molndal, Sweden

EXPIP is a program that will do file transfers in a more versatile way than PIP. Its main functions are:

a) File transfers are based on extension not file names, but a /S option (selective) makes it possible to transfer any files.

b) It contains a delete function that allows any files to be deleted even 'impossible ones'.

c) It contains a function that much resembles the 'squash using' of DECSYSTEM 8 as described in the OS/8 news letter.

d) It also contains a function to access material from a device with ruined directory blocks (it will allow you to make a file out of any specified blocks).

The file EXPIP.CO contains further information.

Minimum Hardware: 8K PDP-8 with PS/8-OS/8
Source Language: PAL-8

DECUS NO. 8-601

OASIS

Robert Cronin, Belmont Hill School, Belmont, Massachusetts

OASIS is yet another one of the many programs that has PAL III coupled with EDITOR in an 8K machine. It too reads the text image from core, rather than from paper tape. Yet, there are several differences over other versions:

1. Tape punched in XCBL format (See DECUS NO. 8-26C)
2. Virtually no operator intervention at the console is required.
3. It contains a built in "operating system" that performs many minor functions that one does not normally want to bother about when testing out sections of a large program.
4. A provision for immediate testing of small sections of a program.
5. A pseudo CONTROL/C feature is now built in that allows the user to terminate virtually all output without intervention at the console.
6. The system is loaded with RIM only.

Minimum Hardware: 8K PDP-8, ASR33

DECUS NO. 8-602

The PDP-8 Cookbook, Volume 1

Editor: Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

The PDP-8 cookbook is a collection of subroutines at the assembly level for the purpose of instant use.

Minimum Hardware: PDP-8 family
Source Language: PAL

DECUS NO. 8-602B

PDP-8 Cookbook, Volume 2

Editor: Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

This volume adds 44 new subroutines to the gradually increasing PDP-8 subroutine library.

Source Language: PAL III, PAL-D, PAL-8

DECUS NO. 8-603

PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program

Priv. Doz. Dr. med. Juergen B. Vieth, Universitaets-Nervenklinik, Erlangen, W. Germany

This is a patch for the DEC-LB-U4OB Post-Stimulus-Time-Histogram-Program. It allows to write or read data on DEC-tape unit 3 while the program is called from the system device (unit 0). Questions about the functions "write" or "read" as well as the desired file number will be asked on the display. During function "write" all TTY commands of the main program are active. During "read" function commands to reask parameters or to clear the data buffer are not available.

Minimum Hardware: PDP-8/E with 4K memory, ASR33 teletype, AD8-EA 10 bit A/D converter, AM8-EA 8 channel multiplexer, VC8-E Point plot display control with display oscilloscope VR03A or VR 14 or RM 503, DK8-EP Programmable real time clock, KE8-E Extended arithmetic element, TC08 DECtape control, TU 56 Dual DECtape transport
Other Programs Needed: Main program (DEC-LB-U4OB)
Storage Requirement: Core locations: 0-4177, 7420-7577 (For further information: DEC-LB-U4OB-D); this patch runs in the data area: 4200-6177
Restrictions: The name of the program must be: PST
Source Language: PAL-D

DECUS NO. 8-604

'GET' Command for the Disk/DECtape Monitor System

Craig B. Phyfe, The Hill School, Pottstown, Pennsylvania

This is a program developed for use with the Disk Monitor System. It has been used successfully on the 'AF' version of the monitor, but it should run on the '8E' version as well. The program is an extension of the Disk Monitor System, allowing the user to read a specified file from the disk into core without executing it. It is patterned after the OS/8 system 'GET' command, with the restriction that this program will only manipulate programs saved on the system device, whether it be DF/DS-32 disk, RF/RS-08 disk, or DECtape. This program

DECUS NO. 8-604 (Continued)

is useful when the user wants to toggle a patch into a system program before executing that program.

Minimum Hardware:	4K PDP-8, DF32 Disk or RF08 Disk or TC01 DECtape
Other Programs Needed:	Disk Monitor System (DEC-08-SBAF-PB)
Restrictions:	Actual system will recognize both Disk and DECtape but GETSYS will only operate on the system device.
Source Language:	PAL-D

DECUS NO. 8-605

ADUMP8

Bruno Nicoletta and G. Franco Ruffini, Digital Electronic Automation, Moncalieri, Italy

This program provides a means of punching information contained in selected blocks of any core memory field, as binary coded paper tape using the high speed or TTY punch.

Minimum Hardware:	4K PDP-8, TTY or high speed punch
Source Language:	PAL III

DECUS NO. 8-606

PIP11

Steven Williamson, Carleton College, Northfield, Minnesota

PIP11 allows a PS/8 user to read and write on DECtapes formatted and initialized for either DOS or RSTS, the two most commonly used systems on the PDP-11. Additional options allowing the output of data from an 11 DECtape to a DECtape that can be used by TSS/8 BASIC are also available.

Minimum Hardware:	8K PDP-8, EAE, 1 DECtape drive (2 preferable)
Other Programs Needed:	PS/8 system
Source Language:	PAL-8

DECUS NO. 8-607

CALCU1

J. V. Hopson, Bureau of Customs, 2100 K Street N. W., Washington, D. C.

Makes the PDP-8 perform like a printing calculator, with addition, subtraction, multiplication, division, and exponentiation. Prints out subtotals and totals on command. Recognizes control/C for return to monitor. Utilizes one of the DEC floating point packages (EAE--if so equipped, NON-EAE, or 27-BIT). Introductory dialog gives essential operating instructions.

Minimum Hardware:	PDP-8, TTY
Other Programs Needed:	Floating Point Package (EAE, NON-EAE or 27- BIT)
Source Language:	PAL-8

DECUS NO. 8-608

FUTIL - OS/8 File Utility

Jim Crapuchettes, Department of Anesthesis, Stanford Medical Center, and Frelan Associates, Menlo Park, California

This program allows examination and modification of OS/8 (PS/8) mass storage devices from the teletype. A wide variety of commands allows this to occur along with searching, file look-up, and 24-bit integer expression evaluation.

Minimum Hardware:	OS/8 Configuration, 8K
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-609

OCOMP - Octal Compare and Dump

Dennis McGhie and Jim Crapuchettes, Frelan Associates, Menlo Park, California

An OS/8 utility program to compare or dump OS/8 files. Masking for compares and searching for dumps are included. The output file contains the contents in octal from the first input file, of all (dump) or part of the words (compare, search) from the file. This program is useful for comparing two versions of a ".SV" file.

Minimum Hardware:	OS/8 Configuration (Source file is supplied on DECtape)
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-610

INVENT-8

Charles Moeder, Digital Equipment Corporation, Maynard, Massachusetts

INVENT-8 is a series of subroutines for manipulating binary unformatted data running under the OS/8 Monitor (OS/8 FORTRAN II). It allows the user to open input and output files as well as read and write binary unformatted, fixed length records of up to 125 12-bit word per record.

Also included is a generalized sort generator for sorting these core image records.

Minimum Hardware:	OS/8 Configuration, 8K, 64K Mass storage peripheral
Other Programs Needed:	OS/8 FORTRAN
Source Language:	SABR

DECUS NO. 8-611

SLED - Source and Listing Editor

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

Programs written in condensed format (with lines separated by semicolons and extended as required) do not give neat listings, suitable for publication, when passed through the standard MACRO or PAL III assemblers. SLED secures a neat listing from the raw listing tape produced from the assembler, with one blank line before each label, except labels used to define zero constants, and two blank lines before every break in program counter sequence. Along each line, non-significant spaces are eliminated to give a nicely justified format, and the obtrusive semicolons are removed. The number of lines to a page are controlled and new pages automatically started at suitable points in the listing. Pagination and titling are automatic. The program can be used to lay out source tapes in a similar manner.

Minimum Hardware:	PDP-8, TTY, HSR and/or HSP optional
Restrictions:	Program written for non-standard high speed paper tape reader - use standard DEC reader with caution. One delay needs adjustment for computer other than 8/S
Source Language:	MACRO

DECUS NO. 8-612

ELAN - Elementary Linguistic Analysis

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

ELAN is a simple program for educational demonstrations of the use of a computer in language studies. From an input of arbitrary length it counts the occurrence of every letter, punctuation mark, and other symbol in the sample, and also can be set to count the occurrences of up to 64 nominated words, or the beginnings or endings of words, each with a maximum length of 7 characters, and to present all these counts in a convenient format at the end of the sample, together with a word length analysis and a count of the number of paragraphs in the sample. Input can be by paper tape, using either a teletype of HSR, or directly from the keyboard.

Minimum Hardware:	PDP-8, TTY, HSR optional
Restrictions:	Developed for non-standard HSR; use DEC HSR with caution
Source Language:	MACRO

DECUS NO. 8-613

Interconversion Between A/D Floating Point and D/A Formats

Brian C. Hodgkin, Ph.D., Maine Medical Center, Portland, Maine

A collection of subroutines is provided which makes possible the conversion of data in one format to either of the other two formats. Complex calculations can be performed on A/D inputted information using floating point arithmetic, with results outputted in any of the three formats. Machine language and floating point programs can be intermingled by appropriate initialization and use of the subroutines.

Minimum Hardware:	PDP-8, A/D and/or D/A converter
Other Programs Needed:	23-bit Floating Point Package (DEC-08-NFPPA-A-PB)
Restrictions:	Can be used in single field as is; can be modified for multi-field operation. A/D and D/A formats must be the same as ADØ1A and AA50
Source Language:	PAL III

DECUS NO. 8-614

Clock Calibration

Masashi Kamii, The Central Institute for Experimental Animals, Nogawa, Kowasaki, Japan

Using CRT (RM503) and X'TAL-clock in an AX08 configuration this program allows visible calibration of the RC-clock.

Minimum Hardware:	LAB 8/I (PDP-8/I and AX08 without XR, XC, XM option)
Source Language:	PAL III

DECUS NO. 8-615

EAE Multiplication for 8K FORTRAN

Donald C. Parker, Clarkson College of Technology, Potsdam, New York

This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/I or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.RL. Core space, however, has been sacrificed for this additional speed.

Other Programs Needed:	8K FORTRAN
Source Language:	SABR

DECUS NO. 8-616

Octal Character Equivalent

David Dodell and Michael Wax, Dix Hills, New York

This program will find the 8-bit ASCII code equivalent for any letter or symbol typed, with the exception of CTRL C. It will run only under the TSS/8 monitor, but can be easily converted for a stand-alone PDP-8.

Minimum Hardware:	TSS/8
Source Language:	PAL-D

DECUS NO. 8-617

V.A. PKS.-1 and V.A. PKS.-2, Real Time G. C. Data Integrator and G. C. Data Manipulator

Dr. J. B. Pearce, Ball Brothers Research Corporation, Boulder, Colorado; Dr. S. P. Levine, Veterans Administration Hospital, Denver, Colorado; P. J. R. Boyle, University of Colorado, Denver, Colorado; J. L. Naylor, Veterans Administration Hospital, Denver, Colorado

V.A. PKS.-1

GC separation and integration is accomplished by an assembly language program which makes extensive use of the floating point arithmetic interpreter. The real time portion of the program samples data from the GC detector once per second. This data is smoothed and differentiated using a weighted, odd integer smoothing routine. When the derivative exceeds an operator selected value, a "GC peak" is provisionally established. If the peak satisfies the selected minimum width criterion, the location and area of this event are either printed out immediately on the teletypewriter or stored in memory for further processing if there is evidence that the peak is incompletely resolved. When the GC data returns to within a selectable vicinity of the baseline, or five peaks is exceeded, the perpendicular drop method is used to resolve them and the results are printed out.

V.A. PKS.-2

Automatic data reduction is as important as peak area integration. Reduction of the data is accomplished using the same equipment in an off-line mode. This segment of the program accepts the paper tapes generated by the first segment, as well as additional information from the keyboard. This program also uses the floating point interpreter. The interpreter remains resident in core and only the driving segments of the program need be exchanged.

Minimum Hardware:	4K PDP-8, 189 A/D, ASR33, KW08 or R401 clock packages, Computer-compatible GC
Other Programs Needed:	Floating Point Processor (DEC-08-YQ2B-PB)
Miscellaneous:	This program has also been modified for use on the PDP-12. Information may be obtained from: Tom Jenkins, Mass. Spectrometry Laboratory, Cold Regions Research Laboratory, Hanover, N. H.
Source Language:	PAL-8

DECUS NO. 8-618

Two OS/8 Device Handlers for the 57A Magnetic Tape Control

Donald C. Uber, Lawrence Livermore Laboratory, University of California, Livermore, California

Three programs are included. MTA is a one-page file-structured OS/8 handler using the "simulated DECtape" format of DECUS NO. 8-391. TAP is a two-page non file-structured handler for ASCII files. Both require EAE and run on a 57A magtape controller with two transports. MARK is a stand-alone program for formatting MTA tapes. The write-up includes listings and describes several modifications to the 57A necessary to run the software.

Minimum Hardware:	8K PDP-8, DEC 57A Magtape Control with 1 or 2 tape units
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-619

FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System

Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of 10 subroutines for an 8K FORTRAN system (OS/8, PS/8, or paper tape) which allows any FORTRAN or SABR program to display graphical figures or text on a VTØ1 storage tube. Provision is provided for erasing the screen, turning on or off the cursor, testing the cursor flag, reading cursor coordinates, and drawing points, lines and circular arcs. Text strings may also be displayed anywhere on the screen with characters of arbitrary width, height and orientation. Any of the 64 printable ANSCII characters may be drawn. Core required is 8 pages.

Minimum Hardware:	KV8 Controller, VTØ1 Storage tube, H3Ø6 Joystick
Other Programs Needed:	SABR Assembler; Linking Loader; FORT.LIBRAR.
Source Language:	SABR

DECUS NO. 8-620

The PHA-8 Data Acquisition System

Digital Equipment Corporation Physics Marketing
Submitted by: R. J. Epler, LDP Marketing, Digital Equipment Corporation, Maynard, Massachusetts

Five programs are offered which produce a powerful system for the acquisition and analysis of nuclear physics data, made possible by the interfacing of an analog-to-digital converter (ADC) to a DEC PDP-8 family computer.

All programs will run on the PDP-8/L or 8/I. None will run on the PDP-8/S. All programs require the KA8E peripheral. Other necessary peripherals are:

NN01 Nuclear ADC Interface and Scope Control (available from DEC 's Computer Special Systems.)

DECUS NO. 8-620 (Continued)

Tektronix 503 Scope
Any Wilkinson type PHA ADC
TCØ8 DECtape if available

Source Language: PAL-1Ø and PAL-8 for all routines

Note: Only an introduction to the system is offered under this initial number. The various routines and associated documentation should be ordered by the numbers indicated below.

DECUS NO. 8-620A

SINGS - Single Parameter, Single Precision, 1024 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 1024-channel pulse height spectra into two data regions. The count capacity is 4096 counts per channel. The program receives and executes commands from the Teletype Keyboard. These commands start and stop data acquisition, determine the data area, display the area with markers, expand regions of interest on the scope, integrate (sum) the data between markers, print and punch out the data, output the data to DECtape and subtract data regions.

Other Programs Needed: PK8L (8-620C) and SINGDP (8-620B)

Storage Requirement: 4K

DECUS NO. 8-620B

SINGDP - Single Parameter, Double Precision, 1024 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 1024 channel double precision pulse height spectra. The count capacity is 16,777,216 counts per channel. The program receives and executes commands from the Teletype Keyboard. The commands start and stop data acquisition, display the data with markers, expand the regions of interest on the scope, integrate (sum) the data between the markers, print and punch out data, and output data to DECtape.

Other Programs Needed: PK8L (8-620C) and SINGS (8-620A)
Storage Requirement: 4K

DECUS NO. 8-620C

PK8L - 1024 Channel Off-Line Peak Location and Listing

This program provides an off-line peak location and listing capability for the 1024-channel data acquired by SINGS and SINGDP. The program continuously interrogates the switch register and interprets the contents as commands. The program can set a window of variable width on the display, rotate the spectrum past this window, print the channel number of the bright dot indicating the center of the window, display the channel number of the bright dot, print the peak centroid, store the centroid in a list of known calibration peaks, store the centroid in a list of unknown peaks, list the calibration peaks and list the unknown peaks.

Other Programs Needed: SINGS (8-620A) and SINGDP (8-620B)
Storage Requirement: 4K

DECUS NO. 8-620D

SING8K - Single Parameter Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 4096 channel pulse height spectra. The count capacity is 262,144 counts per channel. The program receives and executes commands from the Teletype Keyboard. These commands start and stop data acquisitions, display the data with markers, expand regions of interest on the scope, integrate (sum) the data between markers, type and punch out data, and output data to DECtape.

Other Programs Needed: PK8K (8-620E)
Storage Requirement: 8K

DECUS NO. 8-620E

PK8K - 4096 Channel Off-Line Peak Location and Listing

This program provides an off-line peak location and listing capability for the 4096 channel data acquired by SING8K. The program continuously interrogates the switch register and interprets the contents as commands. The program can set a window of variable width on the display, rotate the spectrum past this window, print the channel number of the bright dot indicating the center of the window, display the channel number of the bright dot, find the centroid of the peak indicated by the bright dot, print the peak centroid, store the centroid in a list of either known or unknown peaks, and list either the known or unknown peaks.

Other Programs Needed: SING8K (8-620D)
Storage Requirement: 8K

DECUS NO. 8-621

Gray Code Conversion Package

Garth Peterson, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

Gray Code Conversion Package contains one subroutine for converting from binary to Gray code and three subroutines for converting Gray code to binary. The three Gray-to-binary subroutines provide a trade-off between speed and core usage.

Source Language: PAL-D

DECUS NO. 8-622

KV8/I - VTØ1 Device Handler

Erik Seliak, Dept. of Information Science, University of Melbourne, Parkville, Victoria, Australia

This is a handler for the VT01 storage display with the KV8/I-VS8E vector generator. It uses the DEC supplied Variable Stroke Character Generator routine and includes character size setting, and clear screen commands which may be entered via the teletype. When the screen is full the handler waits for any character to be typed before clearing the screen and continuing. Because the handler does not fit into two pages part of it is swapped in and out when the handler is called, but the system sees only a two page handler.

Minimum Hardware: PS/8 or OS/8, KV8/I-VTØ1 or VS8E
Source Language: PAL-8

DECUS NO. 8-623

PAGER

Kevin Willoughby, Attleboro High School, Attleboro, Massachusetts

PAGER reads a symbolic tape and formats it, expanding tabs and paging as necessary. Unlike previous programs of this type (DECUS NO's 184 and 356), PAGER will handle both source and third pass tapes, supply any desired heading to each page, and has no operating restrictions.

Source Language: MACRO8 (PAL-D compatible)

DECUS NO. 8-624

DUMP and LOAD, TSS/8

David Wolfe, Carleton College, Northfield, Minnesota

This pair of programs provides a backup of TSS/8 (Edusystem 50) disk files on DECtape. Several options allow for flexible dumping and loading. All dumping and loading is done with the timesharing system running.

Minimum Hardware: PDP-8 with a minimum of one DECtape drive
Other Programs Needed: TSS/8 (Edusystem 50)
Source Language: PAL

DECUS NO. 8-625

Floating Integer Functions for use with 8K FORTRAN

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Supplies the FORTRAN programmer with floating integer functions similar to those available in FOCAL or BASIC. The three functions offered here operate on a floating ("real") argument and return a floating ("real") integer. No change mode takes place, and the programmer is not limited to arguments less than 2048.0.

Minimum Hardware: Paper tape system or PS/8-OS/8
Other Programs Needed: Linking Loader, FORTRAN (8K) Library
Source Language: SABR

DECUS NO. 8-626

Automated Electrooculography

Paul R. Hudak
Submitted by: Dr. John R. Bourne, Vanderbilt University, Nashville, Tennessee

A real-time program is described which, with the aid of some simple external circuitry, can be used as an automated clinical system for measuring a patient's electrooculogram (EOG) during periods of light and dark adaptation. Such clinical electrooculography is an aid in testing retinal function, but has previously been a time consuming task. A LAB 8/e computer with the standard A/D converter and Schmitt trigger interfaces and a minimum of 4K of memory are all that is necessary for proper operation. Reference should be made to an article, "Computer Automated Electrooculography," which appeared in Computers and Biomedical Research, Volume 5, pp. 654-658, 1972

Source Language: PAL III

DECUS NO. 8-627

TEXPAK - Program to Convert a Line of Text to Packed Octal Format

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The program accepts a line of typed text and prints out the simple 6-bit stripped octal equivalent that would be generated by the "text" pseudo-op in higher-level assemblers such as MACRO. Simple editing facilities are provided.

Source Language: PAL III

DECUS NO. 8-628

LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)

Larry Davis, Washington University and Torbjorn Alm, Autocode AB
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Modified version of DECUS NO. 8-102A for use under OS/8 (PS/8). OS/8 file input and output is allowed, which enables the user to prepare LISP programs using OS/8 EDIT. Input and output in ASCII. Facilities for writing own code in assembler to be added to the interpreter for evaluation of apecial functions are provided for.

Minimum Hardware: PS/8 Configuration
Other Programs Needed: PS/8-OS/8 Operating System
Storage Requirement: 8K
Source Language: PAL-8

DECUS NO. 8-629

Graphing Subroutines for 8K FORTRAN Programs

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program is offered because while graphing is perhaps more naturally done with interpretive languages such as FOCAL or BASIC, there are times when one wishes to do a graph of some sort as part of a FORTRAN program. Unfortunately, the inflexibility of a FORTRAN "Write" statement makes this a tedious bit of programming. Drawing a graph with an x-axis is even harder, if one wishes the points on curve and axis to be in line.

Minimum Hardware:	PDP-8 with TTY or DECwriter
Other Programs Needed:	Linking Loader, IFIX (FORTRAN Library)
Storage Requirement:	1 page, relocatable
Source Language:	SABR

DECUS NO. 8-630

Pulmonary Function Laboratory Programs

Richard H. Earle, M.D. and Dario B. Domizi, M.D., Biomedical Computer Facilities, The University of Chicago, Chicago, Illinois
Submitted by: Ronald C. Carter, Digital Equipment Corporation, Maynard, Massachusetts

The pulmonary testing software developed at the University of Chicago's Biomedical Computation Facilities is designed to operate on four (4) hardware configurations of the LAB-8/e system.

All tests are adapted for use with a pneumotachograph and the appropriate gas analyzers required for each test. The software is designed to automate the testing procedure and calculations of the following measurements: lung volumes, flow rates, open circuit nitrogen washout and single breath diffusing capacity. The DECtape oriented systems enable the user to store patient data on DECtape for later recall.

LAB-8/E Configuration	Order DECUS No.
4K Paper Tape System	8-630A (Spirometry Only)
8K Paper Tape System	8-630B
8K TD8-E/TU56	8-630C (For non-ROM systems request binary paper tape loader in addition to DTA)
8K TC08/TU56	8-630D
OS/8 DECtape systems	8-630E (Contains binaries and sources for 4K and 8K paper tape systems)

(See applicable Service Charge list for material available.)

Minimum Hardware:	Specific hardware requirements for each system/application can be found in document
Source Language:	PAL-8

DECUS NO. 8-631

MINT - Multiple Precision Integer Arithmetic Subroutine

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Arithmetic and input-output subroutines are provided for multiple precision integers.

Minimum Hardware:	PS/8, OS/8, OS/12
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 8-632

RWDF32

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

This FORTRAN and SABR callable program allows blocked input and output from DF32 disks where the block size is a parameter.

Minimum Hardware:	PS/8, OS/8, OS/12; DF32 disk
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 8-633

MAC8, 8K MACRO ASSEMBLER

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MAC8 is an 8K assembler which runs under PS/8, OS/8 or OS/12. It allows macros to be written along with other assembly language instructions.

Minimum Hardware:	PS/8, OS/8, OS/12
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-634

MOVE

Larry Davis, Carl Ralston, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MOVE is an OS/8 program for transferring files from one directory device to another directory device. It is efficient since it reads the input and output device directories only once.

DECUS NO 8-634 (Continued)

Minimum Hardware:	OS/8, OS/12 configuration
Other Programs Needed:	OS/8 or OS/12, Version 1 (May work with OS/8, V2)
Storage Requirement:	8K
Miscellaneous:	Changes given in document to make MOVE work with PS/8
Source Language:	PAL-8

DECUS NO. 8-635

PAL12D

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

PAL12D (Davis) is a modification of the PAL8 Assembler to allow either PDP-8 or LINC mnemonics.

Minimum Hardware:	PS/8, OS/8, OS/12 configuration
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-636

BEST - Binary to Symbolic Traductor

Michel Morel and Francoise Landre
Submitted by: J. A. Gaudron, E.N.S.E.E.C., Caen, France

The Binary to Symbolic Traductor accepts a paper tape in a binary format, and produces either a printed listing or a paper tape in ASCII format, acceptable to the PAL III Assembler. It can disassemble 8K programs, with interrupts and FPP instructions. It sorts out instructions from constants, and automatically produces tags at the referenced addresses, which helps the operator to understand quickly any program. The operator can converse with BEST, indicate various starting addresses, and options for outputs (Automatic paging, Pass 3 listing).

Minimum Hardware:	8K PDP-8; ASR33; High speed reader
Source Language:	PAL III

DECUS NO. 8-637

A Flexible Data Buffer Display Routine for LAB-8 Systems

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This set of five subroutines may be called to display the contents of a data buffer on the oscilloscope of an AXØ8 (LAB-8) system. Software control of format as either a point or a histogram display, vertical scaling and placement in the two axes of the display is provided.

Minimum Hardware:	LAB-8 System with RM5Ø3 Display
Other Programs Needed:	User supplied subroutine to reset parameters as detailed in write-up
Storage Requirement:	162_8 locations on one page
Source Language:	PAL III

DECUS NO. 8-638

GEOMAS

Dr. Peter Duncan, University of Puerto Rico, Department of Marine Services, Mayaguez, Puerto Rico

The program GEOMAS, developed for the SEAMAP program of the University of Puerto Rico, calculates

(i) Great circle distance between two oceanographic stations

(ii) The mean latitude between the stations

(iii) The coriolis parameter for the mean latitude

(iv) Geostrophic velocities relative to a depth chosen by the operator or to the greatest depth common to both stations

(v) Geostrophic volume transports between given depths (by trapezoidal interpolation) and the total transport between the surface and the reference depth.

A description of the format and manner in which the input depths and dynamic heights are entered, is contained on comment cards in the program.

Minimum Hardware:	OS/8, 12K, TD8E
Source Language:	FORTRAN II

DECUS NO. 8-639

OS/8 DISASM

John E. Curtis, Curtis Institute, East Moriches, New York

OS/8 DISASM is a disassembler for the conversion of aboslute binary files into listings or source files under OS/8. Symbol table definition features permit the reconstruction of literals, direct off-page references, address and data tables, and the insertion of suppressed origins for overlays. DISASM is designed for multi-field programs. Symbols are defined by field and only current field labels are output as labels and direct addresses. Listing organization is designed for ease of interpretation. Source output is designed to imitate programs written by experienced programmers. SPLIT, a program to split large binary files into many small files for easy disassembly, is included.

Minimum Hardware:	8K OS/8 System
Source Language:	PAL-8

DECUS NO. 8-640

OS/8 EDIT PLUS

John E. Curtis, Curtis Institute, East Moriches, New York

EDIT PLUS is an editor for OS/8 designed for the full ASCII character set. It will accept and store all codes from 200 to 377 except those used for control characters. It also has two additional search features. Stream searches permit the merging of lines and complete revision of line boundaries. Inter-buffer dump searches permit the extraction of selected entries via searches. EDIT PLUS permits the input and output file lists to be altered during operation. The rubout and line-feed-repeat features of the OS/8 Monitor are used.

Minimum Hardware: 8K OS/8 System
Restrictions: EDIT PLUS does not recognize the ESC 3 and ESC 4 codes used by the Model 38 for ribbon color changes. These may cause tabulation errors. The special routine required is small, but the table changes required would mean complete reorganization of many pages. On the author's system both OS/8 EDIT and EDIT PLUS sometimes print two spurious characters on return to command mode.
Source Language: PAL-8

DECUS NO. 8-641

OS/8 FORMAT

John E. Curtis, Curtis Institute, East Moriches, New York

FORMAT is supplied as a PAL-8 source tape for easy modification to conform to the user's system. It is written for a system with no line printer and uses the device name LPT and device code 4. Designed for Model 33 and 38 Teletypes with 8 1/2 friction feed options, it can be modified for other terminals. Its tables are set for PAL-8 listings and general PIP dumps of ASCII files.

FORMAT offers the following controls:

1. Individually set tabulation positions.

2. Pagination of output. A switch register option permits inserting a halt between pages for paper changer, etc.

3. Right margin limit to suppress pile-up and Model 38 automatic carriage returns.

4. Left margin control as a switch register option.

5. Vertical tabulation, a set number of lines advance.

6. Model 38 ribbon change commands do not alter tabulation.

Minimum Hardware: OS/8 System, Model 33 or 38 TTY
Source Language: PAL-8

DECUS NO. 8-642

AUTOCO - Autocorrelation for Poor People (Without EAE)

Theodore J. Glattke, Stanford University School of Medicine, Stanford, California

The program obtains an autocorrelation function on a string of data up to 512_{10} points by computing a Pearson product-moment correlation coefficient between elements in the string and those elements "delayed" with respect to themselves. It is particularly useful in extracting periodic components from EEG and similar data; and for providing precise indices of their temporal cadence.

Minimum Hardware: PDP-8 or PDP-8/I with DECtapes and Oscilloscope display control, such as VC8/I or 34D
Source Language: XPAL

DECUS NO. 8-643

LIFE

Philip Corman, Stewart Radiance Laboratory, Bedford, Massachusetts

An OS/8 version of Conway's game "LIFE" as published in several Scientific American articles. The universe consists of a 32 X 32 matrix. Births and deaths are computed according to the number of nearest neighbors.

Minimum Hardware: 8K PDP-8/E
Other Programs Needed: OS/8
Source Language: 8K FORTRAN - OS/8

DECUS NO. 8-644

MINMON - TD8E DECtape Minimonitor

Ian H. Witten, Department of Electrical Engineering Science, University of Essex, United Kingdom

The TD8E Minimonitor enables 4K core images to be stored on DECtape and loaded when required. The monitor comprises:

a) A command decoder and DECtape read routine, normally occupying core locations 7600-7777;

b) a modified version of the BIN loader, a 200 word routine capable of being executed in any core page;

c) a DECtape write routine, a 200 word routine capable of being executed in any core page.

Minimum Hardware: 4K PDP-8/E, M or F, TD8EM and single TU56 DECtape drive
Restrictions: The TD8E minimonitor is incompatible with the OS8 DECtape file structure
Source Language: PAL III

DECUS NO. 8-645

Interfacing the PDP-8 to the Printec-100 Line Printer

H. E. Cronin, Naval Weapons Center, China Lake, California

Circuit and design considerations for interfacing the PDP-8 computer and a Printec-100 line printer. Three patches convert the TTY instructions in "FOCAL" and "EDU-10 BASIC" and "FORTRAN" to output to the line printer. An assembly language program to printout all the alphabetic and numeric characters for testing purposes is included as well as an overlay for FOCAL which uses a "P" command to cause either the teletype or the line printer to be used for output, according to the setting of a switch on the switch register.

Minimum Hardware:	PDP-8, TTY and Printec-100 Line Printer
Restrictions:	Does not use "interrupt" system
Source Language:	PAL

DECUS NO. 8-646

DECsystem-8

John R. Covert and Douglas E. Wrege, The Georgia Institute of Technology, Atlanta, Georgia

This package adds many of the PDP-10 operating system features to the PS/8 system, including the capability of further expansion of the monitor command set, the LOGON and KJOB (kill job) commands, and the compile command for shorthand calls to the standard language processors on the system. The philosophy of the additions to the system was to keep as much compatibility between the PDP-10 operating system and the PS/8 system as possible. In some cases, the command syntaxes used are not optimum, but are PDP-10 compatible. Users who use both the PDP-10 and the PS/8 systems on a day-by-day basis will be able to converse with both systems with a minimum of consideration of the differences in command syntaxes.

Minimum Hardware:	Standard OS/8 configuration
Other Programs Needed:	PS/8 or OS/8
Source Language:	PAL

DECUS NO. 8-647

FULMIX - Complete Permutation Program

Bradford Needham, South Salem High School, Salem, Oregon

Prints all the unique permutations of a given set of units, using the minimum amount of paper (limit of 32 decimal units, but can be easily increased). These units may be any number of characters, and any number of units may be alike.

Minimum Hardware:	PDP-8/L, TTY
Source Language:	Machine Language

DECUS NO. 8-648

LOGMIN - Logic Minimization Program

David Wu, Princeton University, Princeton, New Jersey

LOGMIN is useful to the logic designer for determining or checking the two-level minimized representation of a logic function, given that function in its sum-of-products or product-of-sums form. The function need not be in its canonical representation.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	PAL-8

DECUS NO. 8-649

QPIP - OS/8 Directory Editing Program

B. D. Monahan, Standard Telecommunication Laboratories, Ltd., Harlow, Essex, England

Provides a few file management facilities not available with OS/8 PIP. These are:

1. Deleting files undeletable by PIP
2. Reserving space on a directory device
3. Changing names of files without having to transfer their contents
4. Handling inquiries for device information

To do this the program incorporates its own command decoder, with syntax identical to the usual one, but allowing any characters except " @ " in device names, file names and extensions.

Minimum Hardware:	BASIC OS/8 System
Storage Requirement:	8K
Restrictions:	Will not currently run under OS/8 BATCH monitor
Source Language:	PAL-8

DECUS NO. 8-650

AMIPED - Automated Medical Interview With Pediatric Data Files

David C. Mauger, University of Auckland, Auckland Hospital, Auckland, New Zealand

This program is designed to administer a series of questions in an interactive, branching manner to record and print a summary of the answers, and to generate a file of these for later reference.

The questions supplied are of a pediatric medical nature, and are intended to relieve the doctor of personally eliciting some of the repetitious and standardized parts of the pediatric history, but the programs could administer, without change, any series of questions. Questions need not be medical.

Minimum Hardware:	OS/8 Configuration
Storage Requirement:	8K
Source Language:	OS/8 BASIC

DECUS NO. 8-651

SOLMT (Sort Overlay Listings Using Magnetic Tape)

K. G. Jones
Submitted by: G. E. Collins, Vickers Limited Medical Engineering, Basingstoke, Hampshire, England

This program can be used to produce a composite listing of a PAL-8 program which has been built from a number of overlay programs. Input and output are on DECtape.

Minimum Hardware:	8K PDP-8, 2 DECtapes, High Speed Paper Tape Reader
Other Programs Needed:	PS/8
Restrictions:	Does not use command decoder in OS/8
Source Language:	PAL-8

DECUS NO. 8-652

Regression Analysis Package

Theodore E. Bridge, 54 Williamsburg Drive, Springfield, Massachusetts

This package is a group of programs for making a multiple regression with up to 3 independent variables, and up to 28 degrees of freedom. We assume that a dependent variable (W) may be represented by a polynomial function of independent variables (X, Y, Z). We enter data for many points, and ask the computer to find the coefficients for a least squares fit. Provision is made for dumping the coefficients to tape, and reloading in a new location.

Minimum Hardware:	4K PDP-8/F
Other Programs Needed:	3 page floating point package
Source Language:	PAL

DECUS NO. 8-653

MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O

Robert F. Thomas, Boston College, Chestnut Hill, Massachusetts

The Tape Monitor provides the facility to control an industry compatible 9 track 800 bpi magnetic tape unit interfaced with a TR05-A Interface. The monitor responds to four commands from the keyboard: STORE, EXECUTE, DELETE, and LIST.

A complete set of library programs is also provided to allow I/O through the 8K FORTRAN, SABR and LINKING LOADER system. All usual utilities plus fully formatted I/O can be performed. The magtape drive can be programmed like any other formatted device.

Minimum Hardware:	8K PDP-8, TRØ5-A 9 track 800 BPI Magtape, ASR33
Other Programs Needed:	Paper Tape Operating System
Source Language:	PAL III, SABR

DECUS NO. 8-654

Cabrillo Test Grader

Don Singer, Forest Gove Union High School, Forest Grove, Oregon
Submitted by: Cabrillo Computer Center, Lompoc, California

This is an assembly language version of DEC's Edutest Test Grading Program. It uses standard Edutest cards and is more efficient and foolproof than Edutest. It produces an optional individual student printout with either right or wrong questions listed, produces a class list showing # of questions each student answered right and his percentage score, and an item analysis showing how many times each question was missed and the correct answer as read from the key card. It handles 999 students and a maximum of 100 questions.

Minimum Hardware:	4K PDP-8/E with CM8-E optical mark sense card
Source Language:	PAL III

DECUS NO. 8-655

Patches to CINET-BASIC (DECUS NO. 8-159)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The first patch replaces the internal 'ALIGN' and 'FIX' routines. The "INT(X)" function is now freed from any restrictions on the size of its argument, X. This patch overlays existing core used by the floating point routines and is invisible to the user. No sacrifice is made by loading it.

The second patch is a compromise. It reenables the "SGN(X)" function but has certain drawbacks which are stated in the documentation.

Restrictions:	SGN uses 7600-7610 which is free in paper tape systems - not in operating system
Source Language:	PAL III

DECUS NO. 8-656

SELFDRILL - The Sloan Selfdrill Program

Francis M. Wheeler, Beloit College, Beloit, Wisconsin

This program converts a PDP-8 with teletype into a general learning school, i.e., the program is totally independent of subject matter. User types a set of cue/response items into core file. Program presents each cue repetitively, at intervals determined by user's response to the particular item, until he is able to type the specified response quickly, accurately and consistently. Includes file edit features, tape read and punchout of drill items, the capability of systematic review, randomized comments, randomized use of learner's name, program-assisted typing with instant feedback and mitigation of non-significant errors during response.

Minimum Hardware:	4K PDP-8, ASR33
Restrictions:	File limited to 1278 characters
Source Language:	PAL III

DECUS NO. 8-657A

INPUT, A Neurophysiological Data Collecting Program

Fred Delcomyn, University of Illinois, Urbana, Illinois

This program, the first of three sets of interrelated routines, will accept up to three channels of pulse input and four channels of analog input via the AXØ8 Laboratory Peripheral. Data consisting of the time interval between the pulse inputs, and the amplitude of the analog inputs (measured at user-specified intervals) are stored in data buffers from which they are written onto a disk via another routine (from the second of the three sets). The data stored on disk may be "translated" by routines contained in the third set into ASCII coded decimal digits for subsequent analysis.

Minimum Hardware:	8K PDP-8, 8/I, LAB-8; AXØ8 Laboratory Peripheral; DF32 Disk
Other Programs Needed:	Disk Monitor System; DSKFIL (DECUS 8-657B); TR (DECUS 8-657C)
Source Language:	PAL-D

DECUS NO. 8-657B

DSKFIL, A File Structured Disk Writing Routine and Helpers

Fred Delcomyn, University of Illinois, Urbana, Illinois

This collection of subroutines sets up a disk file for data, and copies blocks of data from core to disk within the confines of a file-structured organization of the disk. The write-routine allows the data to be written contiguously in a file, yet at different times. A short controlling program is included with the subroutines for stand-alone usage.

Minimum Hardware:	4K PDP-8, 8/I; DF-32 Disk
Other Programs Needed:	Disk Monitor System
Restrictions:	Copies whole pages only to the disk
Source Language:	PAL-D

DECUS NO. 8-657C

TR, Binary to ASCII Translator

Fred Delcomyn, University of Illinois, Urbana, Illinois

The routines and patches in this collection constitute a modification of the System routine PIP (DEC-D8-PDAD-PB 12/30/69) which will allow it to act as a "translator" of single or double precision, signed or unsigned, fixed point binary numbers into ASCII coded decimal numbers. The numbers may be stored in a disk file or punched out on paper tape. The routines are specifically designed to handle data in the format produced by the program INPUT. Any data which follow this format can be translated.

Minimum Hardware:	4K PDP-8, 8/I; DF-32 Disk
Other Programs Needed:	Disk Monitor System; PIP (DEC-D8-PDAD-PB 12/30/69)
Restrictions:	Accepts only disk files as input
Source Language:	PAL-D

DECUS NO. 8-658

Extended Double Precision Interpretive Package

Bruce D. Geelhood, University of Washington, Seattle, Washington

This is a revised and extended version of the double precision interpretive package submitted by Roger Anderson in 1968 (DECUS 8-115a). This package performs double precision signed integer arithmetic operations using specially defined single word memory reference instructions. The package is similar to the Floating Point Package (D IG-8-5-S) but occupies much less core. Only two pages of memory and 15 words on page zero are required. This package performs the arithmetic operations of addition, subtraction, multiplication, and division. It can also jump in the interpretive mode, execute external subroutines, store into core double precision, and perform several non-MRI operate commands. The operate commands enable clearing, branching, negating and exiting. This extended version is superior to its predecessor in that it has complete overflow protection, several operate instructions, and an easy method of adding additional functions. In spite of these extensions the new package occupies the same amount of memory.

Minimum Hardware:	PDP-5 or any PDP-8 family computer
Restrictions:	Source compiled on CDC6400 by PAL6400, a cross-assembler
Source Language:	PAL III

DECUS NO. 8-659

VT05

Lars Palmer, A B Hassle, Molndal, Sweden

This is an OS/8-handler for a fast VT05. This handler will supply the necessary fillers after a CR/LF. It will also allow you to paginate the file on the display; i.e., it will wait after each page (form feed or 20 lines) to allow you to read the display.

Minimum Hardware:	PDP-8/E (only), VT05 at 600 baud or above
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	1 page
Source Language:	PAL-8

DECUS NO. 8-660

STAT

Lars Palmer, A B Hassle, Molndal, Sweden

STAT is a development from statpack, the FOCAL statistical package. Its main differences from other packages are:

1) All routines compensate for missing data. Any observation that is set to 0 will be considered missing and excluded from calculations (but e.g. 1E-10 is a legal entry that will be included).

DECUS NO. 8-660 (Continued)

2) All implement analyses can be done on the data in core thereby saving much input time.

3) In 12K it will take into core a total of 1000 data points divided into maximum 10 columns.

4) The following routines are implemented at present: mean and standard errors, t-tests, regression line, correlation matrix, analysis of variance paired and unpaired, Mann-Whitney U-test, Wilkoxon matched pairs rank test, Spearman rank.

Minimum Hardware:	PDP-8, any F4 system, OS/8
Other Programs Needed:	F4 compiler, write-up for DECUS FOCAL8-266
Storage Requirement:	12K in OS/8
Source Language:	FORTRAN IV

DECUS NO. 8-661

LESQ, General Non-Linear Least Squares

Lars Palmer, A B Hassle, Molndal, Sweden

LESQ implements the Gauss-Newton method for determining the best fit constants to a given non-linear curve.

The theoretical method is well described in the write-up to FOCAL8-72 (the mathematical methods used are the same, but there is no relationship in the programs). The program contains the following features:

a) The function to be used is written as a FORTRAN function and added to the system.

b) All derivatives needed are calculated numerically.

c) The program will accept up to 6 constants and up to 30 data points.

d) The program calculates the error matrix for all the constants and outputs a table of calculated y values versus experimental.

e) In an FPP-12 configuration the program iterates most functions in under 10 seconds.

Minimum Hardware:	PDP-8, any F4 system, OS/8
Other Programs Needed:	F4 compiler; write-up to DECUS FOCAL8-72 useful
Storage Requirement:	12K in OS/8
Source Language:	FORTRAN IV

DECUS NO. 8-662

UNDEFSYBLIST - Undefined Symbol List

Roger Geffen, Data Research Associates, Wayland, Massachusetts

This patch, based on the "Alpha List" program by W. F. Haygood, Jr., causes MACRO-8 to list any undefined symbols at the end of pass 1. Space for the patch is made by slightly reducing the size of the HSR buffer.

Other Programs Needed:	MACRO-8
Source Language:	PAL

DECUS NO. 8-663

REPROD - Read, Punch and Verify Product

Robert G. Weiss, Concord College, Athens, West Virginia

REPROD is effective for smaller installations where a wide range of attachments are not available for reliable paper tape duplication. This program reads the paper tape from the LSR of TTY #2 (assigned device code 40_8, which may be easily reassigned by a simple patch). The tape is then punched on the primary teletype (TTY #1) and passed through the LSR on the same TTY for verification from a buffer. This provides one physical pass reproduction with verification.

Minimum Hardware:	4K PDP-8, 8/I, or 8/E; two teletypes (ASR 33) in configuration with related hardware
Other Programs Needed:	Binary loader (loading only), any version meeting standard format
Storage Requirement:	200_8-577_8 (including I/O buffer, or any two consecutive pages by minor modifications)
Source Language:	PAL-III

DECUS NO. 8-664

FREQHS - A Subroutine to Generate a Frequency Histogram From Stored Interval Measurements

A. J. Swan, Agricultural Research Council's PoultryResearch Centre, Edinburgh, Scotland

It is often useful to reconstruct the frequency of events from stored data on the inter-event intervals. A subroutine has been developed to perform this task. Applications have been found in determining variations in unit neuron firing rates and in heart rate determinations.

Minimum Hardware:	Any PDP-8 configuration
Storage Requirement:	110_8 locations on any page
Restrictions:	The intervals should be non-zero
Source Language:	PAL III

DECUS NO. 8-665

INTVAL - A Subroutine to Measure Inter-Event Intervals

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This subroutine may be called to measure the time interval between events with a specified degree of accuracy. Intervals are stored as non-zero, single precision, unsigned integers. This is an efficient way to code activity information since histograms can easily be generated to allow examination of the activity later.

Minimum Hardware:	Any Lab 8 configuration
Storage Requirement:	3 locations on page zero and 107_8 locations on any other page
Restrictions:	All device flags must be cleared before call
Source Language:	PAL III

DECUS NO. 8-666

NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This subroutine may be called to generate nth order histograms from stored inter-event intervals. The main advantages are that only interval measurements need be stored permanently and the order n can be varied to suit the prevailing situation at histogram generation. The main use has been to generate histograms to estimate the nth order probability density functions of the inter-event interval distributions encountered in unit neuronal activity studies.

Minimum Hardware:	PDP-8
Storage Requirement:	120_8 locations on a single page
Restrictions:	Intervals are expected to be non-zero
Source Language:	PAL III

DECUS NO. 8-667

LABLDP - A TSS/8 Tape Labeling Program

Leonard P. Levine, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin

LABLDP is a TSS/8 program to punch a user inputted buffer of characters in block form into the high speed papertape output. Automatic assignment of the high speed punch is done as LABLDP starts. Editing of the user input via rubout commands may be done before the output is punched. The user's account number and the correct date are the first characters punched into the output buffer. This information may be deleted if desired by the user.

Minimum Hardware:	TSS/8, High Speed Punch
Other Programs Needed:	PIP
Source Language:	PAL-D

DECUS NO. 8-668

RAW - A Reverse Assembler of Windsor

P. A. V. Thomas, University of Windsor, Windsor, Ontario Canada

This program was written for a 4K PDP-8 computer to obtain a symbolic program from a binary program produced by the PAL III assembler. The output obtained may be in the standard assembler output format or in a format suitable as input to the assembler for reassembling after modification. The program will handle most of the standard mnemonics including EAE and floating point operations. The only known limitations are (i) a FIELD statement is not acceptable and (ii) subroutines with multiple arguments and/or returns will not give a properly formatted output but will have to be interpretted by the user.

Minimum Hardware:	PDP-8, HSR desirable, TTY
Other Programs Needed:	Binary loader
Storage Requirement:	4K
Restrictions:	FIELD statement not allowed for. Entry to Floating Point Package assumed if instruction JMS I 7 (4407) is contained in program
Source Language:	PAL III

DECUS NO. 8-669

BIOLSD - Antibiotic Assay Using Latin Square Design

J. D. Piguet, Institute of Hygiene, Department of Bacteriology, Geneva, Switzerland

This program computes the potency of an unknown preparation of an antibiotic from the diameters of inhibition given by three dilutions of this preparation and three dilutions of a standard preparation, when the doses are applied in a 6 x 6 Latin square with each dose occurring once in each row and column. When all 36 diameters have been entered through the keyboard or one of the readers, the teletype prints the complete analysis of variance, the potency of the test preparation, expressed as a percentage of the standard preparation, the fiducial limits for P = 0.95, and the fiducial interval, expressed as a percentage of the potency.

BIOLSD is available in French or in English.

Minimum Hardware:	4K PDP-8/E, ASR33, high speed reader optional
Other Programs Needed:	27 bit Floating Point Package (DEC-08-NFPEA-A-PB)
Restrictions:	PDP-8/E only
Source Language:	MACRO-8

DECUS NO. 8-670

Basic Plotting Package for OS/8 FORTRAN IV

Jonathan R. Gross, University of Minnesota West Bank, Minneapolis, Minnesota

Basic plotting package including: PLOT (X, Y, IPEN), SYMBOL (X, Y, HGT, BCD, ANGD, N), ASSIGN (X, Y), WHERE (X, Y), FACTOR (FACT), NUMBER (X, Y, HGT, -VAL, ANGD, ND), and program TAB to generate a table of symbols and their values.

Minimum Hardware:	OS/8 PDP-8/E with EAE and XY8E
Other Programs Needed:	FORTRAN IV
Storage Requirement:	5 pages (basic)
Restrictions:	Names conflict with PDP-12 library routines. Uses mode B of EAE
Miscellaneous:	Documentation at beginning of each program source
Source Language:	RALF, FORTRAN IV

DECUS NO. 8-671

Restoring Symbolprint

A. Moses, Applied Math Co., Anthony, Texas

RESTORING SYMBOLPRINT automatically reloads the original contents of locations 10, 11 and 12 which have been destroyed by using Symbolprint after compiling a program in 4K FORTRAN.

Other Programs Needed:	4K FORTRAN Compiler (DEC-08-AFCI)
Storage Requirement:	4K
Source Language:	PAL III

DECUS NO. 8-672

XCBL and XBIN Loader

L. Paul Geffen and Roger Geffen, Data Research Associates, Wayland, Massachusetts

This combination XCBL and XBIN loader selects correct loader automatically. High speed version is offered but instructions are given for use with low-speed reader also.

Minimum Hardware:	PDP-8/E (Should work with other PDP-8s)
Restrictions:	Will not ignore spaces between rubouts as standard BIN will
Source Language:	PAL (Will tab only with MACRO)

DECUS NO. 8-673

Random Number Generators for Use With FORTRAN or SABR Programs

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Two 35-bit random generators taken from Knuth's "Semi-numerical Algorithms," adapted to the 27-bit format of the PDP-8 FORTRAN/SABR library. The user can preset the starting point of either sequence by his choice of argument in the calls Y = RAND (X) or Y = RND (X).

Minimum Hardware:	PDP-8 with paper tape or OS/8 - PS/8
Other Programs Needed:	Linking Loader
Storage Requirement:	2 contiguous pages (relocatable)
Restrictions:	7th decimal digit slightly de-randomized
Source Language:	SABR

DECUS NO. 8-674

External - Or RC - Clock (AXØ8) Calibration

Klaus Lickteig, Institut fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

This clock calibration program determines the clock period (milliseconds) or the clock frequency (kH_8) of an external clock or the RC-clock of the AXØ8. The respective period of frequency will be displayed on the oscilloscope of the AXØ8. The program, which can be used as a subroutine, stores the clock period (msec) at location "RCTIME" in the normal DEC Floating Point format. Range of application: 838, 8608 sec = t = 0.03 msec.

Minimum Hardware:	PDP-8, 4K memory, AXØ8, ASR-33 (LAB-8 system)
Other Programs Needed:	DEC-08-YQ2B-PB (Version B only!!)
Source Language:	PAL III

DECUS NO. 8-675

INDUMP - Input Dump

Donna Stevens, New Mexico State University, Las Cruces, New Mexico

This program prints out the content of the input buffer each time external print is received. Bit 11 on the switch register allows the option of printout in binary or octal. It was developed as a programming aid, but is used extensively for design, diagnosis of problems, and repair of research apparatus.

Minimum Hardware:	4K PDP-8/E, external input to buffer, TTY
Restrictions:	Endless loop unless HALT toggled in or manually halted
Source Language:	PAL III

DECUS NO. 8-676

MOVE DELETE

Roger Geffen, Data Research Associates, Wayland, Massachusetts

This patch moves the 'DELETE' routine to the space reserved for the base page literal buffer to make room for other patches in MACRO-8.

Other Programs Needed: DEC-08-CMAB-PB
Source Language: PAL

DECUS NO. 8-677

STAR PIP

David M. Kristol, 462 Green Street, Cambridge, Massachusetts

"STAR PIP" is an extremely useful file utility program for OS/8 that incorporates some of the features of PDP-10 PIP. Foremost of these is the ability to move and delete files with common extensions or names. (STAR PIP is not a modified PIP, but a separate program. PIP functions are NOT duplicated in STAR PIP).

Minimum Hardware: PS/8 or OS/8 System
Storage Requirement: 8K
Source Language: PAL-8

DECUS NO. 8-678

Routine to Expand and Modify the DEC Floating Point Package

Klaus Lickteig, Institut fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

This package includes:

1. Routines to control the input and output device.
2. Routines to convert numbers of 12 bits and 24 bit length or of Floating-Point format. 3. Routine to determine the octal form of a decimal Floating-Point number.

Other Programs Needed: Floating-Point Package, Version B (DEC-08-YQYB-PB)
Source Language: PAL III

DECUS NO. 8-679

MAPPER

James Puccio, Canton High School, Canton, Massachusetts

This program provides the TSS/8 PAL programmer with a method of mapping out precisely where in core his object program shall lie. The report is printed out on 8 1/2 X 11" pages, and a report of the total amount of core used is also provided.

Minimum Hardware: TSS/8, DISK, ASR-33, EAE
Storage Requirement: 2 TSS/8 DISK Segments
Restrictions: Will not operate properly if input file name is over 6 characters
Source Language: TSS/8 PAL

DECUS NO. 8-680

WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions

Nezih Geckinli, Middle East Technical University, Ankara, Turkey

The FWT subroutine enables the user to take either the Fast Walsh Transform (FWT) or its inverse (IFWT) of a real valued series. The subroutine FWT, which begins at Ø2ØØ, calculates both the FWT and IFWT.

Minimum Hardware: 4K PDP-8
Source Language: PAL III

DECUS NO. 8-681

CASE - Carleton Symbolic Editor

Bruce Christopher, Carleton College, Northfield, Minnesota

This symbolic editor adds new commands to the original EDIT-8 program copyright by DEC in 1970 and revised for TSS/8 by Rick Merrill (4/17/70). Among the new features are a new command H, to append from the high-speed reader; line numbers printed on the line-printer or teletype but not on the high speed punch; a command U, to release the high-speed reader, line printer and high-speed punch; tabs not followed by rubout in the ASCII disk file intra-buffer string searching and many others.

Minimum Hardware: TSS/8 22B, ASR-33, line-printer, high speed reader and punch, EAE
Storage Requirement: 4K
Source Language: PAL-8

DECUS NO. 8-682

SCPSYS (Scope System)

Donald C, Amoss, Clemson University, Clemson, South Carolina

"SCPSYS" (Scope System) is an editing, filing and assembling system for use on the PDP-8 computer equipped with DECtape, display and EAE. The interactive CRT based system provides quick user response and has shown to be instrumental in decreasing the time required for user familiarization. This has proven particularly beneficial in the educational environment. An interactive FOCAL/SCPSYS system has been developed to provide a more convenient means of saving FOCAL programs on DECtape. An adaptation to the FORTRAN-D system is also available which includes DECtape read/write commands and multi-level subroutine commands (basically a JMS rather than JMP).

DECUS NO. 8-682 (Continued)

Ancillary programs included in the basic system include a block-to-block "COPY" program, an octal listing (OLIST) program, a DECtape word manipulator (MODIFY), a program to convert existing DECUS files to SCPSYS (ADDECUS), and general purpose message display and interrogation programs (Q + A, for Question & Answer, UNPACK, and UNPACKD). This system, in various stages of development, has been in use by many users and several classes since the latter part of 1970.

Minimum Hardware: 4K PDP-8, TTY, DECtape, display
Source Language: PAL III

DECUS NO. 8-683

BNLOAD, TSS/8 Binary Loader

Bret Saxe, 1021 Washington Avenue, Albany, New York

BNLOAD is a TSS/8 user program to load binary format tapes directly into core. It is an alternative to the lengthy binary tape loading procedure (requiring PIP and LOADER) presently in effect on most TSS/8 installations.

Minimum Hardware: TSS/8, High-Speed Reader, TTY
Storage Requirement: 1 page (7600-7777)
Restrictions: Works only on TSS/8
Source Language: TSS/8 PAL-D

DECUS NO. 8-684

Injection Patcher - IJPA

Garth Peterson, South Dakota School of Mines and Technology, Rapid City, South Dakota

Injection Patcher accepts and stores program patches in field 1. Patches may be read in as binary tapes or may be entered in octal on the teletype keyboard. After the patches have been stored, a main binary input tape is read and a new main binary tape is punched out with patches inserted at the appropriate locations rather than being appended at the end. The srored patches may also be dumped as a binary tape.

Minimum Hardware: 8K PDP-8, paper tape reader and punch (high or low speed)
Source Language: PAL-D

DECUS NO. 8-685

DPSQRT - Double Precision Square Root for PDP-8

Jay Mickevicius, University of Illinois, Chicago, Illinois

DPSQRT is a subroutine to compute a single precision square root from a double precision argument. The argument is assumed positive and can be up to 24 bits in length. This program is a modification of DECUS 8-61.

Source Language: PAL

DECUS NO. 8-686

Bowling League Results, Standings and Averages

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

The purpose of this program is to automate the task of preparing weekly bowling results. These programs were written for a 16-team league and 128 bowlers, including substitutes. There is room for expansion if your league requires more teams and/or bowlers.

Average time per week is under thirty minutes.

Minimum Hardware: PDP-8/12 family, one mass storage device
Other Programs Needed: COS 300 (DEC-08-OCOSA-A-UO) 8/E 12
Storage Requirement:
Source Language: DIBOL

DECUS NO. 8-687

GOLF

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program, written in DIBOL for the COS 300 operating system, invites the user to play golf at the championship course just minutes from the heart of downtown Maynard. The game is explained as you proceed to the first tee.

Minimum Hardware: PDP-8/12 family, 1 mass storage device, high-speed reader
Other Programs Needed: COS 300 (DEC-08-OCOSA-A-UO) 8/E 12
Storage Requirement: 8K
Source Language: DIBOL

DECUS NO. 8-688

FOOTBALL

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program is written in DIBOL and requires the COS 300 operating system. With an LA30 as the console, it takes approximately 12 minutes to play a complete game. In the event of a tie at the end of regulation time, a sudden death overtime period may be initiated with the team that kicked-off to start the first half kicking again.

At the conclusion of the game, statistics on first downs, yards gained, passing, etc., will be displayed on the terminal and cumulative data will be updated on logical unit 5.

DECUS NO. 8-688 (Continued)

Minimum Hardware: PDP-8/12 family; one mass storage device, high-speed paper tape reader
Other Programs Needed: COS-3ØØ (DEC- 08-OCOSA-A-UO)
8E
12
Storage Requirement: 8K
Source Language: DIBOL

DECUS NO. 8-689

UFDSPY - A TSS/8 Line-Printer UFD Dump Program

James Ward, Natick High School, Natick, Massachusetts

UFDSPY is a program designed to dump the user's file directory (UFD) in readable form onto the line-printer. A header is printed consisting of the user's account number, the system date, and column headings. Information printed for each file includes the file name, extension, protection code, number of segments occupied by the file, date of creation, pointer to retrieval, and the link to the next UFD entry. At the end of the listing the total number of blocks in use by the files on this account is printed.

Minimum Hardware: TSS/8 Configuration and Line-Printer
Storage Requirement: 1K
Source Language: PAL-D

DECUS NO. 8-690

RANDU

Lars Palmer, A B Hassle, Fack, Molndal, Sweden

This is the random number generator from DECUS 5-25 interfaced to the FORTRAN IV system. The routine also contains a possibility to generate a truly random starting point for the pseudo random sequence.

Minimum Hardware: OS/8 system
Other Programs Needed: OS/8 FORTRAN IV
Source Language: RALF

DECUS NO. 8-691

ACCK Timeshare Accounting System

Lynn H. Macey, Computer Services, Associated Colleges of Central Kansas, McPherson, Kansas

The ACCK Timeshare Accounting System is a direct replacement for the present method of running CAT under the system account. Historical data is kept on DECtape and various reports may be generated from this data. Reports include: daily, weekly, monthly and year to date as well as an inactive and individual account reports. Output may be on the teletype or an optional lineprinter.

The DECtape for this system is available directly from the author, to insure the most current release.

Minimum Hardware: TSS/8 - 22B, DECtape
Storage Requirement: 2K
Source Language: PAL-D

DECUS NO. 8-692

OLEVX AND OLEVAX, 4-Channel Averager and Analysis System

Gary D. Paige, University of California, Irvine; Irvine, California

The OLEV software system is a signal averager and analyzer designed for on-line neurophysiological experimentation (stimulus-evoked potential data, etc.). Up to 4 analog channels can be processed simultaneously. Sweep rate and sweep time are selectable to speeds as fast as 18/sec. and 25.6 ms./swp., respectively; up to 128 sweeps averaged in a given trial. Averages are formed by initially averaging sweeps to form consecutive component averages, which are then averaged to form the end result (a 32-sweep average will be formed from 4 component 8-sweep averages initially formed by the 32 sweeps, for example). All data can be stored on DECtape for future automatic analysis, including peak-to-peak amplitude and peak-latency data within any designated time window. Graphs of such data can be formed and stored automatically as well.

Minimum Hardware: PDP-8/I, AXØ8, 2 DTA units (TCØ1 software used)
Storage Requirement: 8K
Source Language: PAL-8

DECUS NO. 8-693

A Programmed Learning Course in Boolean Algebra

William Swan, University of Calgary, Alberta, Canada

This program is intended to help students to learn the fundamentals of Boolean algebra, using the TSS/8 facilities.

Minimum Hardware: PDP-8/I (TSS/8), TTY
Storage Requirement: 4K
Source Language: PAL-D

DECUS NO. 8-694

Teletype Line Printer Emulator Handler for OS/8

Stanley R, Vivian, University of Manitoba, Winnipeg, Canada

This OS/8 handler emulates the LP08 line printer on the ASR33 teletype. It handles form-feeds, tabs, line overrun and paging. A character count automatically generates a carriage return-line feed whenever the count exceeds 72. A line count automatically pages at 62 lines by introducing 4 additional CR/LF's to produce 11-inch pages. Due to space limitations in the handler, vertical tab results in a single additional CR/LF. An attempt to read from the handler

DECUS NO. 8-694 (Continued)

results in an immediate normal exit. First entry to the handler generates 4 CR/LF's. There is no closing form-feed.

Minimum Hardware:	OS/8 System
Other Programs Needed:	OS/8 and BUILD
Source Language:	PAL-8

DECUS NO. 8-695

Real Time Display Processor for a KV8 Graphic System and KW8 Clock

Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of 10 subroutines for an 8K FORTRAN system which allows FORTRAN or SABR programs to display changing graphic data on a VTØ1 scope used in a non-storage mode. The display processor performs the necessary refreshing, using program interrupts, at the maximum speed of the KV8 hardware. Provision is provided for displaying points, lines, and circular arcs, for reading joystick coordinates, testing the joystick flag, reading characters from the teletype and obtaining elapsed time from the real time clock, which may be used to calculate coordinates as a function of time. Core required is five (5) pages.

Minimum Hardware:	PDP-8, TTY, KV8/VTØ1/H306; KW8 (E) Real Time Clock*
Other Programs Needed:	8K FORTRAN (Paper Tape, PS/8 or OS/8)
Restrictions:	KW8 Model "E" clock assumed; others may also work
Miscellaneous:	*Clock only used by timer subroutines, not required for display
Source Language:	SABR

DECUS NO. 8-696

DECTYP, One-Word Signed Decimal Print

John Briggs, 2615 E 32nd Street, Davenport, Iowa

This subroutine will type out the signed decimal integer corresponding to the two's complement number contained in the accumulator. Spaces are inserted in the output to place the right-hand digit in a predictable position.

This subroutine saves 32_8 locations compared to the 134_8 location routine for DECUS 8-214.

Minimum Hardware:	PDP-8, TTY
Restrictions:	Must not run over the end of a page where loaded
Source Language:	PAL-D, PAL III

DECUS NO. 8-697

DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - Edusystem 50)

David Dodell, 11 South Hollow Road, Dix Hills, New York

This program will take the contents of a DECtape block and print it out on your teletype. Some features of the program are:

(a) input is by octal numbers, (b) restarting by ↑ C, (c) error message, (d) will print out job number if the DECtape is assigned to another job, (e) size-location 0-577 in core, 2 TSS/8 Disk Segments, (f) extra line feeds possible between lines of dump.

Minimum Hardware:	TSS/8-Edusystem 50, DECtape
Storage Requirement:	2 TSS/8 Disk Segments
Source Language:	PAL-D

DECUS NO. 8-698

TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010

P. C. Diegenbach, Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands

A library of OS/8 FORTRAN callable subroutines to use the Tektronix 4010 (or 4002) terminal with storage scope (and a 4610 hardcopy device if available). The subroutines serve graphic and alphanumeric in and output.

Minimum Hardware:	OS/8 or OS/12 Operating System, Tektronix 4010 Terminal
Other Programs Needed:	FORTRAN II
Storage Requirement:	2K
Miscellaneous:	A LINCtape is available for OS/12 users
Source Language:	FORTRAN-SABR

DECUS NO. 8-699

MPS External Event Common Routines

Thomas McLeod, Digital Equipment Corporation, Maynard, Massachusetts

The Microprocessor Series offers a priority vectored external event module which allows the accessing of up to eight software routines. This software package contains two common routines which would be entered by all of the above eight routines. The first would be entered and 5 of 7 registers and status codes saved in Random access memory (RAM). A user routine would then be entered and processing accomplished. The final routine would be the Restore routine.

Restrictions:	Registers D & E are used for temporary storage
Source Language:	MLA (Microprocessor Language Assembler)

DECUS NO. 8-700

JET AMBUSH

Steven Roy, Digital Equipment Corporation, Maynard, Massachusetts

Jet Ambush is a C.R.T. game program designed to run on series 8 and 12 computers. It is intended that the user write his own plot routine for his own C.R.T., however, it comes with a PDP-12 C.R.T. control. It creates a 64 x 64 display and the plot routine can scale it to the C.R.T. size. The game tests the user's skill at shooting down jets which appear randomly over a hillside. Control is through the switch register. The initial dialog explains how to play.

Minimum Hardware: 4K PDP-8 or PDP-12
Source Language: PAL III

DECUS NO. 8-701

TEXT: Readable Punch Handler for OS/8

Daniel Brown and Jim Van Zee, University of Washington, Seattle, Washington

This is a 2-page handler for the OS/8 monitor system which punches readable ASCII characters on a paper tape using the low-speed punch. A 4 x 6 matrix representation is used for each character. The handler may be used with FORTRAN and other system programs to add identification at the beginning of a tape.

Minimum Hardware: PDP-8 or PDP-12 with teletype
Other Programs Needed: OS/8, PS/8 or OS/12 Operating System
Storage Requirement: 2 pages
Source Language: PAL-8

DECUS NO. 8-702

COGO-8

Digital Equipment Corporation, Maynard, Massachusetts

COGO is a problem-oriented computer language and programming system for solving geometric problems. Typical problems suitable for COGO include: control and land surveys, right-or-way surveys, subdivision planning, construction layout, highway and interchange design, bridge geometry.

A knowledge of programming is not required to successfully use COGO.

COGO-90, originally developed by Professor C. L. Miller and his staff at the Massachusetts Institute of Technology, has been extended and implemented by Computer Dynamics Incorporated to run on a PDP-10 computer. COGO-8 is the PDP-10 version which also has been extended and implemented to run on any (PDP-8, PDP-12) OS/8 FORTRAN IV system which includes a minimum hardware configuration of 16K of memory and two DECtapes. The speed and operation of COGO-8 is greatly enhanced by the use of a disk and Floating Point Processor.

The OS/8 Reference Manual and OS/8 FORTRAN User's Manual (DEC-S8-CFTNA-A-D) are helpful reference quides to the COGO operation.

DECUS NO. 8-703

AMORT: Incremental Amortization Schedule

Susan Conrad
Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

The program computes an amortization schedule given the interest rate, amount of the loan, number of years over which the loan is to be repaid, and conversion periods per year.

From this information, the program computes the periodic payment and the portion of the periodic payment applied to the principal, the portion of the periodic payment applied to interest, and the balance at the time of each payment. All numbers are rounded to the nearest cent.

Other Programs Needed: OS/8 , 8K FORTRAN
Storage Requirement: 8K
Source Language: FORTRAN

DECUS NO. 8-704

ANOV1: Analysis of Variance, Unequal N

S. Tobias, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program computes a one way analysis of variance, means, variances and standard deviations even though each of the subgroups has a different number of subjects.

Other Programs Needed: OS/8, 8K FORTRAN
Storage Requirement: 8K
Source Language: FORTRAN

DECUS NO. 8-705

ARNORM: Area Under Normal Curve

Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

ARNORM is a function subroutine designed to compute the area under a normal curve in terms of Z standard deviations.

Other Programs Needed: OS/8, 8K FORTRAN
Source Language: FORTRAN

DECUS NO. 8-706

BITSET

R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

A set of three 8K FORTRAN function subprograms to permit the user to examine and/or set individual bits in a specified integer data word.

Other Programs Needed:	OS/8, SABR Assembler
Storage Requirement:	1 page
Restrictions:	Operates on integer data words only; uses EAE
Source Language:	SABR

DECUS NO. 8-707

CRSTAB: Cross Tabulation Program

L. G. Carter, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

CRSTAB is a cross-tabulation program for the analysis of survey type data. It permits the user to enter up to 9 responses to each of up to 60 questions. In conversational mode the user may indicate various tree-structure type combinations which are to be cross-tabulated. The maximum number of possible combinations is 2000 and the maximum number of responses on any combination is 2047. The tree structure may have up to 6 levels (from 2 to 6 questions may be cross tabulated at one pass).

Minimum Hardware:	PDP-8, Card reader, printer
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K
Miscellaneous:	Peripheral usage may be changed
Source Language:	FORTRAN

DECUS NO. 8-708

EMLP: Emory Linear Programming Package

F. W. Wood, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This is a small linear programming package intended for class demonstration use and/or linear programming problems of limited size. It has been adapted for the PDP-8, running under the OS/8 (or PS/8 or DECsystem-8) operating system, from a program originally written for the IBM 1620 by F. W. Wood of National Steel Corporation. This version includes some minor corrections and changes. Much of the description is taken directly from his original documentation. Additions, changes, etc. are by R. L. Jensen. The programming language used for this version is 8K FORTRAN for OS/8. Input/output options may have to be modified for a particular configuration.

Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or larger
Source Language:	FORTRAN

DECUS NO 8-709

FINCA: A Computer Program for Financial Statement Analysis

D. Eiteman, R. L. Jensen, G. Chalmers, M. Gordon & others

Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program analyzes commonly published financial data, giving three pages of commonly used ratios and gives plots of earnings per share, sales and dividends. Up to ten years of data may be handled in 8K of core, and the program may easily be expanded if more core is available.

Minimum Hardware:	PDP-8, Card reader, printer (may be modified)
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or larger
Restrictions:	Uses 132 col. printer or must be reformatted
Source Language:	FORTRAN

DECUS NO. 8-710

MULTS: Multiple Regression Program

J. Capato, R. L. Jensen, B. Watzman, C. Curran, G. Michel
Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program uses a least squares procedure to calculate the estimates of the partial regression coefficients in a multiple linear model. It provides several other statistics, permits extensive automatic transformation of data, and provides plots of user selected data.

Minimum Hardware:	PDP-8, Line printer to use plots
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or more
Miscellaneous:	Submitted for 12K or larger, but may be segmented for 8K system
Source Language:	FORTRAN

DECUS NO. 8-711

Microprocessor Cross Reference Program for OS/8

Robert Tedford, Digital Equipment Corporation, Marlborough, Massachusetts

MXR8 is a cross reference program which operates on output from MLA8, the Microprocessor Cross-Assembler. It is written in PAL8 and runs under OS/8. MXR8 aids the programmer in writing, debugging, and maintaining assembly language programs by providing the ability to pinpoint all references to a particular symbol.

Minimum Hardware:	OS/8 System, DECtape or Disk Pack
Storage Requirement:	8K
Restrictions:	All characters after the first semi-colon in a statement will be ignored. Characters appearing after the first set of delimeters in a TEXT statement will be treated as a user symbol
Source Language:	PAL-8

DECUS NO. 8-712

IRSPEC: Calculation "On Line" of Far Infrared Spectra by Fourier Transform

M. Boniface, J. P. Huvenne, B. Boniface, Laboratorie de Physique et Mathematiques, U.E.R. de Pharmacie, Lille, CEDEX, France

IRSPEC enables the on-line acquisition of the signal given by a far-infrared Michelson Interferometer. It, simultaneously, computes the data Fourier transform after apodisation and displays the results. Many calculation loops, using all the data points every time, allow the user to observe the spectrum evolution and eventually to stop acquisition.

As soon as the wanted data have been completed (max. 2048) IRSPEC computes the final coefficients of spectrum (max. 200) and displays permanentiy the result which can then be printed or plotted. A reference spectrum can be stored to compute, from a sample spectrum, transmission (I/I.) or absorbance (log (I./I)).

Documentation for the program is written in French.

Minimum Hardware:	LAB 8/E with 8K
Other Programs Needed:	EAE, FPP
Restrictions:	FPP must be entered before IRSPEC
Source Language:	PAL III

DECUS NO. 8-713

FORTRAN Plotting Subroutines

Gregory R. Ruth, Charles Stark Draper Laboratory, Cambridge, Massachusetts

A collection of SABR coded routines (callable from 8K FORTRAN) that provide a comprehensive plotting capability for PDP-8's equipped with a Calcomp 565 plotter (either "encoded" or "unencoded") or equivalent. The functions provided cover pen movement, plotting character strings, plotting floating point numbers (with rounding), setting up a coordinate grid in an 8 1/2 " X 11" space, and plotting points in that coordinate space.

Minimum Hardware:	Standard OS/8 configuration, Calcomp 565 plotter
Other Programs Needed:	OS/8 Loader (relocatable)
Storage Requirement:	2 to 13 pages
Source Language:	SABR

DECUS NO. 8-714

PDPLST: PDP-8 - IBM 360/370 Cross Listing Program

R. E. Stickel, Jr., University of Kentucky, Lexington, Kentucky

PDPLST is an interface program which provides IBM 360-370 listings and-or decks of programs prepared using the DEC-08-ESAB PDP-8 Editor and dumped as core images onto IBM compatible magnetic tape. PDPLST is compatible with the SYSMON monitor system.

Minimum Hardware:	IBM compatible magnetic tape drive
Storage Requirement:	12K IBM Bytes
Source Language:	360/370 Assembly

DECUS NO. 8-715

F4 GRAPHICS

Dennis McGhie, Stanford Medical Center, Stanford, California

This is a set of four subroutines which allow plotting under OS/8 FORTRAN IV. Included are subroutines for driving a plotter (XY12 or VP8/I) or buffering plotter commands to a file in a format compatible with PLOTVS (DECUS NO. 12-157). Entries are also provided for automatic scale setting, character plotting, and string plotting. The character and string routines are written in FORTRAN. The pen move routines are written in RALF.

Minimum Hardware:	Mass storage (min. OS/8, Disk is recommended for F4)
Other Programs Needed:	OS/8 FORTRAN IV
Storage Requirement:	8K
Source Language:	FORTRAN IV and RALF

DECUS NO. 8-716

Exponential Functions

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program runs on the Microprocessor (MPS) and contains some useful subroutines, double precision multiply, double precision add and binary to decimal conversion (both integer and fraction). e^X is calculated for nine stored values of X. The source program is written in the Microprocessor Assembly Language.

Minimum Hardware:	MPS Microprocessor
Storage Requirement:	1K
Source Language:	MLA

DECUS NO. 8-717

F4EAE - EAE OVERLAY FOR FRTS

Phillip D. Siemens, Lawrence Livermore Laboratory, Livermore, California

This collection of arithmetic routines overlays FRTS (DEC-S8-LRTSA-A-PS 5/73) in the OS/8 FORTRAN IV system. It enables a PDP-8/I (or classic PDP-8 with conditional assembly) to utilize its EAE option. Approximately a 20% increase in overall execution speed can be obtained with this overlay.

Minimum Hardware:	8K PDP-8/I, EAE, Mass Storage
Other Programs Needed:	OS/8 FORTRAN IV 'FRTS'
Source Language:	PAL-8

DECUS NO. 8-718

NSD - Nominal Standard Dose

Pei-nan Tsung, Ph.D., The Buffalo General Hospital, Buffalo, New York

This program furnishes the result of calculating nominal standard dose values for complex treatment schedules which allow changing in fractionation pattern per week and up to two consecutive split course radiotherapy.

Minimum Hardware:	8K OS/8 System
Source Language:	FORTRAN

DECUS NO. 8-719

OS/8 Software for a TC58 Magtape Control

W. Kenneth Patton and Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of three programs which extend the input/output capabilities of system, user, and 8K FORTRAN programs in OS/8 to include the TC58 magnetic tape. The first is a TC58 device handler (2 page, non file-structured) that includes six special function calls and can use any desired tape recording format. The second is a set of nine SABR subroutines (FORTRAN-callable) that provide formatted and unformatted tape input/output and special functions (endfile, spacing forward and reverse, rewind). The third is a SABR main program which allows the operator to position and write EOF marks on a tape, dump records in octal, and write test data.

Minimum Hardware:	TC58 Magtape Control, TU20 or equivalent; Tape Drives (up to 8; any combination, 7 or 9 track)
Other Programs Needed:	OS/8, 8K FORTRAN System, PAL-8, BUILD
Storage Requirement:	8K
Restrictions:	No EOF written to close tape files. Does not use TC58 Continue mode
Source Language:	PAL-8, SABR

DECUS NO. 8-720

LSTDMP: Binary Tape Dump/Lister

Mark Jaffe, General Electric Company, Ocean Sciences Lab., Philadelphia, Pennsylvania

This is a modification of DECUS 8-533 which enables the program to function as a mini-disassembler or a "binary tape dump" program, depending on switch options.

The program will recognize and print field settings; no attempt is made to decode instructions, however.

Minimum Hardware:	4K PDP-8/E, TTY; HSR/HSP optional
Restrictions:	Operates ONLY on PDP-8/E
Source Language:	PAL III

DECUS NO. 8-721

LISP - 8K

Marton Zsenei, Central Research Institute for Physics, Budapest, Hungary

This is an 8K version of the LISP Interpreter (see DECUS No. 8-102a). Only the differences are given in the documentation so it would be well to request the 8-102a write-up as well.

Minimum Hardware:	8K PDP-8, TTY, HSR/HSP
Source Language:	PAL III

DECUS NO. 8-722

Mini-Copy

Philip Hunt, Middletown TWP. High School, Middletown, New Jersey

This program when loaded and started at 00200 will accept data, either Binary or ASCII from the high speed reader, a character at a time and send it out to the low speed punch on the ASR33 teletype.

Other Programs Needed: Bootstrap Loader
Source Language: PAL-D

DECUS NO 8-723

Function Comp.FT

R. L. Jensen, Emory University, Atlanta, Georgia

An 8K FORTRAN function subprogram designed to compare two A6 fields for proper collating sequence and/or identity matching.

Minimum Hardware: PS/8 or OS/8 Operating System
Other Programs Needed: 8K FORTRAN
Source Language: FORTRAN/SABR

DECUS NO. 8-724

Computer Catalog System

Preston M. Crabill, Lehigh University, Bethlehem, Pennsylvania

These three FORTRAN programs were prepared to enable better accessibility to catalog files and to allow speedier information retrieval.

The WRITE program is set up to allow an operator to place catalog information on a specified file. The catalog information includes: catagories (a means of easy cross reference), vendor names, and key words pertaining to the vendor's catalog.

The MODIFY program enables an operator to ask for a specific reference number and modify it to his liking.

The SEARCH program allows easy information retrieval. Key words, vendor names, or catagories may be searched, and all of the information under pertinent reference numbers will be printed out on the teletype.

Minimum Hardware: OS/8 Configuration with teletype and two DECtapes
Source Language: FORTRAN and SABR

DECUS NO. 8-725

The Pipe Stress Problem on a PDP-8/F

Theodore E. Bridge, 54 Williamsburg Drive, Springfield, Massachusetts

This program may be used to calculate thermal expansion stresses in piping systems. It can handle multi-anchor systems with as many as 15 anchors. The program comes in two overlays. The first will edit and verify the input data, and draw a crude picture on the teletype to verify the geometry. The second will calculate stress and displacements at every point.

Minimum Hardware: 4K PDP-8/F, ASR33
Other Programs Needed: 3 Page Floating Point Package (DECUS 8-375B)
Source Language: PAL

DECUS NO. 8-726

An OS/8 Handler for the Varian Statos 21 Line Printer

Ernest M. Stokely, University of Texas Health Science Center, Dallas, Texas

A two-page, OS/8 compatible handler for the Varian Statos 21 electrostatic line printer. The handler has been incorporated into the OS/8 monitor system and used for several months without problems.

Minimum Hardware: OS/8 Configuration, Varian Statos 21 Line Printer
Other Programs Needed: OS/8 Monitor System
Storage Requirement: 8K
Restrictions: For rolled paper; handler ignores line feeds; vertical tabs must use optional hardware stops
Source Language: PAL-8

DECUS NO. 8-727

Disassembler

Jeff Nisler
Submitted by: Doris J. Stoudenmire, Walt Whitman High School, Huntington Station, New York

DISASSEMBLER is used to translate binary tapes to readable mnemonic symbols. It is a stand alone which may be used in a monitor system. Output is in two forms: 1) a source tape listing; 2) a pass 3 listing. A paging option is also available, as well as an option for HSR/LSR.

Minimum Hardware: 4K PDP-8; ASR33; Option for PCØ8 Reader
Source Language: PAL III

DECUS NO. 8-728

MEND

Jeff Nisler
Submitted by: Doris Stoudenmire, Walt Whitman High School, Huntington Station, New York

MEND gives options in copying, mending, and patch inserting with system tapes. It may be used alone or in a monitor system. More than one option may be requested during program execution.

Minimum Hardware:	4K PDP-8, ASR33, PCØ8
Source Language:	PAL III

DECUS NO. 8-729

DS340 DEMO Package

Business Products Group, Digital Equipment Corporation
Submitted by: Gene Naddeo, Digital Equipment Corporation, Maynard, Massachusetts

The demonstration programs contained in this package range from data entry and generalized bookkeeping to a calendar program. Although complete in themselves, these programs should not be considered a complete application package since they do not have the support programs needed to maintain the data files.

To insure accessibility to any COS300 user regardless of input media, the actual program material should be requested directly from Mr. Naddeo of DEC's Business Products Group. Distribution fees will be compatible with DECUS Service Charges.

Minimum Hardware:	PDP-8, VTØ5, LS8E, RKØ8 or RK8E
Other Programs Needed:	COS300 Operating System
Storage Requirement:	12K
Source Language:	DIBOL

DECUS NO. 8-730

CORVU: A Display and Teletype Input/Output Program

F. G. Oakham, University of Toronto, Toronto, Canada

CORVU allows the user to examine and modify the contents of core of a PDP-8/E via the TTY in a manner similar to ODT. It can also display in octal form the address and contents of up to 128_{10} locations on a model 601 Tektronix storage oscilloscope. It operates under interrupt, and the basic program (not including interrupt and a dummy background program or options) occupies only three pages of core (7000_8-7611_8). Thus it is ideal for use with a large background program when core space is at a premium. A non-store option MOV1 is also available.

Minimum Hardware:	Essential: PDP-8/E, ASR33, Tektronix 601 scope (or equivalent). 3 channels A to D (program could probably be adapted for use with VC8-E) Useful: Relay output to operate erase, EAE and two D to As.
Storage Requirement:	0-5, 6200-7611 for stand-alone program
Source Language:	PAL

DECUS NO. 8-731

MEMO IV

Gregory Ruth, Charles Stark Draper Laboratory, Cambridge, Massachusetts

MEMO IV is a program written for the OS/8 system to produce right- and left-justified paged text from free form text. The intention is to permit the user to produce a readable and neatly formatted document with minimal effort. This is a descendant of earlier programs MEMO and MEMO II (DECUS No. 8-427a - Removed). This version adds several new features, most notably the capability for directing output to any OS/8 compatible device (rather than restricting it to the teletype. Files written for previous versions of MEMO are compatible with MEMO IV.

Minimum Hardware:	OS/8 Configuration
Storage Requirement:	$0 - 5377_8$
Source Language:	PAL-8

DECUS NO. 8-732

BAVIRF - A Virtual File UDEF for OS/8 BASIC

Stanley R. Vivian, University of Manitoba Faculty of Medicine, Winnipeg, Canada

This overlay to OS/8 BASIC permits random access to the data in up to four numerical files - which may be of fixed or variable length. The maximum file length can contain 170,080 floating point numbers. The two functions, GET(F,L) and PUT(F,L,V), will retrieve, or deposit a value V, from or into location L of file F. Variable files are automatically expanded as needed. Users may switch from random to sequential access and vice versa. Full error checking is included to diagnose attempts to: access idle or non-numeric files; GET or PUT beyond the end of file; and, access data not within locations 1 to 170,080.

Minimum Hardware:	OS/8 Configuration
Other Programs Needed:	OS/8 BASIC V3
Storage Requirement:	300_8
Source Language:	PAL-8

DECUS NO. 8-733A

PDP-8/E RJE System (IBM 278Ø Emulator)

University of Iowa Computer Center
Submitted by: William F. Decker, University of Iowa, Iowa City, Iowa

This program is designed to simulate an IBM 2780 communicating with an IBM 360/370 system running IBM OS/HASP software. The PDP-8/E RJE package currently supports a card reader, line printer, papertape reader punch, synchronous line unit and cyclic redundancy check option.

Characteristics of the software include: EBCDIC transmission code; Horizontal format record processing for printing; Multiple record buffers; Papertape reader/punch support; Transparency for transmission or reception.

The PDP-8/E RJE terminal can support several local functions such as: card-to-printer, printer-to-papertape, papertape-to-printer and papertape-to-papertape operations.

Minimum Hardware:	PDP-8/E, DK8EA, CR8F, LE8, DP8EA, KG8EA, LA36 (PC8E Optional)
Optional Hardware:	Any OS/8 configuration. NOTE: The PDP-8 Remote Job Entry System is not supported under OS/8. However, this hardware is only needed to modify the source DECtape provided.
Optional Software:	OS/8 (Needed to reassemble source.)
Storage Requirement:	8K
Source Language:	PAL III

DECUS NO. 8-733B

Software Support Manual for PDP-8/E RJE System

University of Iowa Computer Center
Submitted by: William F. Decker, University of Iowa, Iowa City, Iowa

This manual offers support material for the program described above.

DECUS NO. 8-734

Microprocessor Language Assembler for OS/8

Robert Tedford, Digital Equipment Corporation, Marlborough, Massachusetts

This program is written in PAL-8 and requires the OS/8 operating system. It is a modified version of MLA, the cross-assembler for DEC's Microprocessor based on the Intel 8008 chip.

Minimum Hardware:	OS/8 System, DECtape or Disk Pack
Storage Requirement:	8K
Restrictions:	In a direct assignment statement, the equal sign must be the symbol delimiter
Source Language:	PAL-8

DECUS NO. 8-735

DSP8; Diagnostic Support Package for the PDP-8

John C. Alderman, Jr.; Gwen N. McAllen
Submitted by: William H. Posey, Digital Communications Associates, Inc., Atlanta, Georgia

DSP-8 is a collection of useful subroutines and conventions for programming a small computer (the PDP-8 family, in this case), which specifically facilitates the task of the diagnostic programmer in creating diagnostics to test hardware peripherals for the system. Some considerable thought has gone into the writing of the specifications for the components of this package, and the experience of the authors in writing maintenance diagnostic is the major basis of the choice of available elements of this package.

Because the DSP8 source can only be assembled by a PS/8 or OS/8 configuration, the ASCII paper tape offered is for DSP8P, a PAL3 assemblable source file for smaller configurations.

Minimum Hardware:	Teletype required for users at I/O facilities
Storage Requirement:	1600 words maximum
Source Language:	PAL-8

DECUS NO. 8-736

Paper Tape Reader-Printer

W. E. Hamilton, 212F Red Oak Drive East, Sunnyvale, California

This is a utility used to "dump" the contents of an ASCII coded paper tape. The teletype is used for both input and output, however the high speed reader and/or a special Centronics printer may be used.

Codes such as "Line Feed," "Space" and "Rub Out" will be printed as "LF," "SP" and "DEL" respectively. PTRP does not actually execute the data being read in, thus it gives an "honest" indication of what is "really" on the tape.

Minimum Hardware:	ASR33 High Speed Paper Tape Reader (optional)
Source Language	PAL III

DECUS NO. 8-737A

Four Word Floating Point Package for MPS

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This package is a 4-word floating point system for MPS, Digital Equipment's Microprocessor based on the Intel 8008 chip.

The basic operations included in this package are GET, PUT, ADD, SUBTRACT, MULTIPLY, DIVIDE, NORMALIZE, INPUT, OUTPUT, NEGATE and FIX. Extended functions are described in the companion package (DECUS 8-737B).

Minimum Hardware:	MPS
Other Programs Needed:	User program
Restrictions:	Block 23 must be RAM
Source Language:	PAL-8

DECUS NO. 8-737B

Four Word Floating Point Functions for MPS

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This function package was written for use with the Four Word Floating Point for MPS (DECUS 8-737A) and includes subroutines to evaluate square, square root, sine, cosine, arctangent, natural logarithm and experimental functions.

Minimum Hardware:	MPS
Other Programs Needed:	DECUS NO. 8-737A
Source Language:	PAL-8

DECUS NO. 8-737C

Rudiementary Calculator for MPS Four Word Floating Point Routines

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This is a minimum space program to perform calculations with the precision of the Four Word Floating Point Package for MPS (DECUS 8-737A) and to use the Four Word Floating Point Function Package (DECUS 8-737B). Operations are performed in the sequence in which they are entered. Up to seven user-defined operation routines may be called.

Minimum Hardware:	4K MPS, ASR33
Other Programs Needed:	DECUS 8-737A and DECUS 8-737B
Storage Requirement:	1K
Source Language:	PAL-8

DECUS NO. 8-738

The Business Management Laboratory

R. L. Jensen, Emory University, Atlanta, Georgia

The Business Management Laboratory is a medium to large scale management game intended for use in schools or management training programs. It permits 3-8 teams (firms) to compete in a consumer durables market, while they make decisions in the areas of marketing, finance, production and accounting control. The degree of complexity can be controlled, so that the game has been used in introduction to business courses as well as graduate policy courses.

The program is provided in FORTRAN IV source form only. The complete DECtape includes the simulation program (as several subroutines), test and set-up data, several auxiliary programs, and compiling/implementation instructions.

Minimum Hardware:	OS/8 or DECsystem-8
Other Programs Needed:	Information concerning availability of participants' and administrators' manuals are included with the write-up
Storage Requirement:	16K
Source Language:	FORTRAN IV

DECUS NO. 8-739

COPY.PA

Glen L. Brydon
Submitted by: John W. Cowan, Glen Ridge High School, Glen Ridge, New Jersey

This OS/8 device handler allows OS/8 users with one TD8E DECtape drive as their system device to easily move files from one tape to another using OS/8 system programs such as PIP. COPY provides the single-DECtape user some of the power of multiple-DECtape systems, at the expense of some time and effort changing tapes. It insures the integrity of transfers through an error recovery system which allows retries to be ordered if the handler was unable to read a damaged tape.

Minimum Hardware:	PDP-8/M, TU56H with TD8E
Other Programs Needed:	OS/8 monitor
Storage Requirement:	1 page handler
Restrictions:	Limited error recovery
Source Language:	PAL-8

DECUS NO. 8-740

Theorem Prover for the Propositional Calculus

Dr. A. K. Head, C.S.I.R.O. Division of Tribophysics, University of Melbourne, Parkville, Australia

This is a complete LISP program with examples which runs under PDP LISP (DECUS 8-102a). It considers proposed theorems in the propositional calculus and decides if they are true or false. It is based on the Wang algorithm and

DECUS NO. 8-740 (Continued)

offers a choice of trace print out of steps involved in proving or disproving a theorem.

Minimum Hardware:	4K PDP-8 & Teletype
Other Programs Needed:	DECUS 8-102a
Source Language:	LISP

DECUS NO. 8-741

SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape

W. van der Mark, Swiss Federal Institute of Technology, Zurich, Switzerland

This package consists of two handlers to be inserted via BUILD.SV into the OS/8 V3 operating system. They are a replacement for the resident and non-resident TD8E DEC handlers. Both handlers will run with the interrupt switched on and will permit a data acquisition rate of 50 CPS.

Minimum Hardware:	PDP-8/E, M, F, A with TD8E simple DECtape (12K if no disk)
Other Programs Needed:	OS/8 V3 operating system (Can be modified for older BUILD.SV versions
Storage Requirement:	Both handlers are two-page
Restrictions:	MQ register is used
Source Language:	PAL-8, V9B

DECUS NO. 8-742

CLOCK - A Real-Time Clock/Calendar Routine

P. K. Hastings and L. R. Tilley, Catalytic, Inc., Charlotte, North Carolina

A clock/calendar routine for keeping track of time in PDP-8 computers. This routine keeps up with minute, hour, day, month and a year. It was designed to be used with a real-time clock.

Minimum Hardware:	PDP-8 with Real-Time Clock
Other Programs Needed:	Interrupt Service Routine
Source Language:	PAL III

DECUS NO. 8-743

FILFIX - TSS/8 File Structure Repairing and Restructuring Program

Richard Wilson, Digital Equipment Corporation, Maynard, Massachusetts

FILFIX is a stand-alone utility program which analizes, repairs and restructures the files of any standard TSS/8 configuration. FILFIX enables a TSS/8 system to be rebuilt without losing the previous contents of the library on the system disk, and is also capable of correcting certain types of errors in the directory.

Minimum Hardware:	PDP-8, 8/I, 8/E
Other Programs Needed:	TSS/8 Operating System
Storage Requirement:	12K
Source Language:	PAL-8

DECUS NO. 8-744

TSTCDR - TSS/8 Card Reader Diagnostic

Richard Wilson, Digital Equipment Corporation, Maynard, Massachusetts

This is a TSS/8 card reader diagnostic which is designed to run under TSS/8, version 8.24. The diagnostic makes use of standard alpha and binary test decks, either 40 or 80 column.

Minimum Hardware:	PDP-8, 8/I or 8/E with card reader
Other Programs Needed:	TSS/8
Storage Requirement:	12K
Source Language:	PAL-8

DECUS NO. 8-745

LEP - Linear, Exponential and Power Function Curve Fit

Pei nan Tsung, Ph.D., The Buffalo General Hospital, Buffalo, New York

Curve fitting for straight line, exponential curve fit, power function fit and e-exponential curve fit. The sample size of ordered pairs (x_i, y_i) is 30. All the calculations are based upon the method of least squares.

Minimum Hardware:	8K OS/8 System
Source Language:	FORTRAN II

DECUS NO. 8-746

Device Handler for Tektronix 611 Storage Scope

Shlomo Z. Ron, New York City Health and Hospitals Corp., New York, New York

KV is a four page read and write non-file structured device handler under the OS/8 operating system. Since only 2 pages are allowed for an OS/8 device handler, the other two pages have to be in core in any 2 consecutive pages which are not destroyed by the program that uses this device handler.

Minimum Hardware:	PDP-8/E, KV8E and storage scope
Other Programs Needed:	OS/8
Storage Requirement:	2 pages besides the device handler
Restrictions:	Can be used if program does not destroy 2 consecutive pages in any memory field
Source Language:	PAL-8

DECUS NO. 8-747

STAGE2 MACRO Processor

Jonathan Gross, SSRFC, University of Minnesota, Minneapolis, Minnesota and W. M. Waite, EE, University of Colorado, Boulder, Colorado

STAGE2 is a general purpose macro processor designed by W. M. Waite, and may be used as a front end to other languages such as SABR, FORTRAN and BASIC. Device independent I/O, and access to several files allows for flexible processing and multiple passes within the macro processor. Macro calls are recognized by a pattern matching scheme that allows for flexible syntax in macro definition. The special characters controlling the macro processor may be easily defined so that they do not interfere with the host language. Handles upper and lower case, and control characters. STAGE2 is itself written in a language (FLUB) that is translated by STAGE2 into PAL-8.

Minimum Hardware:	Will run only on PDP-8/E, F or M with EAE
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	12K to 32K
Restrictions:	All macros must be defined at beginning of source code
Source Language:	PAL-8, STAGE2 (FLUB)

DECUS NO. 8-748

SMØ4 - OS/8 to Disk-Monitor ASCII File Converter

Gerald A. Sabin, 6022 Sage Drive, Orlando, Florida

SMØ4 will be found useful by regular users of DEC's Disk Monitor. It is a utility program that will convert an ASCII file on an OS/8 DECtape reel into an ASCII file on Disk-Monitor DECtape. User needs to know the absolute block numbers of his input OS/8 ASCII file. SMØ4 will output, via Disk-Monitor, into a file named by the user.

SMØ4 is written in FORTRAN-D and uses a number of FORTRAN tricks that have appeared in DECUSCOPE over the last few years to accomplish the required machine language subroutines.

Minimum Hardware:	4K PDP-8, 2 DECtape transports, TTY
Other Programs Needed:	Disk-Monitor System
Source Language:	FORTRAN-D

DECUS NO. 8-749

UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined-Functions for OS/8 BASIC

Stanley R. Vivian, University of Manitoba Faculty of Medicine, Winnipeg, Manitoba, Canada

The standard LAB-8/E user-defined-functions distributed with OS/8 BASIC, V3, have been modified to function on the original LAB-8 (PDP-8 with AX08 laboratory peripheral). The general philosophy of these modifications has been to make them in such a way that programs that run on the LAB-8/E will also run on the LAB-8 (AX08) without changes. The functions, their argument structures and execution logic are essentially the same as in the LAB-8/E version as documented in the OS/8 Handbook - DEC-S8-OSHBA-A-D.

Major differences are: 1) CLK - prints setting of RC clock; 2) SAM - will not sample digital registers; 3) DRI - reads contingency bits; 4) DRO - sets or clears digital outputs.

Minimum Hardware:	OS/8 Configuration with AXØ8 Laboratory Peripheral (options XR, XC, XM)
Other Programs Needed:	OS/8 BASIC V3 (or V1)
Storage Requirement:	3400-4577
Source Language:	PAL-8

DECUS NO. 8-750

Paper Tape Display

Thomas Ford
Submitted by: Jeffrey A. Merrow, White Mountains Regional High School, Whitefield, New Hampshire

This program, designed for display purposes, was originally produced by Thomas J. Ford using FOCAL 5/69 and will type each tape punch as six characters long, and four high, except for the sprocket holes, which are four characters long as well as high.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	2ØØ-363

DECUS NO. 8-751

FORTRAN IV for OS/8 FORTRAN II Users

John Cowan, Glen Ridge High School, Glen Ridge, New Jersey

FORTRAN IV for OS/8 FORTRAN II Users is a manual of implementations and subroutines simulating most of the features of standard and OS/8 FORTRAN IV, with the exception of double-precision routines. These routines will not work under the paper tape FORTRAN. INVENT-8 (DECUS8-610) and DPARITH (DECUS 8-597.12) are assumed: that is, they are not used, but features they provide have not been duplicated.

Minimum Hardware:	8K OS/8 System
Other Programs Needed:	OS/8 FORTRAN II
Restrictions:	Not source compatible with OS/8 FORTRAN IV; Double precision not implemented; Complex numbers not yet implemented
Source Language:	FORTRAN II, SABR

DECUS NO. 8-752

MIG8E2 - Monitor of Interruptions Which are Generated by the PDP-8/E Peripherals

Alain Beysen, SNECMA, Centre de Etudes de Villaroche, Moissy Cramayel, France

This general purpose program will handle the priority scheduling of different I/O devices, with a minimum of disturbing time. It provides: hardware and software interrupts, 12 levels of priority plus background plus interrupt off, saving all active registers (including arithmetic and memory extensions) plus one memory, loading in 3 pages of core plus 16 memories page Ø in field Ø, queuing low levels of priority, masking interrupts if wanted, high speed servicing -- and no bugs -- hopefully.

Minimum Hardware:	4K PDP-8/E with interrupt facilities
Miscellaneous:	Documentation and listing comments are in French
Source Language:	PAL III or PAL-8

DECUS NO. 8-753

OS/8 System Output Handlers

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This package contains three two-page handlers and a program which accepts one input file and types it simultaneously on devices 04 (console) and 41 (commonly the first extra TTY or DECwriter). Two of the handlers were written for a console teletype or DECwriter; the third for the LS8E Centronix matrix printer.

Minimum Hardware:	8K OS/8 Configuration
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-754

NUMBER and REDATE - OS/8 File Utility Programs

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

These programs help to facilitate the handling of certain OS/8 files that are in some way peculiar, e. g. in having no file date or a bad file date, or in containing illegal characters in name or extension.

Minimum Hardware:	PDP-8/E or later
Other Programs Needed:	OS/8
Storage Requirement:	8K
Restrictions:	NUMBER of use mainly to OS/8 V3 and later
Source Language:	PAL-8

DECUS NO. 8-755

OCTYPE - Octal Memory Dump

Jeffrey A. Merrow, White Mountains Regional High School, Whitefield, New Hampshire

OCTYPE's purpose is to output specified blocks of memory as: The current location, followed by: data located there. Input is from the teletype keyboard or low speed reader. The program will halt after each block is printed, but can be recovered by pressing CONT.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	PAL III

DECUS NO. 8-756

ASCON - ASCII File Converter

Steven Zimmerman, Boston V. A. Hospital, Department of Nuclear Medicine, Boston, Massachusetts

This program takes a standard 64 character ASCII file of the type produced by EDIT and translates it into a 96 character ASCII file. It is primarily intended for taking text which is all upper case and translating it into standard upper and lower case, usually for eventual output to a line printer.

ASCON is particularly powerful in combination with MEMO IV (DECUS 8-731).

Minimum Hardware:	PDP-8, PDP-12
Other Programs Needed:	OS/8
Storage Requirement:	8K
Miscellaneous:	LINCtape offered contains binary, ASCII, Save, listing and write-up files
Source Language:	PAL-8

DECUS NO. 8-757

OS/8 Utility Package

A. Windram
Submitted by: L. C. Chapas, The Grasslands Research Institute, Hurley, Maidenhead, Berkshire, England

This package consists of the following programs:

CORMAP - will produce a map for binary files showing where they load in memory. It is an alternative to OS/8 BITMAP, and offers more concise output and additional facilities. Both absolute and relocatable binary files can be mapped.

FORMAT - allows program tapes to be prepared off-line, and then converted to a standard on-line format. Strings of spaces are replaced by tab characters in a more intelligent way than EDIT, and some reformatting is done.

FIXCD - one-time program to fix several known bugs in Command Decoder (PS/8 and OS/8 V1 and V2 only).

DECUS NO. 8-757 (Continued)

XDIREC - selectively lists files by file-names or extensions. Options allow listing of up to 8 additional information words, listing of core-control blocks for core-image files, and listing of FORTRAN II library directories.

FHANDL - allows file-handling in normal or special mode of Command Decoder, using block-, word-, or character-oriented transfer, with the ability to handle several input and output files simultaneously.

F2SUB - the first 5 modules will run on any PDP-8 processor. The 6th requires a PDP-8/E, and the 7th a PDP-8/E with EAE.

1. MOVE - Allows moving or zeroing of real or integer arrays be means of a single subroutine call instead of a DO loop. Needs 1 page.

2. MKRSET - Gives direct-access handling for Stream 4 input. Needs 1 page.

3. ICARD - A routine for reading cards in binary. Needs 1 page.

4. UTIL - This is the OS/8 V1 UTILITY module, with an in-core encode/decode facility added. Binary only. Needs 4 pages.

5. FFFINP - Free-format input package for numeric and character input, and character comparison, using any stream. Needs 5 pages.

6. RWIOH - This is the OS/8 V1 READ/WRITE/IOH module, modified to output even-parity characters. Binary only.

7. LOGIC - Provides 9 logic functions (AND, OR, NOT, SIDE-ADD, SHIFT-LEFT, SHIFT-RIGHT, SET BIT, CLEAR BIT, TEST BIT). Needs 1 page.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	OS/8 PS/8
Source Language:	PAL-8; SABR for F2SUB

DECUS NO. 8-758

Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E

Ricky Schrieber/Charles Lasner (P?S), Forest Hills, New York

Due to the hardware implementation of the MI8E bootstrap loader, it is necessary for the option to ground PWR NOT OK to cause a power clear sequence. On the RK05's this causes the heads to retract in case of a real failure, so to cover up for this and to leave a message logged on the console TTY a hack was made to have it type INITIALIZING then wait for the drive and do a standard OS/8 RK8E bootstrap.

Well, here is one for the TC08/TC01 that will rewind unit 0, print the message INITIALIZING and then proceed to bootstrap to what looks like a standard TC01 bootstrap.

Minimum Hardware:	PDP-8/E/F/M; TC08/TC01; MI8E
Restrictions:	Might fail MI8E diagnostic due to self-modification
Source Language:	PAL

DECUS NO. 8-759

USLIBA - FORTRAN II Subroutines for Binary Data Transfer

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

USLIBA contains five SABR-written subroutines which are useful on evaluating absolute integer binary data in FORTRAN II.

DATAM prints the OS/8 date, ADFAC helps users with an A/DC to evaluate their conversion factor: A/DC integer value to real voltage, DCHAN stores integer data from DF 2 into the "COMMON" area in DF1, ADCOM combines ADFAC and DCHAN, storing the real voltages of integer A/DC values from DF 2 into the COMMON area in DF 1, RDATA finally reads integer data from the OS/8 SYS device from a file into core. These data files can be created by means of another program also available from DECUS: "WDATA" - DECUS 8-761.

Minimum Hardware:	OS/8 Configuration
Other Programs Needed:	Recommended: WDATA - DECUS 8-761
Storage Requirement:	The 5 routines each need from 1 to 3 pages
Source Language:	SABR

DECUS NO. 8-760

FASTAD - User Oriented Data Collection on One A/DC Channel

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

FASTAD is a program for user-oriented data collection on one A/DC channel with one big buffer. Up to 4K core can be filled with A/DC samples.

FEATURES:

Start of measurement by TTY, Schmitt triggers (of DK8-EP), or external Clock input A/DC at maximum speed (ca 40.7 [KHZ]), Clock determines the sampling frequency with a maximum error of ± one [HZ].

A/DC with the Clock controlling the sampling frequency from a ca 34 [KHZ] to arbitrary slow rates.

A time delay after trigger start and before A/DC start can be chosen

DECUS NO. 8-760 (Continued)

In a thorough dialogue-and test-part the user can select his choice of the offered possibilities, test and calibrate the input signals, triggers, etc. After the measurement has been finished the user can have a test output of selected buffer points on the terminal (user determines selection) and repeat his special choice of measurement without a new run through the long dialogue-and test-part.

By means of WDATA (DECUS8-761) the OS/8 user can store his data on files on the SYS-device and by means of USLIBA (DECUS 8-759) he can evaluate these data in FORTRAN II programs very comfortably.

The buffer and A/DC program parts can be changed easily: the Write-up contains the necessary help for other users to fit this program to their needs.

Requirements:	PDP-8/E with at least 8K core, 12K better; a Real Time Clock 'DK8-EP'; An A/D converter 'ADØ1-AP' or other A/DC types with multiplexer; OS/8 configuration are not necessary but an advantage
Software:	DEC's Floating Point Package (EAE or NON EAE) (DEC-8E-NEAEA-A-PB) or (-Ø8-NFPPA-A-PB); TTYIO(DECUS 8-762); For OS/8 users: WDATA(DECUS 8-761) and USLIBA (DECUS8-759) strongly recommended
Source Language:	PAL-8

DECUS NO. 8-761

WDATA - Subroutine to Write Absolute Binary Data on SYS-Device

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

WDATA is a subroutine for writing absolute binary data on the OS/8 SYS-device.

Format: sequential blocks of $400_8 = 256_{10}$ data each.

By means of 'USR' the user opens his data-file and then WDATA writes the buffer contents to the sys-device (start address, field, and length of buffer programmable). For subsequent calls to WDATA no new data-filename is necessary; WDATA keeps track of the block-numbers. Furthermore, it examines if the buffer length corresponds to an even number of pages, if the sys-space available is sufficient for the next buffer output (if not, a correction will be done of the amount of output together with a correction message), and it asks after a successful buffer-output if you want to transfer any more data. If your output has been ended it will print out the complete filename (with the extension ".EX") and its total block length.

Evaluations of these data having been stored on sys by WDATA can be made in FORTRAN II by means of the program USLIBA (DECUS 8-759).

Minimum Hardware:	OS/8 Configuration, at least one terminal and one mass storage device
Other Programs Needed:	USLIBA (DECUS 8-759)
Storage Requirement:	3 pages
Restrictions:	Minimum transfer unit: 2 pages = one OS/8 block of data; Data buffer should not occupy the USR area in core
Source Language:	PAL-8

DECUS NO. 8-762

TTYIO - I/O Routines for Teletype or Similar Terminal

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

This package contains programs necessary for a good communication with the terminal. TYPX prints messages, six bit ASCII.

KREAD reads messages from keyboard, GETBUF prints them out (both use a buffer for the eight bit ASCII characters) as a mere message or forms an octal number of sequential characters. DBCONV converts ASCII-coded decimals to binary numbers, DECPRT prints up to 4 digit decimal numbers of a binary number in AC.

HEAR is a special form of KREAD for a fix text buffer, GETKBD is the corresponding GETBUF for a fix buffer.

The routines require 2 pages of core and can be used field independent via some special routines listed in the comment. They all use the same exit (1 loc. in page Ø). KREAD, TYPS, DBCONV and DECPRT are adaptations from DEC's Commonly Used Utility Routines.

Minimum Hardware:	PDP-8/E, KL8E Interface (TTY, LA30 or LA36 interface)
Source Language:	PAL III

DECUS NO. 8-763

KL8TST - KL8/E, KL8/J Diagnostic

David A. Bennett, Computer Science Research Laboratory, The Technological Institute, Evanston, Illinois

KL8TST verifies the correct operation of a KL8/E or a KL8/J asynchronous serial device controller. In an environment where a particular board must quickly be isolated as the possible source of some unknown difficulty, or in general when a vote of confidence is needed on a KL8/E or /J irrespective of the peripheral which it controls, this program will give a fast go no/go response.

Should the program discover a fault, it attempts to report its nature in meaningful English language phrases. It will perform independent tests of 1) interrupt capability, 2) punch complete flag operation, 3) keyboard ready flag operation, and 4) data integrity.

Storage Requirement:	words 0-663 any field
Source Language:	PAL-D, PAL-8

May 1975

DECUS NO. 8-764

LIST

P, C. Diegenbach, Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands

This program gives a listing of an OS/8 file on the Tektronix 4010 terminal with optional hardcopies on the 4020 hardcopy device or on the teletype of DECwriter. Paging after a form feed is switch selectable too. Default extension for the file is .DA. It uses the PS8IN subroutine (DECUS 8-472) (PS8IN is included with the source).

Minimum Hardware:	OS/8 Configuration, Tektronix 4010 Display Terminal
Source Language:	PAL-8

DECUS NO. 8-765

DUMPOS - Dumps OS/8 ASCII Files

Melvyn George Fishel, Free University Brussels, Brussels, Belgium

Program DUMPOS is a very useful dump program in case of system or directory crashes with OS/8 DECtapes. DUMPOS will dump any OS/8 ASCII file on the ASR33, even if the system area or the directory has been destroyed. Block number of file to be dumped is entered manually via the switch register.

Minimum Hardware:	PDP-8/E, ASR33, TD8E DECtape
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	06600-07577
Source Language:	PAL-8, PAL III

DECUS NO. 8-766

SIMBA - A PDP-8/E Oscilloscope Symbol Generator

Melvyn George Fishel, Free University Brussels, Brussels, Belgium

SIMBA is a fast, two-page oscilloscope character generator. A 6X4 dot matrix is used to generate the symbols. The subroutine takes care of full-line, full-page and end-of-file conditions. Tab characters are automatically expanded.

Minimum Hardware:	PDP-8/E, EAE, VC8E, Oscilloscope
Storage Requirement:	2 pages (400_8 words)
Source Language:	PAL-8, PAL III

DECUS NO. 8-787

LISZ - An Extended ISZ Instruction for the PDP-8/L

J. S. B. Clark, Poultry Research Center, Edinburgh, Scotland

The write-up describes a hardware modification to the PDP-8/L which will allow a greater facility for bit manipulation than is possible with the standard instruction set. The modification extends the use of the ISZ instruction. An example shows the application of this LISZ instruction to a polarity-quantized algorithm, with a reduction of between 15% and 50% in execution time.

Hardware Required:	PDP-8/L or 8/I
Source Language:	PAL III, PAL-D
Restrictions, Deficiencies, Problems:	Involves a small hardware modification

DECUS NO. 8-788

Using the RAR RAL Micro-Instruction as an Auxiliary Command

J. S. B. Clark, Poultry Research Centre, Edinburgh, Scotland

The limited instruction set of the PDP-8/L can cause program inefficiency. A modification is described which allows the redundant micro-instruction RAR RAL to be used as a control command. An example of its use in enabling another modified command under program control is given.

Hardware Required:	PDP-8/L or PDP-8/I (unverified)
Source Language:	PAL III, PAL-D
Restrictions, Deficiencies, Problems:	Involves a hardware modification

DECUS NO. 8-789

RKCOPY

MARK D. Himes, Digital Equipment Corporation, Rolling Meadows, Illinois

RKCOPY is designed to facilitate copying entire disk packs between any two disk drives on an RK8E or RKS8E compatible disk system. In addition, verification of data copied is made possible as well as the capability of comparing any two disks for differences in data formats. Minimum core allocation and minimum execution time were the two main factors strived for in this program.

Monitor/Operating System:	Exits to OS/8
Core Storage Required:	0-1777 Field Ø (Field 1=buffer)
Hardware Required:	Console Device (TTY, VT05, LA30, etc.); PDP-8/E, F, M; RK8E or RKS8E
Other Software Required:	RIM, BIN Loaders, or OS/8
Source Language:	PAL-8, V9B
Restrictions, Deficiencies, Problems:	Requires 8K operating area, copies entire disk only (no partial transfers), not tested under COS 300 or other monitors

DECUS NO. 8-790

CHRDIS - Display Alphanumeric Characters on ND-50/50 System

Dipl. Phis. Mircea Pentia, Nuclear Education and Training Center, Bucharest, Romania

This program is an overlay for Physics Analyzer program (ND 40-1042). It is used to write and display the ASCII characters typed to the teletype keyboard, on the scope from the standard Series 50/50 Nuclear Data Analyzer. It is possible to display maximum 256 characters. (32 per line times 8 lines.)

Object Computer:	PDP-8/L
Core Storage Required:	8K
Hardware Required:	Nuclear Data 50/50 Interface System
Other Software Required:	Nuclear Data's Basic Software
Source Language:	PAL III

DECUS NO. 8-791

DELAY

J. Victor Nahigian, 39 Beaver Road, Weston, Massachusetts

When entering a tape via the low-speed reader in 8K BASIC or 8K FOCAL, characters are occasionally dropped. To avoid this, null characters must be inserted after each line in order to allow the computer to catch up. This program performs that function.

Core Storage Required:	4K
Hardware Required:	PDP-8, ASR33
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	Can't be used on high-speed reader or punch

DECUS NO. 8-792

PROVE-8, V.03

A. David Leach, 39 Irvine Drive, Farnborough, Hampshire, England

The art of Campanology, or church-bell ringing in the English manner, uses a traditional form of music based on mathematical rules. One of the rules is that no permutation of the bells may occur more than once in a composition. To prove this by hand can be a long, tedious process.

PROVE can handle compositions of up to 500 leads in any single-hunt method, plain or otherwise, on up to 12 bells.

June 1976

DECUS NO. 8-792 (Continued)

A composition is entered in the standard format on the teletype, and the PDP-8 interrupts to print the details of any repetition.

Core Storage:	4K
Hardware Required:	PDP-8, TTY or equivalent terminal
Other Software Required:	Bin loader
Source Language:	PAL-8

DECUS NO. 8-793

RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV

Jonathan Gross, University of Minnesota, Minneapolis, Minnesota

This is a FORTRAN IV random number function that returns a number in the range of Ø to 1. It is based upon the generator by Dunsby and Walker, DECUSCOPE, Vol. 14, Number 3. Also included is a seeding subroutine, RANSET.

Monitor/Operating System:	OS/8
Core Storage Required:	133 octal words
Hardware Required:	EAE
Other Software Required:	FORTRAN IV
Source Language:	RALF

DECUS NO. 8-794

IFAC - A FORTRAN Program for Parameter Estimation

Hans-Dieter Wierum, Institut fuer Kerntechnik
Technische Universitat Berlin, Berlin, Germany

This program consists of four source programs, IFAC, GAUSS, BINOM and PULSAD. The main program IFAC computes matrixes and vectors which are needed for a least squares analysis. The subroutine GAUSS solves a linear equation system, i.e. the matrix equation A.X=Y for X. The elements of the result vector X are the parameters of the discrete transfer function. The subroutine BINOM computes the vector PAR from the vector X. The elements of the vector PAR are the parameters of the continuous transfer function. The data acquisition of the input-and-output - signals is carried out in real time by the subroutine PULSAD.

Monitor/Operating System:	OS/8
Core Storage Required:	12K
Hardware Required:	AXØ 8, ASR-33
Source Language:	FORTRAN II, PAL-8 or PAL III

DECUS NO. 8-795

RINROT: A Roll-in, Roll-out Program

Wayne Teeter and Harold E. Cronin
Naval Weapons Center, China Lake, California

RINROT is a roll-in, roll-out program used to save an RK8E cartridge disk on TM8E 1/2" magtape or restore the disk from the magtape. A starting address of 0200 reads the disk and writes the disk data in 1024 word blocks on the magtape. A starting address of 0400 reads the magtape and writes 256-word blocks on the disk.

Monitor/Operating System:	OS/8
Core Storage Required:	Locations 20-2600
Hardware Required:	RK8E cartridge disk, TM8E magtape
Source Language:	PAL-8

DECUS NO. 8-796

Five Word Floating Point Package for PDP-8

Douglas L. Martin
National Research Council of Canada, Ottawa, Canada

The package operates in the interpretive mode, performing calculations with an accuracy of 14 to 15 significant digits. It includes input and output routines, the latter permitting variable word length fixed and floating point outputs. Input and output are possible within a set of floating point instructions which also include add, substract, multiple, divide, square, square root, normalise, negate and absolute value. The package occupies core areas 5-7, 15, 40-64 and 5463-7543.

Core Storage Required:	5-17, 15, 40-64 and 5463-7543.
Hardware Required:	Input-output device e.g. ASR33 TTY
Source Language:	PAL III
Restriction, Deficiencies, Problems:	Numbers range 10^{-38} to 10^{+38}

DECUS NO. 8-797

LSPCF: Least Squares Polynomial Curve Fitting Program

J. deBoer and Douglas L. Martin
National Research Council of Canada, Ottawa, Canada

The Program uses Bjorck's Modified Gram-Schmidt orthonormalising process. It will least squares fit a power series of up to 17 terms (ranging from power -4 to power 21) to a number of data point pairs exceeding the number of terms in the series but otherwise unrestricted. This is done using a basic 4K-core PDP-8 with no peripherals apart from the ASR33 Teletype but a special

DECUS NO. 8-797 (Continued)

5-word floating point package must be used. The first pass of the data tape produces the power series coefficients. An optional second pass produces the deviations of individual points from the fitted series and the error limits of the coefficients.

Core Storage Required:	0-4377, 4600-5461
Hardware Required:	Input-output device e.g. ASR33 TTY
Other Software Required:	Five Word Flating Point Package (DECUS 8-796)
Source Language:	PAL III
Restriction, Deficiencies, Problems:	Will not accept x=0 ; possible error messages which might be avoided by rescaling data.

DECUS NO. 8-798

OS/8 to RSTS Interface

R. J. Tapp
University of Victoria, Victoria, B.C. Canada

Consists of an OS/8 device handler and a BASIC-PLUS program which make a KL8 serial interface emulate an OS/8 disk when connected to a RSTS terminal port. This allows serial lines from a RSTS system to provide inexpensive supplementary mass storage for satellite OS/8 systems.

Monitor/Operating System:	OS/8 Version 3
Core Storage Required:	1 page (128 words)
Hardware Required:	KL8-J and DL11-C Serial interfaces
Other Software Required:	OS/8, V3
Source Language:	PAL-8

DECUS NO. 8-799

Dose Calculation of Irregular Fields

Pei-nan Tsung, Ph.D.
The Buffalo General Hospital, Buffalo, New York

The dose calculation of irregularly shaped fields for therapy treatment planning using Co-60 and 4MV linac radiation has been accomplished by writing and utilizing a routine digital computer program algorithm.

Monitor/Operating System:	OS/8
Core Storage Required:	12K
Source Language:	FORTRAN II

DECUS NO. 8-800

Heat Loss Calculation

Theodore E. Bridge
54 Williamsburg Drive, Springfield, MA 01108

This program was designed to make a straightforward heat loss calculation very much as you would make one manually. You could make such a manual calculation almost as quickly, but his program will leave a printed record of all parameters used. For checking, a manual calculation must be repeated. The machine calculation can be checked by scanning the output.

Core Storage Required:	4K
Hardware Required:	ASR 33 Console
Source Language:	PAL

DECUS NO. 8-801

MORSE: Morse Code Coder and Decoder

Bruce Filgate
Digital Equipment Corporation, Marlboro, MA

This program was created on a PDP-8, to generate and decode Morse code when executed by the MPS (8008-1). The program can handle code speeds from 7.2 WPM to 80 WPM. Input is via a sense line, output is on a drived line. The Logic Products starter set contains the required CPU configuration. Input decoding is self tracking as to code speed.

Monitor/Operating System:	MPS
Core Storage Required:	1200 decimal location
Hardware Required:	MPS M7341; Terminal, code key
Source Language:	MLA (Module Language Assembler)

DECUS NO. 8-802

SSP: Scientific Subroutine Package

Sandia Labs (IBM) and H. David Todd
Submitted by Robert Hassinger, Liberty Mutual Research Center, Hopkington, MA

The Scientific Subroutine Package (SSP) is a collection of over 250 FORTRAN subroutines divided, for the sake of presentation, into two groups: statistics and mathematics. Also, over 200 subroutines are presented in both single and double precision mode. SSP is a collection of input/output-free computational building blocks that can be combined with a user's input, output or computational routines to meet his needs.

Monitor/Operating System:	OS/8
Core Storage Required:	8K Minimum
Hardware Required:	OS/8 Configuration

DECUS NO. 8-802 (Continued)

Other Software Required:	OS/8 FORTRAN IV
Source Language:	FORTRAN IV

DECUS NO. 8-803

FOLMAT

G. Chase
Portsmouth Abbey School, Portsmouth, Rhode Island

There exists a DEC Program, "FORMAT". It takes a Binary File (.BN) for input and outputs a paper tape which can be loaded and auto-started by the Rim Loader. FOLMAT was created to meet several needs: faster loading; a better binary loader that will reject false codes; the avoidance of high-order bit pick up; a built in readable punch (64-char. set) for the "head"; ability to omit the auto-loader, or to transfer ASCII files.

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	OS/8 configuration
Source Language:	PAL-8

DECUS NO. 8-804

MUSIC: PDP-8 MUSIC PLAYING PROGRAM

Richard Wilson and others
Digital Equipment Corporation, Maynard, MA

MUSIC is a program which will play music in four part harmony on any PDP-8 family core memory computer, except the 8/S or PDP-12. The music to be played is input to the program as a standard OS/8 ASCII file. The music may be picked up by the use of an AM radio, or by a simple interface. The OS/8 distribution media include the source of the player, which can be customized for various configurations, along with approximately 45 minutes of music, such as Joplin, Bach, Beethoven, movie tunes, etc.
The binary paper tape is intended for any 1.5 microsecond PDP-8, and runs in 4K, but will only play short tunes. Several short tunes are available on paper tape.

Core Storage Required:	4K or greater
Hardware Required:	A radio and the device of distribution
Other Software Required:	Binary loader or OS/8
Source Language:	PAL-8

DECUS NO. 8-805

PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and punch

Guy Schayes, University of Louvain, Louvain-la-Neuve, Belgium

DECUS NO. 8-805 (Continued)

This handler is to be used under RTS-8 executive (DEC NO. QF020) and drives the paper tape reader and punch in a manner quite similar to the DEC Terminal Handler task.

Monitor/Operating System:	RTS Executive
Core Storage Required:	2 pages (256 words)
Hardware Required:	PDP-8E with high-speed punch and reader, ASR33
Other Software Required:	RTS-8
Source Language:	PAL-8

DECUS NO. 8-806

SAC8: Simulation of an Analogue Computer

H. - W. Ridder
Radiologiezentrum der Philipps-Universitat, Marburg, Germany

This program computes the solution of maximal 8 simultaneous, first-order, linear, homogenous differential equations with constant coefficients. It simulates an analogue computer with 8 integrators.

Core Storage Required:	4K (8K optional)
Hardware Required:	Teletype or DECwriter LA30
Other Software Required:	Floating Point Package DEC8-5B-S
Source Language:	PAL-D
Restricitions, Deficiencies, Problems:	Program tested on PDP-8S only

DECUS NO. 8-807

UTILITY Routine and Patches for the FORTRAN Compiler

Dr. IR. L. Boullart
Stedelijk Instittuut voor Handel & Secretariaat Gent, Belgium

These patches enable a user with only a low-speed reader/punch to write, compile, load and run FORTRAN-written programs. One of the FORTRAN library programs "UTILITY" has been rewritten to allow use of the low-speed reader/punch at run-time and is included with this offering

Core Storage Required:	8K
Hardware Required:	PDP-8E, 8K, TTY
Other Software Required:	8K FORTRAN Compiler, 8K Sabr Assembler, 8K Linking Loader
Source Language:	PAL-8

DECUS NO. 8-808

Probability Density Functions of Analogue Signals with the LAB-8 System

Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin, Germany

This program will perform the probability density of an analogue x(t).

Hardware Required:	Lab-8 System
Other Software Required:	Floating Point Package, Vers. B (DEC-Ø 8-YQ2B-PB)
Source Language:	PAL-8

DECUS NO. 8-809

FFT or IFFT of an Analogue Signal with the LAB-8 System

Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin, Germany

The FOURIER transform or inverse FOURIER-transform of an analogue signal is calculated.

Core Storage Required:	8K
Hardware Required:	LAB-8 System
Other Software Required:	Floating Point Package, Version B (DEC-Ø8 - YQ2B-PB)
Source Language:	PAL-8

DECUS NO. 8-810

PING: Ping-Pong Game on Display

M. Boniface
Laboratoire de Physique, U.E.R. de Pharmacie, Lille-cedex, France

This program allows the users to play a kind of ping-pong on the display. The rackets (cursors) are set by the levels of analogic channels. The speed of the ball (spot) and its direction vary during the game with the rebound.
Documentation and listing are in French.

Core Storage Required:	4 pages
Hardware Required:	EAE, clock A/D converter, display
Source Language:	PAL III

DECUS NO. 8-811

DYNOD: DYNAMIC OCTAL DEBUGGER

S. M. Morrissey
S.T.C. Capacitor Div., Brixham Road, Paignton, Devon, England

"DYNOD" is a simple ODT, limited to examination and changes to core locations in any field. It was written for an on-line interrupt driven system, for use without stopping the background job. It uses 1 page of core if external I/P and O/P routines are used, approx. 17Ø locns. if self contained.

Core Storage Required:	170 locations
Hardware Required:	PDP-8 ASR33
Source Language:	PAL 8
Restrictions, Deficiencies, Problems	Care must be taken with format of entries.

DECUS NO. 8-812

CASINO: Sykes Cassette Input/Output

M.G. Fishel, R. Vyncke - Author
S. Orloff - submitter
Free University Brussels V.U.B., Brugman University Hospital, Brussels, Belgium

Program CASINO saves core image files of up to 4K on cassettes or reloads saved files from cassette into core, avoiding slow and noisy paper tape handling. Program CASINO resides on one page in core and is fully relocatable. A bootstrap is provided. CASINO was written for a system with the following configuration: PDP8-E, VTØ 5 and SYKES 322Ø.

Core Storage Required:	One page (200 locations), 4K
Hardware Required:	PDP-8E, VTØ 5, Sykes 3000 Series Cassette Unit
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	HIGH SPEED SEARCH OPTION required with cassette unit.

DECUS NO. 8-813

DIGFIL: RECURSIVE DIGITAL FILTER

H. - W. Ridder, K. Meinke

Radiologiezentrum der Philipps-Universitat, 355 Marburg, Germany

This program is written for on or off-line digital filtering. It combines high accuracy by multiple precision computation with convenient decimal input of

DECUS NO. 8-813 (Continued)

filter coefficients. The program may be extended by user written subroutines for data acquistion etc.

Core Storage Required:	4K
Hardware Required:	TTYor DECwriter LA30
Source Language:	PAL-D

DECUS NO. 8-814

PROCES: An Image Processing Program for the PDP-8E

Peter Lemkin and Bruce Shapiro
Image Processing Unit, National Cancer Institute, National Institutes of Health, Bethesda, Maryland

"PROCES" is a stand-alone PDP-8E program running on the Image Processing Unit's (IPU) "Real Time Picture Processor" (RTPP) which is used to process 256x256 raster scan picture files. It can display a 256x256 raster on a Dicomed Display with 64 levels of gray, print subpictures (up to 72x72) on a teletype or lineprinter, output a processed picture into a picture file, average it, take its laplacian or gradient, and perform picture operations (max, min, +, -, *, /) on two gray scale pictures. In addition, PROCES can find a boundary, mask an image with the boundary, generate a gray scale histogram display or printout, and find the maxima/minima of the gray scale histogram. The IPU uses digitized images of microscopic fields acquired via a galvanometer scanner, but any properly formatted Digital array may serve as "pictures."

Monitor/Operating System:	OS/8, V3
Core Storage Required:	32K
Hardware Required:	EAE required. (LPT:, scanner, display if available, but not required
Source Language:	FORTRAN II/SABR

DECUS NO. 8-815

BINPUN: OS/8 Binary Punch from Core Image Files

Torben Poulsen
Technical University of Denmark, Lyngby, Denmark

BINPUN is used to generate a binary paper tape version of a save program (core image file), and thereby achieve a safety backup copy of the saved program. The binary output from BINPUN contains all necessary codes and can be loaded by means of the ABSLDR program. The saved program to be punched needs not be loaded in core prior to punching as BINPUN read the codes directly from the core image file.
If needed BINPUN is able to merge multiple files into a single binary paper tape.

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	EAE, TTY and/or high speed punch
Source Language:	PAL-8

DECUS NO. 8-816

PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter

Shlomo Z. Ron
New York City Health and Hospital Corp.
New York, New York

This is a package of two independent FORTRAN II subroutines; one for plotting on Tektronix 611 storage scope and the other for plotting on an incremental CALCOMP 563 plotter. The calling format for the two subroutines is basically the same. The subroutines provide for pen up and pen down, best approximation to a straight line, coordinate plotting and plotting of x at desired locations.

Monitor/Operating System:	OS/8
Core Storage Required:	One page for scope and two pages for plotter
Hardware Required:	KV8E and storage scope, incremental plotter
Source Language:	SABR

DECUS NO. 8-817

LABCOL I: Laboratory Control and Automation Language

Donald A. Walter and Kathryn B. Willis
West Virginia College of Graduate Studies, Institute, West Girginia

LABCOL I is a user oriented language to be used on PDP/8 series computers for control of laboratory devices or other equipment. It is easily used by those familiar with FORTRAN, BASIC, or other computational languages. Commands are easily substituted or added, and it can be readily adapted to various peripheral device configurations. The language has these features: integer arithmetic; decision and branching; subroutines; variable, numerical, array, and literal arguments; nesting and looping; one and two dimensional arrays; and manipulation of symbol lists.
LABCOL I is particularly suited for conducting human and animal research, where experimental decisions must be made based on responses.

Core Storage Required:	4400_8
Hardware Required:	PDP-8E, ASR33, DK8-EC, VC8E, (DR8-EA*)
Other Software Required:	RIM-BIN
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	*Program has been used with user designed 12-bit relay I/O interface. Adaptable to any 12-bit interface configuration.

June 1976

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BASIC8-30	LIB12 - Mathematical and Graphing Routines
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II. PLOTTING

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BASIC8-85	BASIC FOOTBALL

PDP-8 PROGRAMS WRITTEN IN BASIC

Most BASIC8 programs consist only of a write-up and listing and are offered at no charge for the first copy and $1.00 for each additional copy. Any tapes offered are indicated after the abstract. Associated service charges are also indicated. Programs may be requested on the regular DECUS Order Form.

BASIC programs for computer lines other than the PDP-8 can be found in the appropriate catalogs.

A list of programs written in BASIC for the PDP-8 and submitted to the DECUS Program Library before the institution of a separate BASIC8 library follows. Abstracts may be found in the PDP-8 section of this catalog.

DECUS NO.	TITLE	COMMENT
8-159	CINET-BASIC	An interpretive compiler
8-195	POLY-BASIC	A compiler and operating stand-alone system
8-331	Roulette	Written in CINET-BASIC
8-332	The Civil War Game	Written in CINET-BASIC
8-346	Pollution Game	
8-361	Game of Chance	
8-394	BASIC MOO	
8-401	Dice Game and TIC-TAC-TOE	
8-406	STATPAC Revisions for PDP-8/I and TSS/8	From Dartmouth BASIC Library
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* Per Routine

No.	TITLE	MEDIA/PRICE CODES
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* Per Routine

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Charges for DECUS three-ring binders are:

One inch (1") Black Program Library Catalog Binder - $2.50
Two inch (2") Blue general DECUS binder - $3.50

When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

A complete set of all current BASIC8 write-ups is available for a service charge of $10.00.

BASIC8 PROGRAM ABSTRACTS

BASIC8-1
MATHEMATICS - SET 1
Source: Digital Equipment Corporation
Includes:

BASKT - Demonstrates exponential convergence.

BICYCL - Solves simple time-speed-distance problem.

BOOKS - Demonstrates method of improving upon brute force to solve simultaneous equations.

CONVRG - Converges on e and π by three methods.

DRINKR - Solves simple drinking/blood pressure relationships.

GROUP - Demonstrates brute force vs. substitutional solution of simple equations.

PASCAL - Method of generating Pascal's triangle using random numbers.

PROGRS - Solves a number progression problem.

QUADRT - Solves for the roots of a quadratic equation.

ROOTS - Finds the roots of any function between -20 and 20.

SIMUL - Solves simultaneous equations by brute force.

TICKET - Introduces the concept of logical branching.

CRSCNT - Solves for the area of a crescent (not generalized).

LADDER - Solves the slipping ladder program by Pythagorean Theorem.

CAI-ADD - Demonstrates a Computer Assisted Instruction drill and practice routine.

DISTANCE - Calculates distance between points in three-dimensional space.

BASIC8-2
MATHEMATICS - SET 2
Source: Polytechnic Institute of Brooklyn
Includes:

CRVLEN - Computes the length of any curve (analytically defined).

CVAREA - Computes the area under any curve (analytically defined).

GCD - Finds the greatest common divisor of any set of numbers.

LIMSIN - Evaluates the limit of sin x/x as x approaches zero, in both radian and degree measure.

PI2 - Computes the area of a circle using both inscribed and circumscribed regular polygons.

PRIFA - Finds prime factors.

QUADRT2 - Describes the graph of a second degree equation, $Ax^2+Bxy+Cy^2+Dx+Ey+F=0$.

RATIO - Solves for the unknown in a proportion.

ROOTS2 - Finds the real roots of the quadratic equation $ax^2+bx + c = 0$.

SETS - Finds the union and intersection of any two numerical sets.

SIMEQN - Finds solutions to sets of up to ten simultaneous equations.

SLOPE - Computes the tangent slope for any function.

SQRT - Finds the square root of counting numbers up to five decimal places.

STATAL - Calculates the arithmetic mean (average) of a set of numbers.

SURFAR - Computes the area of any surface of revolution.

VOLSOL - Finds the volume of solids of revolution.

ARITH - Multiplication involving one and two digit multipliers.

BASIC8-3
MATHEMATICS - SET 3
Source: Varied
Includes:

ROUNDOFF - F. McPhetres
Rounds off numbers to any number of places.

SETS-1 - CAMP, First Course
Determines the intersection of two sets of numbers.

TUTOR-1 - Walter Koetke
Drill and practice with time-speed-distance.

AREA-1 - Computer Methods in Mathematics
Solves for the area under a curve by equation.

BASIC8-3 (Continued)

FLIP-1 - Basic BASIC
Uses random number generator in BASIC to flip a coin.

EXPON - NREL/SDC
Solves for the exponent in general exponential equations.

CERES1 - DYMAX
Computes and prints the sum of the first n terms of the following series:

$$1-1/2+1/2-1/4+\frac{1}{5}-\frac{1}{6}\sim+(-1)^{k-1}(1/K)+\sim$$

GCD - Adapted from the FOCAL program written by Roger B. Kerchner, Carleton College
Applies the Euclidean algorithm to the problem of finding the greatest common divisor for M and N.

WALK1 - Bill Walker
A generalized plotting routine which prints a graph of an expression given in terms of x.

GAUSS - Philip Sorgen
Uses the Gauss-Jordan Elimination Method to solve N linear equations in N unknowns simultaneously.

ABSVAL - DYMAX
A series of seven programs which compute and print the absolute value of X.

ME EPSILON YOU DELTA - Roger Kerchner
A game designed to help in understanding the limit concept.

SINPLOT - Dennis Lunder
Plots and prints a graph of the sine for function from 0-360 degrees

GOLDBACH - CAMP, First Course
Provides new ways to approach theorem proving using Goldbach's Conjecture.

LINEAR - Frederick Brink
Finds the point where linear systems in 2 or 3 variables intersect.

BASIC8-4
PLOTTING - SET 1
Source: Digital Equipment Corporation
Includes:

DIAMON - Plots on N by N diamond matrix.

PLOTFN - Plots any function.

SINEX - Plots a sine wave.

3DPLOT - Plots any three dimension functions.

NOTE: The following routines are for teletype compatible plotters.

TPLOTU - Utility support routine for TSP-212 plotter.

FPLOTU - Utility support routine for TSP-212 plotter

TPLOT1 - Plots a family of 10 sine curves.

TPLOT2 - Plots random horizontal and vertical lines.

TPLOT3 - Plots connected horizontal and vertical lines similar to Etch-A-Sketch.

TPLOT4 - Plots random length, random direction lines. Looks like electron traces.

TPLOT5 - Polygon designer. Plots any polygon given the external angle and number of sides.

TPLOT6 - Spiral designer. Plots a spiral of any shape given the external angle.

TPLOT7 - Bar chart and point to point graph.

TPLOT8 - Plots characters 1 to 8 at random locations with size proportionate to their value.

TPLOT9 - Plots "3-dimensional" exponential functions.

FPLT10 - Plots any function.

BASIC8-5
PLOTTING - SET 2
Source: Varied
Includes:

PLOTTR - Plots the graph of any function.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-6
PHYSICS - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

BFIELD - A plot routine illustrating the B field about one and two wire currents. (Electricity and Magnetism)

BOHR - Hydrogen line spectrum and energy level diagrams are displayed. (Atomic and Nuclear)

CALOR1 - Calorimetry experiment to determine the heat energy to be supplied (or removed) from each mass to obtain the equilibrium temperature. (Mechanical)

DECAY1 - Radioactive decay is treated qualitatively in a game-type situation.

BASIC8-6 (Continued)

DECAY2 - Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EFIELD - An extension of Coulomb's law. Finds the relative field strength at a distance from a line and plane of charge. (Electricity and Magnetism)

KINERV - Review of kinematics; presents questions concerning the movement of a ball in flight. (Mechanical)

LENSES - Solves lens problems. (Light and Waves)

MASSD - Calculates mass defect.

NEWTN2 - A problematic situation requiring repeated application of Newton's second law. (Mechanics)

PHOTEL - Critical wavelength for photoelectric emission is to be determined in a simulated experiment. (Atomic and Nuclear)

PHOTON - How energy levels are determined from the emission of excited atoms. (Atomic and Nuclear)

PLANK - A photoelectric simulation. Students adjust the retarding potential to determine the wavelength of randomly selected electron emitting X-rays. (Atomic and Nuclear)

PRJTL - Coordinates and speeds are printed for a projectile fired at selected speeds and angles (frictionless). (Mechanical)

REFLCT - Least time principle of light is presented as a challenge involving a game analogy. (Light and Waves)

SLITS - A plot routine permitting further exploration of Young's Double Slit experiment. (Light and Waves)

SNELL - A plot routine to aid in visualizing Snell's law. (Light and Waves)

SPACE - Demonstrates the effects of changing velocity on orbital motion. (Mechanics)

VFIELD - Plots a picture of the relative potential strength in the region surrounding two charges. (Electricity and Magnetism)

VLOCTY - Demonstrates that average velocity (D/T) approaches a limiting value as T O. A graph of D vs. T is plotted for an acceleration of 1 meter/ sec^2. (Mechanics)

WAVES - Plots a graph of a fixed and a variable wave, and the superposition of the waves. (Light and Waves)

BASIC8-7
PHYSICS - SET 2
Source: Varied
Includes:

KINEMA - Digital Equipment Corporation
Tests knowledge of kinematics

PHOTOE - Huntington Computer Project
Demonstrates photo electric effect.

UELEC - J. Martin
Produces tables of electric potential.

NEWTON - Project SOLO
Problems using Newton's second law.

ACCELER - Calculates the time in seconds it takes a vehicle to accelerate from zero to sixty miles per hour given curb weight, brake horsepower at maximum torque, and rear axle ratio.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-8
CHEMISTRY - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

ATWT - Calculates atomic weight from percent abundance of isotopes.

AVOGA - Calculates Avogadro's number.

DECAY1 - Radioactive decay is treated qualitatively in game-type situation.

DECAY2 - Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EMPIR - Calculates empirical formulas.

EQUIL1 and EQUIL2 - Calculates the effects of concentration changes in the equilibrium systems: $2HI \; H_2 + I_2$ and $PCl_5 PCl_3 + Cl_2$.

KINET - Tabulates and graphs equilibrium concentration data.

MASSD - Calculates mass defect.

MOLAR - Calculates molarity from titration data.

PHPOH - Calculates pH, poH and percent dissociation.

PRCNT - Calculates percent composition.

STOICH - Solves mass/mass, mass/volume, and volume/volume problems.

BASIC8-9
CHEMISTRY - SET 2
Source: Varied
Includes:

GASVOL - NREL/SDC/DEC
Calculates and plots gas volumes at various pressures.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-10
BIOLOGY - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

EVOLU/SIMPLIFIED VERSION - Demonstrates evolutionary mutations of pepper moths.

EVOLU - Simulated experiment - The relationship between evolution and natural selection is accomplished by studying a population of mutant moths.

DROS - Game approach to determination of the genetic characteristics of Drosophila.

GAMGN - Review of gametogenesis using diagrams and questions.

MEMBR - Experiment simulation showing the active and passive transport of materials across a membrane.

NZYMC - Simulated experiment - Degree of enzyme reactivity varies as environmental conditions are changed.

NZYM2 - Simulated experiment - Maximum enzyme reactivity is shown as being dependent upon an interaction of environmental conditions.

PHOSYN - Simulated experiment - Photosynthetic production of sugar varies as student varies light intensity or carbon dioxide concentration.

BASIC8-11
EARTH SCIENCE - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

CLIMAT - Practice in identifying climates and climatic patterns.

CLOUDS - Explores problems related to the formation of cumuliform clouds.

WATER1 - A tutorial program which goes through the calculations of a water budget.

WATER2 - Prints a complete water budget.

BASIC8-12
BUSINESS AND SOCIAL STUDIES - SET 1
Source: Varied
Includes:

POPULATION - Gruenberger and Jaffray
Examins population growth of the U. S. and Mexico

BALANC - Polytechnic Institute of Brooklyn
Simulates the effects of the relationship between costs of production and revenues.

BANK - Polytechnic Institute of Brooklyn
Solves financial problems concerning installment buying, long term loans and savings accounts.

CIRFLW - Polytechnic Institute of Brooklyn
Simulates the effect of a change in consumption of the "Circular flow model of goods, services and money."

CONSMP - Polytechnic Institute of Brooklyn
A simulation of economic depression and equilibrium as effects of consumption.

STOCK - Polytechnic Institute of Brooklyn
Simulates the stock market.

PURCHS - Dennis Lunder
Projects the purchasing power of the American dollar from 1970 to 1980 based on a base figure of $1.00 value for the year 1959 and values from 1960 to 1969.

BASIC8-13
ADMINISTRATIVE - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

AVERG1 - Averages grades, lists value of curve, and adjusts grades.

AVERG2 - Sorts and averages grades.

FREQ - Prints a frequency distribution (bar graph) of grades.

GRADE - Prints a table of grades (in percentages), number of questions missed, and number of questions answered correctly.

ITEM1 - Counts and prints number of times questions are missed.

ITEM2 - Sums item analysis.

STAT - A statistical analysis of laboratory data. (For teachers' use)

STATAL - Calculates the arithmetic mean (average) of a set of numbers.

BASIC8-14
COMPUTER WORKSHOP
Source: Alvin Beal

This workshop is intended to provide the teacher or administrator with a knowledge of creating a list of instructions (a program) for a computer to perform. It is a clear, concise, step-by-step set of instructions which introduce the user to the computer and its functions.

BASIC8-15
BUSINESS AND SOCIAL STUDIES - SET 2
Source: Varied
Includes:

DEPRECIATE - Digital Equipment Corporation
Demonstrates 3 methods of depreciation.

SORT-1 - Digital Equipment Corporation
Sorts a list of numbers.

FIFO - Gregg Accounting, Advanced Course
Demonstrates FIFO inventory.

INDIAN - NREL/SDC
Manhattan Island interest problem.

INT-1 - CAMP, Algebra
Interest compounding given one principal amount.

INT-2 - Huntington Computer Project
Interest compounding with regular deposits.

SORT-2 - Computer Methods in Mathematics
Sorts a list of numbers (2nd method).

TRUINT - David Ahl
Calculates the true annual interest rate charged on an installment load.

COMINT - Steve Kramer
Calculates compound interest on a bank deposit.

BASIC8-16
GAMES - SET 1
Source: Varied
Includes:

GUESS - Walter Koetke
Binary search guessing game vs. the computer.

LUNAR2 - Digital Equipment Corporation
Simulates the landing of a lunar module on the moon.

SLOTS - Anonymous
Simulates a one-armed bandit.

EDBARD - Digital Equipment Corporation
Random poetry writing program.

GAME OF LIFE - A. Christopher Hall; A. E. Sapega
A sort of solitaire game, played on a large grid.

MTCHS
This program simulates the game of 23 matches.

GOMOKU
Simulates the traditional game of the Orient, GOMOKU, on a 7 X 7 board.

AMAZIN - Jack Hauber
This program prints out a different maze every time it is run. User specifies length and width. There is only one path through the maze.

GOLF - Howard Kargman
Simulates a game of golf for 1 to 4 players.

TIC-TAC-TOE - Joseph Salamon
Allows user to play TIC-TAC-TOE with the computer. User should always lose or come to a draw.

SIMULATION BASEBALL - Jeff Moskow; Brad Golden
Allows the user to play a nine inning game of baseball against the computer.

DISTANCE GAME - Tom Adametz
Figures out distance implied by 2 random numbers labeled TIME and SPEED.

NUMBER GAME - Tom Adametz
Computer compares a number from 1-5 with a set of random variables. Winning depends on whether or not chosen number compares with variable.

COINS
Simulates coin tossing game.

RUSSIAN ROULETTE
Simulates the game of Russian Roulette.

BASIC8-17
KRIEGSPIEL
Source: A. Christopher Hall; A. E. Sapega

KRIEGSPIEL is a variation of chess, and is played by the same rules, except that neither opponent can see the other's position. They play on separate boards and there is a judge who tells them if their moves are legal and gives other information regarding the game.
Paper Tapes: $2.00

BASIC8-18
POKER
Source: A. Christopher Hall; A. E. Sapega

In this game the user plays draw poker against the computer.
Paper Tape: $2.00

BASIC8-19
MISCELLANEOUS - SET 1
Source: Varied
Includes:

INDUC - Digital Equipment Corporation
Determines value of an unknown inductor

RESIST - Computer Methods in Mathematics
Computes equivalent resistance for resistor networks.

A SIMPLE APPROACH TO CYBERNETICS - Roy Atherton
A simple classroom approach to cybernetics based on a version of the ancient game "Two Finger Morra."

CHANGE - Dennis Lunder
Simulates an automatic cash register.

SCIENCE FICTION PLOTS - Reha Gur
Develops random plots to science fiction stories.
Configuration: 8K

BASIC8-20
GAMES - SET 2
Source: Varied
Includes:

BASEBALL GAME SIMULATION - Dave Davidson and Bill Weaver
Simulates a baseball game, keeping track of runners, innings, scores, etc.

HORSE RACE GAME - Tom Adametz
Simulates a race between 5 horses. Initial stake is $500.

PDP-8 500 AUTO RACE GAME - Tom Adametz
Simulates an auto race.

KENO - V. Fazio
Plays the game of KENO on the computer.

YATZEE - Bruce Baker III
Simulates the dice game YATZEE on the computer.

SIMULATION BASEBALL - Jeff Moscow; Revision by Bob Tedford
Simulates a baseball game. Uses OS/8 BASIC

FOOTBALL - Ed Vogel
Plays football with the computer. Allows for both offense and defense.

HORSE RACING - Richard Balekdjian
Race between 7 horses; initial stake $750.

BASIC8-21
THE MONOPOLY GAME
Source: Edward M. Meyer

Plays the Monopoly Game on a TSS/8. Up to 6 players.
Paper Tapes: $8.00

BASIC8-22
BASEBALL
Source: Richard Balekdjian

Plays number of innings specified by user. Offers a variety of strategies.
Paper Tape: $2.00

BASIC8-23
SIMCOM
Source: Dan Gutierrez

A simulated compiler, designed to give the beginning programmer a taste of internal computer applications.
Configuration: 8K PDP-8/E, ASR33
Language: Edusystem-30 BASIC

BASIC8-24
TRAN
Source: Michael A. Radtke

Translates a .BAS file to a .DAT file.. Recognizes integers, real numbers, scientific notation and strings.
Configuration: TSS/8

BASIC8-25
LABEL
Source: Russell Lyons

Punches readable characters on paper tape, using low punch. Can punch all characters from 240 to 336 (ASCII)
Configuration: TSS/8
Language: TSS/8 Extended BASIC
Paper Tape: $2.00

BASIC8-26
LIB17 - Package of Mathematical Routines
Source: Geoffrey Chase

These programs were developed in the process of revising, occasionally correcting and recoding certain Hewlett-Packard programs for use with Edu-20 BASIC. Other programs were added as need arose. Programs include routines for Complex Numbers, Matrices and Determinents, Extended Precision Routines and Utility Routines.
Language: BASIC
Paper Tapes: $8.00

BASIC8-27
Multiple Choice Quiz
Source: Kenneth Lubar

A program for computer assisted instruction applicable to many subjects. It is designed for multiple choice testing. Answer feed-back is included and testing statistics are available to the instructor only.
Configuration: 4K TSS-8
Language: BASIC
Paper Tapes: $2.00

BASIC8-28
Mathematics - Set 4
Source: Varied
Includes:

WKSHT1 - Generates factoring trinomials or mult. of binomial worksheets.

WKSHT2 - Generates worksheets for solving equations of the form AX+B=CX+D, where X is an integer.

LISSAJOUS FIGURES - Plots the graph of two time-dependent sinusoidal functions, one in X and one in Y, on a single Cartesian coordinate system.

TRIAD - Will determine the numerical values for the corresponding parts of triangle ABC.

POLFAC (Polynomial Factoring) - Will find the integral and/or rational zeroes of any sixth degree polynomial or less where the first and last terms' coefficients are integers.

BASIC8-29
Games - Set 3
Source: Varied
Includes:

LEM - Simulates a landing on the moon.

LETTER - Prints words on a local (slow-speed) paper tape punch.

OVERKILL - Overelimination of population by input of correct data.

BINGO - Generates up to 300 BINGO cards

TIME - Serves as a sidereal clock for the year 1973.

BASIC8-30
LIB12 - Mathematical and Graphing Routines
Source: Geoffrey Chase

A series of twelve programs written on 8K - 2 user Edu-20. Routines include:

UNFLOT - The user inputs, in octal form, three 12-bit (4-digit) numbers representing the high, middle and low words of the floating AC; the program returns with the equivalent decimal value.

PERFCT - A fast program for finding perfect numbers up to 12 digits of precision.

SORTS - Actually 3 programs: (1) TREES - a binary tree (heap) sort; (2) TOP1 - a fast version of the "top" sort; (3) TOP2 - slower, but it remembers the input order.

CALEND - Prints a calendar for the current year. User inputs year (1969 or later).

POLY - Brute force polynomial search and reduction; user information and control are maximized. If and when quadratic level is reached, both roots (real or imaginary or complex) are calculated and printed.

CUBIC - G. Ruth's general solution of the quartic is in DECUS NO. FOCAL8-263. This program handles only cubics and quadratics, but allows for possible upward expansion by the user.

FRCADD - Adds fractions as fractions, finding L.C.D. and reducing answers to lowest terms. Written primarily for Edu-20/25, since these allow direct fractional input.

REPTER - A string of up to 6 digits, specified as repeating (9.0 repeating means 9.0909090....) or terminating (9.0 terminating is just 9) is converted to a proper or improper fraction reduced to lowest terms.

SINCOS - Graphs sine & cosine curves, with some attention to speed in execution.

ELLHYP - Tangent ellipse/hyperbola, with asymptotes of the latter.

POINTS - A series of graphs, on increasingly larger scales, of the hyperbolic curves of addition and cancellation of radiation from 2 point sources.

HARMON - A series of curves successively approximating a sawtooth or a square wave (user choice).

Language: BASIC
Paper Tapes: $8.00

BASIC8-31
Mathematics - Set 5
Source: Walter Koetke
Includes:

STNDEV - Calculates the mean, biased and unbiased variance, biased and unbiased standard deviation and standard error for one set of numbers.

PRIME - Determines if number N is a prime number.

TABLE - Table of values of sine and cosine function from 0 to 90.

PERMS - Prints all permutations of N letters.

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BASIC8-31 (Continued)

DIVIDE - A simple exercise in division.

DERIV - Figures an approximation to the derivative.

CONTOURS - Demonstrates the level curves (contours) of a function of two variables.

MAX - Finds the maximum value of a function of an interval.

CHINES - Solves N simultaneous congruences of the form: A*X congruent to B (MOD M).

EUCLID - Finds the greatest common divisor of two integers, together with the weighting factors by which the GCD is expressionable as a linear combination.

SIEVE - Demonstrates the sieve method of finding primes.

FRSQRS - Writes positive integers as the sum of 4 squares.

INSCRB - Prints first ten Pythagorian triangles and the radius of the inscribed circle of each.

FACTAP - Computes factorials by Stirling's formula.

EASYØ2 - Lists factors for given number N.

FACTRL - Computes the sum of the first N factorials.

SPHERE - Relationship of surface area, radius and volume of spheres.

BASIC8-32
Mathematics - Set 6
Source: Varied
Includes:

QTABLE - Produces a table of values for all algebraic and many rational functions.

CORREL - Calculates coefficient of linear correlation based on pairs of data supplied by the user.

INTEGR - Approximates a definite integral by using a Riemann sum for a user supplied function.

QUADEQ - Will solve any quadratic equations in the form: $ax^2 + bx + C = 0$.

SIGDIG - Raises any integer to any other integer and prints all significant digits.

EQUA - Shows the step-by-step solution to an equation of the form AX+B=CX+D.

SIMEQ2 - Solves any system of two linear equations in two unknowns.

SIMEQ3 - Solves any system of three linear equations in three unknows.

BASIC8-33
SEQ; SAME; STAT1
Source: Varied
Includes:

SEQ - Gives alphabetic sequence and asks for next letter.

SAME - Exercise in which student finds synonym for given word.

STAT1 - Accepts a minimum of 100 data values and will calculate minimum and maximum values, range, arithmetic mean, median, sample and population standard deviations.

BASIC8-34
Football Scouting Report Systems
Source: Harold L. Singer

Two systems for analyzing football scouting information are described. Results of each play are coded on special mark sense cards and the game is exhaustively analyzed by a series of chained EDU-30 BASIC language programs. Actual use by our coaching staff has produced a time savings of from 18 to 30 coaching man hours per week.

Those not having a CM-8E mark sense card reader but equipment capable of running EDU-30 BASIC or OMSI-BASIC can easily code the play information on paper tape using the TTY.

Either of the two described systems can be used unchanged if your coaches can adapt to the notation system used. If they cannot, these systems should prove excellent guides for producing a tailor made system to your coach's specifications.

Configuration: EDU-30 or OS-8 with OMSI-BASIC preferably with CM-8E mark sense card reader
Language: EDU-30 BASIC
Paper Tapes: $8.00

BASIC8-35
XYPLOT; 3DGRAPH; PLOT-1
Source: Varied
Includes:

XYPLOT - Will plot single-valued functions of X, with X on the vertical axis.

3DGRAPH - Graphs functions of 2 variables. Each graph will be plotted 3 times.
Tape available for $2.00. Order BASIC8-35-2

PLOT-1 - Plots integral values on a teletype terminal. No listing.
Tape available for $2.00 Order BASIC8-35-3

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BASIC8-36
LODICE
Source: David Martin

Simulates rolls of one fair die and one loaded die. Students are to determine, by chi-square analysis, which is which

BASIC8-37
Business and Social Studies - Set 3
Source: Varied
Includes:

AMOR - Computes monthly interest on a loan, given term and interest rates.

PAYRL - Computes and prints the payroll for a small company.

CPI - An economics project to calculate the CPI of a given year.

SALES - Computes and prints the weekly sales for each salesman.

BANKER - Tests student's understanding of different methods of compounding interest.

BASIC8-38
USAGE
Source: Dave Liebschen

Tabulates usage of the computer system. Uses Edusystem 25 BASIC.

BASIC8-39
LILAC: Laband's Ingeneous Little Automatic Computer
Source: Keith Laband

LILAC is a hypothetical machine language written in Edusystem-30 BASIC for a P DP-8 series computer. The program itself is supposed to simulate a real computer's machine language. It contains quite a few instructions that can be found in real assembly languages, but modified in form to fit the needs of this simulator. It also has a few other instructions not found in assembly languages.

Due to the size of the actual program, (on a 4K PDP-8) you are limited to only 175 lines of machine language programming. If you are using a larger BASIC, you can easily modify the program for more programming text.

Since this program simulates many of the steps in learning a real computer's machine language (i.e. the loading and operation of programs) it should be extremely useful to a beginner in machine language programming.
Paper Tape: $2.00

BASIC8-40
Tutorial Exercises in Chemistry
Source: Paul Couchon

Teacher's Guide and Student Workbook are available from DEC's Software Distribution Center for $2.75 and $1.00 respectively. Paper tape for each routine is available from DECUS as indicated below. Please order tapes by Roman numeral (i.e. BASIC8-40, tape I, V, VII, etc.).

I. METEST - Practice in the metric system units for measuring length, mass and volume. Consists of a sequence of multiple choice conversion problems that utilize the units most frequently encountered in science courses
Paper Tape: $2.00

II. DENSITY - This exercise deals with the concept of density. Five different problems are presented, involving the relationships between the fundamental physical qualities of mass, volume and density. Each problem requires some application of the formula:

$$\text{DENSITY} = \frac{\text{MASS}}{\text{VOLUME}}$$

Paper Tape: $2.00

III. ELECTRONS - Drill in identifying the number of electrons having principal quantum numbers 1, 2, 3, or 4 in elements with atomic numbers from 1 - 22.
Paper Tape: $2.00

IV. ATOM - Problem giving the atomic number of an element which lies between LITHIUM and TITANIUM on the periodic table. Student required to describe structure of this atom regarding the number protons, neutrons and electrons in various s and p orbitals.
Paper Tape: $2.00

V. PERIOD - Exercise giving the student practice in using the periodic table and applying the Periodic Law. Questions require an understanding of the relationships which exist between elements and their position in the periodic table.
Paper Tape: $2.00

VI. COMPOS - Quantitative relationships between the elements that compose simple binary compounds. Compound selected at random from 42 possible combinations of six anions and seven cations. Questions asked concerning percent composition and relative number of grams and moles.
Paper Tape: $2.00

VII. EQUATI - Quantitative relationships in chemical reactions, stoichiometry. Students are provided with six balanced equations and must answer a sequence of questions concerning quantitative relationships between substances in three of the reactions.
Paper Tape: $2.00

BASIC8-40 (Continued)

VIII. RAOULT - Practice in solving problems which deal with the concentration of a solution and its freezing point, and the determination of molecular weight.
Paper Tape: $2.00

IX MOLAR - Relationship between the moles and grams of a solute and the volume and molarity of the solution.
Paper Tape: $2.00

X. GASLAW - Relationships between temperature, pressure and volume of ideal gases. Practice in applying Boyle's Law, Charlie's Law and the Combined Gas Law.
Paper Tape: $2.00

BASIC8-41
OMSI30 BASIC
Source: Barry Smith

A version of DEC's EDUsystem-30 BASIC (including all features) operating under the PS-8 and OS-8 systems. The system uses 8K, instead of 4K - offering significantly larger programs and more variables. Compilation speed is also greatly increased.
Paper Tape: Binary $2.00, ASCII $8.00; Listing: $10.00; DECtape: User Supplied $8.00, DECUS Supplied $20.00

BASIC8-42
RECOVE - BASIC RECOVERY FROM CRASH
Source: James Puccio

This program will allow the TSS/8 BASIC programmer to recover from system crashes and user-induced halts of BASIC. If the user is on a system that has two versions of BASIC, one simple BASIC and one extended BASIC, the program also allows selection of which processor to link to.
Paper Tape: $2.00

BASIC8-43a
NEOPLA, PAL-D SIMULATOR
Source: Christopher A. Kryzan

NEOPAL was designed to provide students with a means of working in assembly language while still in BASIC. This also facilitates BATCH running of programs in assembly language assigned by the teacher. Output is in three passes: the first being a listing of the program as read in (in the form of data); the second being the actual execution of the program; and the third being a listing of the program after execution, (or core dump, if you will) as well as the status of the link and accumulator. Numbers are in base ten form, with 2048 equal to -2048, and 4095 equal to -1, etc.
Paper Tape: $8.00

BASIC8-44
MATHEMATICS, SET 7
Source: Varied
Includes:

TUTOR - A drill and practice program designed to develop a student's skills in mathematical processes. Allows a specific area to be chosen, gives number of correct answers and percentage score. Runs under TSS/8 BASIC.

SIMEQ3 - Solves N simultaneous equations using the addition method.

PYTH - Generates sets of whole Pythagorean triples. It neither repeats nor prints multiples.

Paper Tapes: TUTOR $2.00; SIMEQ3 $2.00

BASIC8-45
LIB9: Extended Precision Routines for BASIC
Source: G. Chase

TAPE "A"

1. "LARG2", add or multiply 2 extended-precision integers. A subset of H.-P.'s "L(A)RGNUM" program.

2. "COLUMN," adds an arbitrary number (up to about 999) of extended-precision integers all at once, in a column, so to speak.

3. "EXSUB," subtracts one extended-precision integer from another. Handles negative answers correctly.

4. "EXDIV," swipes an algorithm from Knuth (V. 2) to allow division of an extended-precision dividend by an extended-precision divisor. Both quotient and remainder are printed in full precision (all digits).

TAPE "B"

5. "FACFAC," from Knuth (V. 1) is a remarkably simple program which lists the prime factors and their multiplicity (power) for the factorial of any single-precision integer typed by the user. In addition, a modified Stirling approximation is given of NAT. LOG (N!), COMMON LOG (N!), and of N! . Values of N! over 10 ↑ 38 cause no overflow.

6. "DEC10," extended-precision decimal integer converted to its extended precision octal equivalent.

7. "DECFO," single precision A/B fraction *OR* extended-precision Ø.12345... String converted into extended-precision octal string.

8 "OCIDEC," the inverse of #6: octal integer to decimal. Extended precision, input and output.

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BASIC8-45 (Continued)

9. "OCFDEC," the inverse of #7: octal fraction or octal string (Ø.12345...) converted to decimal string. Extended precision.

WARNING: #7 - especially - and #9 in A/B input mode are quite capable of generating infinite answers.

Paper Tapes: "A" $2.00; "B" $2.00

BASIC8-46
HORSE - TSS/8 HORSERACING PROGRAM
Source: Ed Vogel

This horse race program includes betting, odds, and names for the horses. Its format is different than most other horse racing programs. Written in EDU-system 5Ø BASIC, can be translated to other BASICS. Size is 5 TSS-8 disk segments.
Paper Tape: $2.00

BASIC8-47
FILE: Text Data File Program for TSS/8 BASIC-4
Source: David Dodell

This program creates a BASIC data file and allows the changing, inserting, and addition of numeric and alpha strings of data. A printout can be made in the beginning or end of the program. Deletion of data file available.

Limitations: Will work only with TSS/8 BASIC with data file capability. If disk is full program will not run because data files cannot be created.

Size: 4 TSS/8 Disk Segments
Paper Tape: $2.00

BASIC8-48
STF and STM, Stellar Formation and Stellar Model
Source: Robert Schaffer

Two BASIC programs are provided which can be applied to studies of stellar evolution and nuclear physics. STF is used to simulate the birth of any star, given certain parameters. At the same time, it tests the possibility of stellar contraction and the start of fusion. If fusion becomes possible, STF considers the condensation a star, and it halts. If condensation proves impossible, then no simulation of birth is given - STF halts. The second program, STM, is composed of several sub-programs which represent data concerning a given star. These sub-programs make it possible to compute a sun-relative model for any star, plot an H-R Diagram, plot the Mass to Luminosity ratio, or estimate the radius of a star.

These programs are more applicable to CAI than actual scientific studies, due to a simplified view of the processes involved.

Write-up contains listings. No tapes.

BASIC8-49
GASSER
Source: Kent Springer

This program solves problems involving the Ideal Gas Law equation for any of the four variables in the equation. It will accept temperature in degrees Farenheit, Centigrade, or Kelvin, pressure in P. S. I., atmospheres, or mm of mercury, and volume in liters or milliliters.
Language: EDU20/25 BASIC
Paper Tape: $2.00

BASIC8-50
CSHHS BASIC-73
Source: "PK" Kretzman, George Roukis

CSHHS BASIC-73 is a language patterned after, and in fact, consisting of numerous modifications to DECUS No. 8-195, POLY BASIC. Extensive rebuilding of both the compiler and editing sections have given the language enormous scope and increased power. Nevertheless, almost complete upward compatability has been maintained between POLY BASIC and CSHHS BASIC-73. Features include:

1) Computed GO TO, 2) Extended function definitions, 3) Data repointer, 4) Line search feature, 5) 'Tab' function, 6) Improved text handling, 7) Correction of all known POLY BASIC bugs, and many others.
Paper Tapes: Loader for CSHHS BASIC-73 - Binary $2.00; CSHHS BASIC-73 Object (Special format) $8.00

BASIC8-51
DISEDU - Loading EDUsystem-2Ø on the 4K Disk Monitor System
Source: Jeff Nisler

This program enables the user to load and save EDUsystem 2Ø on the 4K disk/DECtape monitor system.
Source Language: PAL III
Paper Tapes: Binary $2.00; ASCII $2.00

BASIC8-52
APPLE, POSTER, SIGNS
Source: Christopher A. Kryzan, Malcolm Slaney

1. APPLE enables the user to create poster-sized messages by simply typing in the message he wishes to have printed. The program uses a basic 5 by 7 matrix for character formation, with the smallest enlargement ratio, 1, producing a character about 1 1/2" square. The message can be enlarged anywhere from 1 to 9 times, with the maximum enlargement ratio producing a letter height about 7 1/2" to 8" high. The message can be printed out using a single character, or with the characters being used corresponding to the enlarged character being printed.

BASIC8-52 (Continued)

2. POSTER enables the user to produce posters with enlarged characters or figures inputted by the user. POSTER is actually a modified version of Christopher Kryzan's APPLE and is alike APPLY in every way, except that the user is able to design his own characters. This allows for more versatility in character production than APPLE. Messages up to 50 characters may be used (more on larger systems).

3. SIGNS prints signs on a standard 72 space wide teletype. It will print signs anywhere from ten characters to 72 characters wide. It will also start the sign where desired or will automatically self-center according to input. Another major feature is that you can specify whether it is to print black letters on a plain background or a white character on a black background.

Paper Tapes: $2.00 per routine

BASIC8-53
ACEDUC, TICTACTOE, CHECK6C, ONEARM
Source: Edward J. Quigley

1. ACEDUC2, written in, and run under, a three-user configuration Edusystem-20, allows up to six people to play the game of Aceyducey at the same time, with the computer keeping track of each player's money, wins, losses, etc. The computer will also tell the player the odds he faces before he places his wagers.

This program also offers a good example of print-out control.

2. TICTACTOE plays against a human opponent. The program is intentionally beatable. Playing a program that cannot be beaten is very boring. It is not easy to beat the machine, but it can be beaten.

This game runs on a PDP-8/L running a standard Edusystem-20, with a three-user configuration.

3. CHECK6C plays a fair game of checkers against a human opponent. The program will play at the level of a very good amateur. It is usually beaten by a quality opponent, but fares very well against novices and other programs. Full directions are included in the write-up.

CHECK6C runs on an 8K PDP-8/L running Edusystem-20 with a three-user configuration.

4. ONEARM, written in Edusystem-20 BASIC, simulates playing a slot machine. The program allows variable payoff odds, six different fruits (double payoff if you get three boysenberries), and allows the player to carry his winnings or loses from one game to the next, should he care to. The bank breaks at 1000 dollars, and the player is broken at 1000 dollars lost.

The program will run on an 8K PDP-8/L with a three-user configuration.

Source Language: Edusystem-20 BASIC
Paper Tapes: $2.00 per routine

BASIC8-54
NLYSIS, POSTER2, CLNDR5, PIDART
Source: Edward J. Quigley

1. NLYSIS is a program that 'analyzes' handwriting. The signature is put on any data input form (card/paper tape) and the program then goes to work on it.

NLYSIS HAS NO BASIS IN ACTUAL HANDWRITING ANALYSIS.

The program is a good example of how the computer's reputation as a "superbrain" can be used to fool the uninitiated.

2. POSTER2 prints out messages in large block letters, 5 lines by 5 spaces, in several rows, each row printed across the page, rather than down the length of the page.

3. CLNDR5 will print out, in 2 columns down the page, a calender for any given year from 1800 to 2300 A.D.

CLNDR5, with no changes, will run on an 8K Edusystem-20 with three users. When abbreviated (through the use of three-letter commands) the program will run on a four user system.

4. PIDART utilizes the random number generator to approximate pi.

These programs will run on a PDP-8/L with 8K and Edusystem-20 BASIC.

Paper Tapes: $2.00 per routine

BASIC8-55
101 OS/8 BASIC COMPUTER GAMES
Source: Various - Original compilation by David Ahl. Revised for OS/8 by Kay Fisher, Digital Equipment Corporation, Maynard, Massachusetts

The original 101 Games, compiled by David Ahl for RSTS-11 BASIC-PLUS, have been revised to run under OS/8 BASIC.

A list of all games offered is included with the write-up. (Numbers can be found in write-up.)

Paper Tapes: $2.00 per routine
2 OS/8 DECtapes: $16.00 User Supplied, $40.00 DECUS Supplied
Listing: $25.00

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BASIC8-56
Laboratory and Display Instructions for OS/8 BASIC
Source: Ronald Jones, Ph.D.

This program is a set of user-defined functions for OS/8 BASIC. It is combined with the LAB/8E functions (DEC-8E-ALOSA-A-LA) to build the file BASIC.UF; a run-time overlay for OS/8 BASIC. These functions control DEC analog and Digital input and output devices and the VC8E display-control. They permit real-time data sampling, with background display, and control of both the X and Y coordinates for CRT plotting.

Language: PAL-8
Object, source, documentation and listing files on one DECtape: $8.00 User Supplied, $20.00 DECUS Supplied.
Hard copy listing: $10.00

BASIC8-57
NEEDIT, Symbolic Editor Program for NEOPAL
Source: Christopher Kryzan

NEEDIT was designed to provide an on-line editing feature for NEOPAL. Through the use of this program, one can construct a program in NEOPAL assembly language and correct errors in programming and in typing which may be encountered. When a program is completed, the finished program will be executed by chaining to NEOPAL (BASIC8-43).

Mass storage is required.

Paper Tape: $2.00

BASIC8-58
RESEQUENCE (A revision of DECUS8-402)
Original Source: Howard Wolfington
Revised by: Timothy M. Sigmon

This is a revision of DECUS 8-402 which resequences line numbers and references within a BASIC program on TSS/8. It has been revised to handle the following TSS/8 extended BASIC options: 'OPEN-ELSE,' 'ON-GOTO,' 'PUT,' and 'GET' statements and the backslash option.

Language: PAL-D

BASIC8-59
STORM3
Source: Bradford A. Morse

This is a program written in BASIC on Edusystem-20, to simulate formations of clouds, rain storms, and the breakup of the clouds after the rain. It requires only that you can type it into the computer (PDP-8/E), and type the word "RUN ". It will take it from there. The program works entirely with random numbers and simulates buildups and breakdowns of clouds by printing progress reports by the hour until the storm is over. After the storm a complete description of the storm's actions are printed out.

BASIC8-60
WORDSEK, WRDGES, LIFE, LIFES1, TICTAC
Source: Christopher Kryzan, Gordon Speer

1. WRDSEK, given the words to be used, will construct a 15 by 15 word search puzzle. The computer will use the number of words you specify, place them in the puzzle at random locations and in random directions, and then print out a word list, solution, and the puzzle.

2. WRDGES will play 'guess the word' with the user. The user will be able to determine the word size (up to 50 characters) and the time in which he has to look at the word. The computer will then generate the word, let the user look at it for the given amount of time, then totally eradicate the word, and ask him what it was.

3. LIFE is a computerized demonstration of Conway's Game of Life as found in Scientific American. This program illustrates the mathematical patterns which result as the organisms on the grid grow and die. Random or determined starting positions of organisms may be used, and the program terminates itself when it has reached an equilibrium.

4. LIFES1 is another version of Conway's 'LIFE.' It works with teletype output.

The population occupies a grid up to 35 wide by 60 long. Excess height is automatically trimmed to save paper. Changes in the population are counted and the run stops automatically when the population reaches a stable pattern.

5. TICTAC will play the game of tic tac toe against the user, trying to pick the move which is most advantageous to the computer. If the operator makes the first move, the computer will play defensively. If the computer makes the first move, it will play offensively. The board is printed out after the computer's move.

Paper Tapes: $2.00 per routine

BASIC8-61
Bowling League Tabulator
Source: Philip Bujalski

This program automates the tabulation of a bowling league for any amount of teams with any amount of bowlers on the teams. For each bowler, total pinfall, total games, average, high game, low game and high triple are calculated.

Paper Tape: $2.00

BASIC8-62
NANCY.BA
Source: Peter W. Dowrick

This program, written in OS/8 BASIC, simulates the playing of tic tac toe, with randomization of differing strategies and blunders, at four different levels of probability.

Paper Tape: $2.00

BASIC8-63
MAMII and MAMID
Source: F. G. McIntosh

"MAMII" - input version, "MAMID" - data version. The programs provide the functions of addition, multiplication and inversion using either 'input' statements of 'read' and 'data' statements. Both programs allow retention of solutions so that 'chain-type' calculations may be performed. Real matrices only.

Paper Tape: $2.00

BASIC8-64
NAMES
Source: Malcolm Slaney

This is a simple program to punch out names and other messages on tape. Messages of any size that can be handled by the LINPUT command will be punched. It is also possible to specify whether the letter or the background should be punched. All alpha-numeric characters can be punched, and new characters, such as Christmas trees, are easy to add.

Paper Tape: $2.00

BASIC8-65
Butler Area School District Computer Mathematics Series
Source: Keith Henry, John Koehring, Albert Stewart

A series of mathematics programs for individual testing on math problems at various levels. Provisions are made for alternative questions for "retakes" at each level. Complementary programs allow for printout of sets of problems on spirit ditto masters and for the teacher to get an answer sheet for the ditto handout. An achievement ideograph program gives explicit student achievement records.

Language: TSS/8 BASIC
Documentation: $1.00
DTA $8.00 User Supplied, $20.00 DECUS Supplied

BASIC8-66
CLILAC, LILAC Conversion
Source: Brett Fleisch

This version of LILAC (BASIC8-39) retains all the original commands, but is modified for EDU-25 BASIC. The number of lines has been reduced due to the occasional usage of the SHIFT/L command. Its highest line number is less than 2046. Also, two additional useful commands have been added.

Minimum Hardware: 8K PDP-8/E, TTY
Language: EDU-25 BASIC
Paper Tape: $2.00

BASIC8-67
TSSTLK - BASIC Language Communications Package for the TSS/8
Source: Reed Christiansen

TSSTLK utilizes a data file, TSSTKF, to transmit and receive messages to and from other terminals.

BASIC8-68
BASIC Storage
Source: Sandra A. Howell

BASIC Storage is a program written in the 8K BASIC language to accept an integer from the teletype and convert it to its 27 bit floating point equivalent. The integer is restricted to numbers between E ± 38 and can be input as integers, decimal integers, or integers expressed in E format. The output is the octal of words 1, 2, and 3 respectively, in the floating point accumulator.

Language: 8K BASIC

BASIC8-69
CHESS
Source: Andy Kent

Allows two people to play a game of chess using a computer as a board and a move recorder. The computer does not check for illegal moves. When the game is over, the computer prints the final position and every move for both white and black that was made.

Minimum Hardware: PDP-8/M and TTY
Other Programs Needed: EDU-25
Storage Requirement: 12K
Language: BASIC
Paper Tape: $2.00

BASIC8-70
PISTOL - Practically Instantaneous Scheduling Typed On-Line
Source: Andrew R. Bradbury

PISTOL is a BASIC source program devised to rapidly produce student schedules for various uses. It was originally designed to schedule student usage of a computer terminal, but may be used for many other scheduling problems.

Minimum Hardware: TSS/8, Disk storage (Could be modified to use DECtape)
Other Programs Needed: BASIC with data file capabilities
Language: BASIC
Paper Tape $2.00

BASIC8-71
CALC
Source: Jesse Heines

CALC allows you to input any valid BASIC numerical expression and prints out the value of that expression on a CLASSIC or OS/8 system.

This program uses one BASIC language program to write another, CHAINs to a newly written program, and then CHAINs back to the original one.

Paper Tape: $2.00

BASIC8-72
Great Circle Course and Distance
Source: G. Brent Dalrymple

This program computes the great circle distance, the initial course angle, and the initial great circle course from the latitude and longitude of the points of departure and destination.

Minimum Hardware: 8K PDP-8, DECtape, keyboard terminal
Other Programs Needed: OS/8
Language: OS/8 BASIC (Version 3.0)
Paper Tape: $2.00

6. SURPLT (Surface Plotter) attempts to plot a "bird's eye view" of a surface defined by a function of the form Z = f(X,Y). The graph somewhat resembles a topological map, where the letters used in the graph indicate the relative "height" of the range. The output is not printed in three-dimensional perspective.

Hardware Required: PDP-8/E, TTY
Other Software Required: EDUsystem 20 (1973) single user
Source Language: EDUsystem 20 BASIC
Paper Tape: $2.00
Write-up: $1.00 (when ordered without tapes)

BASIC8-84

PLOTTY - A Program to Plot a Function On a Teletype
Source: Jorge Paloschi, Argentina

This program plots through a teletype any one variable function, printing the axis if they are within the plotting domain.

It allows the user to choose the graph scale and also to apply a function to the ordinates (as to get semilogarithmic graphs, for example).

The program was designed to minimize the graph printing time.

Core Storage Required: 8K
Hardware Required: PDP-8 and TTY
Other Software Required: 8K BASIC Interpreter
Source Language: 8K BASIC
Paper Tape: $2.00

BASIC8-85

BASIC FOOTBALL

C. R. Desper
Army Materials and Mechanics Research Center,
Watertown, MA

The program matches the operator against the computer in a simulated football game, running under BASIC-8. The offensive team may select from six plays, plus punt and field goal attempt, while the defense is chosen from four patterns, plus attempted block of kicks. Play is timed against a software "clock"; each side is allowed three "time outs" per half. The duration of the game is four quarters, with additional periods in the event of a tie score. Actual time for a game averages 40-60 minutes.

Core Storage Reauired: 8K
Paper Tape: $2.00

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
FOCAL8-301	U/W FOCAL
FOCAL8-313	EAE Patches to FOCAL
FOCAL8-319	FOCLAB - A Language for Computer Controlled Psychology Research
FOCAL8-325	FWNO - FOCAL WRITE NULLS OVERLAY

II. TEXT EDITING, TEXT MANIPULATION

FOCAL8-311	SIXPAC

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

FOCAL 8-2	XOD Modification For Use with Focal
FOCAL8-269	FX Function for Random Access Files
FOCAL8-293	Laboratory & Real Time Patch with FNEW FOCAL
FOCAL8-329	FOCAL Generates Binary

IV. BINARY LOADING, BINARY PUNCHING

FOCAL8-98	FOCAL Punch Overlay
FOCAL8-215	FOCAL 1969 OCTYL Loader
FOCAL8-219	Keyboard controlled High Speed Punch Routine
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69
FOCAL8-272	Punched Paper Tape Generator with Automatic Randomization
FOCAL8-289	TTY Pun-FOCAL Patch

DECUS NO.	TITLE
FOCAL8-293	Laboratory & Real Time Patch with FNEW FOCAL
FOCAL8-329	FOCAL Generates Binary

V. DUPLICATION, VERIFICATION

DECUS NO.	TITLE

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

FOCAL8-309	DBCONV, Decimal-Binary Converter
FOCAL8-313	EAE Patches to FOCAL
FOCAL8-320	WALLIS and INTCAL

VII. UTILITY

FOCAL8-312	CVFCPTG (Centronics Vertical Format Control Paper Tape Generator
FOCAL8-325	FWNO - FOCAL WRITE NULLS OVERLAY
FOCAL8-329	FOCAL Generates Binary

VIII. DISPLAY

FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971

IX. DATA MANAGEMENT, SYMBOL MANIPULATION SORTING

DECUS NO.	TITLE
FOCAL8-7	Strip FOCAL-Storage of Data Arrays
FOCAL8-180	FOCAL-SORT
FOCAL8-210	Chain and FCOM
FOCAL8-234	Action Indicator Calculator

X. PROBABILITY, STATISTICS, CURVE FITTING

DECUS NO.	TITLE
FOCAL8-308	Fisher's F, Student's t and Chi Squared Distribution
FOCAL8-314	Y-Value Calculations
FOCAL8-315	YORK2 - Two Error Linear Regression with Correlated Errors
FOCAL8-330	SIMPLE

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

FOCAL8-315	YORK2 - Two Error Linear Regression with Correlated Errors
FOCAL8-318	ACTIV1 - Irradiation Time Calculation for a Desired Radioisotope Activity
FOCAL8-319	FOCLAB - A Language for Computer Controlled Psychology Research
FOCAL8-321	Probit Analysis
FOCAL8-322	VDW - Van Der Waal's Equation of State
FOCAL8-323	TDES - Transformer Design
FOCAL8-324	PCOL - Pipe Column Selection
FOCAL8-326	LCRU - LC Resonance with Units
FOCAL8-327	DEWP - Pressure Dewpoints
FOCAL8-328	CONVM

XII. HARDWARE CONTROL

FOCAL8-312	CVFCPTG (Centronics Vertical Format Control Paper Tape Generator)

XIII. GAME, DEMONSTRATION

FOCAL8-300	Computer Bowl
FOCAL8-302	XSTOCK - Stockmarket Simulation Game
FOCAL8-303	STKMKT - Stock Market Game
FOCAL8-304	Tic-Tac-Toe
FOCAL8-305	RUBEN
FOCAL8-306	FOCAL Baseball
FOCAL8-307	Casino, Demos, Bombing Mission, Double Hangman
FOCAL8-316	BANCPO - Bank Portfolio Simulation
FOCAL8-317	UFO-24 - A Dynamics Simulation Game

XIV PLOTTING

DECUS NO.	TITLE
FOCAL8-4	Prime Plots
FOCAL8-12	QUIP1: Quick Plot in Quadrant 1
FOCAL8-13	3-D Plotter
FOCAL8-84	2D Plotter Patch for FOCAL 69
FOCAL8-97	Multiple Equation Graphing on a Teletype
FOCAL8-126	PLOTTER
FOCAL8-195	All Purpose Graphing Program

XV. DESK CALCULATOR, BUSINESS APPLICATION

FOCAL8-316	BANCPO - Bank Portfolio Simulation

XVI. MAINTENANCE

XVII. MISCELLANEOUS

FOCAL8-85	Program Replication
FOCAL8-87	Keyboard Readable Punch
FOCAL8-155	FACTORS
FOCAL8-161	Wilmot Grading Program
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL, 1969
FOCAL8-258	Hearing Loss Simulator

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FOCAL8-300	Computer Bowl	D01, G02
FOCAL8-301	U/W FOCAL	A01, B13, F10, G16, H12, J11
FOCAL8-302	XSTOCK - Stockmarket Simulation	D01, F02, G02
FOCAL8-303	STKMKT - Stock Market Game	D01, G02
FOCAL8-304	TIC-TAC-TOE	D01, G02
FOCAL8-305	RUBEN	D01, G02
FOCAL8-306	FOCAL Baseball	D01, G02
FOCAL8-307	Casino, Demos, Bombing Mission, Double Hangman	A01, G06, W00
FOCAL8-308	Fisher's F, Student's t and Chi Squared Distributions	D01, G02
FOCAL8-309	DBCONV - Decimal-Binary Converter	D01
FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971	D01, G06
FOCAL8-311	SIXPAC	D01, F02, G02
FOCAL8-312	CVFCPTG (Centronics Vertical Format Controlled Paper Tape Generator)	D01, G02
FOCAL8-313	EAE Patches to FOCAL	D01, F02, G06
FOCAL8-314	Y-Value Calculations	D01, G02
FOCAL8-315	YORK2-Two Error Linear Regression with Correlated Errors	D01, G02
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FOCAL8-328	CONVM: Interconversion of Mass and Volume Units	D01, G02
FOCAL8-329	FOCAL Generates Binary Patches and Disassembles Binary Tapes	D01, G02
FOCAL8-330	SIMPLE: The Simple Method to Fit Equations to Data	D01, G02

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NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-300	$ 1.	$	$2.	$ Inc.	$	$	$	$	$	$	
FOCAL8-301	1.	16.	40.	25.	8.	20.	8.	18.			1 DTA, 1 LTA
FOCAL8-302	1.	2.	2.	Inc.							Both tapes needed to run program
FOCAL8-303	1.		2.	Inc.							
FOCAL8-304	1.		2.	Inc.							
FOCAL8-305	1.		2.	Inc.							
FOCAL8-306	1.		2.	Inc.							
FOCAL8-307	1.		8.								
FOCAL8-308	1.		2.	Inc.							
FOCAL8-309	1.			Inc.							
FOCAL8-310	1.		8.	Inc.							
FOCAL8-311	1.	2.	2.	Inc.							
FOCAL8-312	1.		2.	Inc.							
FOCAL8-313	1.	2.	8.	Inc.							
FOCAL8-314	1.		2.	Inc.							
FOCAL8-315	1.		2.	Inc.							
FOCAL8-316	1.		2.	Inc.							
FOCAL8-317	1.		2.	Inc.							
FOCAL8-318	1.		2.								
FOCAL8-319	2.	2.		On tape	8.	20.					1 DTA (obj, src); 1 Floppy Disk $8/20
FOCAL8-320	1.			Inc.							
FOCAL8-321	1.		2.	Inc.							
FOCAL8-322	1.		2.	Inc.							
FOCAL8-323	1.		2.	Inc.							
FOCAL8-324	1.		2.	Inc.							
FOCAL8-325	1.			Inc.							
FOCAL8-326	1.		2.	Inc.							
FOCAL8-327	1.		2.	Inc.							
FOCAL8-328	1.		2.	Inc.							
FOCAL8-329	1.		2.	Inc.							
FOCAL8-330	1.		2.	Inc.							

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO. FOCAL8-300

Computer Bowl

Dolores Sochacki, A. B. Dick, Chicago, Illinois

The program is one in which the user participates by rating himself as to his bowling skill. The number of pins knocked down in each frame is a function of the DEC random number generator (FRAN ( )) and the users' bowling rating of his skill.

The number of pins per ball, strike or spare and the calculated score are all displayed on whatever terminal is available.

Storage Requirement:	4K (without extended functions)
Source Language:	FOCAL '69

DECUS NO. FOCAL8-301

U/W FOCAL

Jim Van Zee, University of Washington, Seattle, Washington

U/W FOCAL is an expanded version of PS/8 FOCAL (FOCAL8-177) which offers 13 new commands (including 2 unused ones), 15 more function entries (30 altogether), and many other improvements, all in the same amount of core space! Among the new features are FOCAL Statement Functions, double subscripting, variable file names, decrementing loops, the constant PI, new EAE routines for the 8/E (and older machines too), several improved functions, a command for printing the date and a way to use the teletype as a giant switch register. This version of FOCAL offers exceptional flexibility for laboratory applications as well as greatly enhanced performance for purely numerical problems. 10-digit precision (a unique feature of FOCAL) is standard.

Minimum Hardware:	OS/8, PS/8 or OS/12 Configuration
Other Programs Needed:	Operating systems to support configuration
Storage Requirement:	8K
Restrictions:	1-page I/O Handlers
Miscellaneous:	Individual files are available on paper tape. Contact DECUS for charges
Source Language:	PAL-8

DECUS NO. FOCAL8-302

XSTOCK - Stockmarket Simulation Game

Alvin Yellon and Mike Benveniste, Computonostra Programming Club, Highland Park, Illinois

The program simulates the actual stock market as closely as possible. The user has a choice of seven stocks in which to buy or sell shares. The price of a share rises or falls randomly, using a FNEW random number function, within a range of ± 5 dollars. The brokerage fee and stock index are calculated by following the actual exchange procedure as closely as possible. The program is also set up so that at any given time, any stock can undergo a 2 for 1 split. The output includes price, holdings, change, percent change, and any dividend paid.

Minimum Hardware:	4K PDP-8, ASR-33
Restrictions:	Runs only under FOCAL-69 without extended functions. Square root function cannot be called when overlay is in use.
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-303

STKMKT - Stock Market Game

Philip J. Hunt, Middletown Township High School, Middletown, New Jersey

This game makes you the buyer in an imaginary stock market. You may buy or sell in a field of 10 stocks on this market. The computer keeps track of your purchases, your money on hand, and the changing stock prices.

A feature of this game is that you type in the names of your 10 stocks, 9 letters (or characters) per name.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	DECUS FOCAL8-52a and FOCAL8-189
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-304

TIC-TAC-TOE

William R. Murray, Arlington, Texas
Submitted by: Diane Drum, Digital Equipment Corporation, Maynard, Massachusetts

A short tic-tac-toe program for FOCAL 5/69 (DECUS FOCAL8-52a). Program always plays center square when given several options, otherwise picks squares at random. However, it does not play blindly and will either play to win or to block a win.

Minimum Hardware:	4K PDP-8 without extended functions
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-305

RUBEN

James R. B. Howard II and Jimmie B. Fletcher, AIL Information Systems, APO New York

A modification of the "King of Sumeria" game. Problems with the random number generator have been corrected and some additional features have been added.

Minimum Hardware:	8K PDP-8/I, ASR33
Other Programs Needed:	FOCAL 1969 with 8K overlay
Source Language:	FOCAL

DECUS NO. FOCAL8-306

FOCAL BASEBALL

Philip Hunt, Middletown TWP High School, Middletown, New Jersey

This program lets you play a game of baseball against the computer. It has all the rules normally seen in a game of baseball, and many of the plays seen in the game including: walk, ball, strike, strike-out, foul balls, 9 types of hits, catches, 9 types of pitches, wild pitches, runners stealing, pick-off tries at any base, batter hit by patch, caught foul balls and others.

Minimum Hardware:	8K PDP-8/S, TTY, High speed reader recommended
Other Programs Needed:	DECUS FOCAL8-52a and 8K overlay patch (DECUS FOCAL8-189)
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-307

Casino, Demos, Bombing Mission, Dougle Hangman

Philip Hunt, Middletown Township High School, Middletown, New Jersey

A group of games and demonstration programs which utilize FOCAL 5/69 (FOCAL8-52a) and its 8K overlay (FOCAL8-189).

Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-308

Fisher's F, Student's t and Chi Squared Distributions

Thomas V. McCaffrey, Stritch School of Medicine, Loyola University, Maywood, Illinois

Two FOCAL coded programs written to calculate the probability distributions of three statistical functions: Fisher's F, Student's t and Chi squared. The first program calculates both the F and t distributions. The second program calculates the Chi squared distribution.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL '69

DECUS NO. FOCAL8-309

DBCONV, Decimal-Binary Converter

Bob Kelley, 5 Atlantic Avenue, North Providence, Rhode Island

DBCONV is a simple program written in the FOCAL 5/69 language which will convert decimal numbers of up to 6 decimal digits to binary integers of up to 24 bits precision and up to 72 bits in length. Leading zeroes are suppressed in the output. Negative numbers are taken as their 12-bit 2's complement.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL 5/69 (DECUS FOCAL8-52a)
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-310

Overlay for KV8I - OMSI FOCAL 1971

Michael B. Erickson, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This overlay provides OMSI FOCAL 1971 with graphics display capabilities, through the functions FDIS and FJOY as described in the PS/8 FOCAL, 1971 user guide. Also character display, using the variable stroke character generator, of text is also provided. This patch requires at least 12K of memory, since it takes advantage of the fact that OMSI FOCAL only resides in 8K memory.

Minimum Hardware:	OS/8 configuration with KV8I/VT01 Storage Scope
Other Programs Needed:	OMSI FOCAL '71 (FOCAL8-177)
Storage Requirement:	12K
Source Language:	PAL-8

DECUS NO. FOCAL8-311

SIXPAC

Richard Small, Federal Products Corporation, Inc., Providence, Rhode Island

SIXPAC reads, echoes, and packs characters into variable storage with a density of six (6) characters per variable, types them in the form entered, and does not require pre-assignment of core for character storage. Entering, editing and typing the six character blocks is done during execution of a FOCAL program.

Minimum Hardware:	PDP-8/E
Other Programs Needed:	FOCAL/F, paper tape version (FOCAL8-227a)
Storage Requirement:	172 octal words (on one page)
Source Language:	PAL III

DECUS NO. FOCAL8-312

CVFCPTG (Centronics Vertical Format Control Paper Tape Generator)

W. E. Hamilton, 212F Red Oak Drive East, Sunnyvale, California

This is a FOCAL coded utility program which will produce vertical format control (carriage control) tapes for a Centronics printer.

Minimum Hardware:	4K PDP-8/I, ASR33
Restrictions:	Cannot be run with extended functions
Source Language:	FOCAL '69

DECUS NO. FOCAL8-313

EAE Patches to FOCAL

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

These are Mode "B" Extended Arithmetic Element patches to two versions of the FOCAL language, namely to DEC's FOCAL-8, the revision of FOCAL, 1969, and to DECUS' FOCAL 5/69 ("Taft" FOCAL).

Mode "B" of the EAE is available only on PDP-8/E and later models. The PDP-12 and the PDP-8/I EAE run in mode "A" only. It is likely that some parts of the patches might be recodable into mode "A".

The patch to DEC's FOCAL-8 does things to the addition routines as well as to the floating multiply and divide routines. The other patch restricts itself to floating multiply and divide only. On a sample program calculating a lot of arc sines, the FOCAL-8 patch caused the program to run in about 40% less time than was required with unpatched FOCAL-8; the TAFT patch saved about 30% as compared with unpatched FOCAL 5/69.

It should be remembered that both languages are interpretive and use interpretive calls to their floating point packages. A substantial fraction of the run time of a program is determined simply by the language structure.

Source Language:	PAL-8

DECUS NO. FOCAL8-314

Y-Value Calculations

G. Brent Dalrymple, U. S. Geological Survey, Menlo Park, California

This program calculates values of Y using any of eight different equations given the coefficients of the equation selected and values of X. A ninth option allows the user to enter any equation of his or her choice. The equations available are: (1) $y = a + bx$, (2) $y = a + b/x$, (3) $\ln y = a + bx$, (4) $\ln y = a + b \ln x$, (5) $y = ab^x$, (6) $y = ax^b$, (7) $y = a + be^x$, and (8) $y = a + bx + ce^{dx}$.

Minimum Hardware:	8K PDP-8, keyboard terminal
Other Programs Needed:	FOCAL-8
Source Language:	FOCAL-8

DECUS NO. FOCAL8-315

YORK2 - Two Error Linear Regression with Correlated Errors

G. Brent Dalrymple, U. S. Geological Survey, Menlo Park, California

YORK2 is a linear regression program that allows for errors in both X and Y and also for positive and negative correlation of the X and Y errors. The program accepts errors for each value of X and Y. If the errors are uncorrelated, the correlation coefficient ($-1 \leq R \leq 1$) may be set to zero. Output consists of the slope, the intercept, the coordinates of the centroid and six statistical parameters. The program uses the "least squares cubic" method of D. York, University of Toronto (York, 1969). It requires 8K of core.

Minimum Hardware:	8K PDP-8, keyboard terminal
Other Programs Needed:	8K FOCAL-8
Source Language:	FOCAL-8

DECUS NO. FOCAL8-316

BANCPO - Bank Portfolio Simulation

Dr. John A. Tribble, Newberry College, Newberry, South Carolina

This routine simulates the decision making process of the commercial banker, a risk-filled and uncertain world where there is interdependency of bankers' decisions. General data is entered describing a banking market with five competitors. Each of the five competing banks enters a level of government securities, an initial net worth, and interest rates paid on savings accounts, paid on certificates of deposits, and charged on loans. The program calculates assets and liabilities for each bank adjusting assets to meet required reserves. The output consists of a balance sheet for the last day of the decision period and an income statement for the period.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL, 1969 & INIT
Restrictions:	Extended functions removed from FOCAL
Source Language:	FOCAL

DECUS NO. FOCAL8-323

TDES - Transformer Design

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program calculates the turns and wire size required for an audio transformer. The method is based on the article by Ed Francis in Popular Electronics, September 1970, page 78. Wire sizes are calculated on the basis of 800 c.m./A.

Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-324

PCOL - Pipe Column Selection

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program selected the lightest standard pipe which will carry a given eccentric load for a given height. Schedule 40 and Schedule 80 pipes from 1 to 12 inches are included in the data table. The program returns the size and schedule of the pipe having the least area (or weight) which will give a maximum stress less than 20,000 psi.

The usual engineering judgments must be made in selecting the input data. For example, the column length must be the Euler length, which depends on the mode of support for the particular column. Care must also be taken in the selection of eccentricity values, as values near zero are unrealistic. The secant formula is used for computing the maximum stress; limitations to the use of this formula must be observed.

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-325

FWNO - FOCAL WRITE NULLS OVERLAY

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc. Amarillo, Texas

This short overlay (13 words) to FOCAL-69 modifies the WRITE command to output three nulls after every line. This produces a program tape with three frames of blank tape between program lines. As blank tape is ignored by the input routine, program tapes produced using this overlay do not require periodic stopping of the low-speed reader on input.

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Source Language: FOCAL
Restrictions, Deficiencies, Problems: Will not work with 8K overlay, only with 4K overlay

DECUS NO. FOCAL8-326

LCRU - LC Resonance with Units

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program calculates F, L, or C from the other two known values, with units specified. Result will be converted to consistent units for output. Acceptable units are as follows:

Value	Units
F	HZ, KHZ, MHZ, GHZ
L	H, MH, UH, NH
C	F, UF, PF

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-327

DEWP - Pressure Dewpoints

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc. Amarillo, Texas

This program calculates the new dewpoint of air of a specified dewpoint when compressed from local atmospheric pressure to a higher pressure. The output of this program is a table of dewpoints.

Monitor/Operating System: FOCAL '69
Core Storage Required: 4K
Hardware Required: Console TTY
Other Software Required: FOCAL '69
Source Language: FOCAL '69

DECUS NO. FOCAL8-328

CONVM: Interconversion of Mass and Volume Units

Barry L. Johnson, Ph.D.
National Institute for Occupational Safety and Health, Cincinnati, Ohio

Program CONVM is a program written in U/W FOCAL (DECUS-301) for the purpose of providing quick interconversions between mass and volumetric units for gases. As an example, convert 100 parts per million of carbon monoxide to its equivalent in units of milligrams per cubic meter. CONVUM contains a library of the more common elements and permits the user to enter the chemical structure of the compound if the molecular weight is not known. By using the ideal gas law , the program computes the interconversion of units from mass to volumetric, or vice versa, over a range of values and prints the results on the teletypewriter.

Monitor/Operating System: OS/8
Core Storage Storage Required: 8K

June 1976

DECUS NO. FOCAL8-328 (CONTINUED)

Hardware Required:	Teletype or DECwriter
Other Software Required:	U/W FOCAL (DECUS FOCAL8-301)
Source Language:	U/W FOCAL

DECUS NO. FOCAL8-329

FOCAL Generates Binary Patches and Disassembles Binary Tapes

Aldo F. Roman
Don Bosco Technical High School, Paterson, New Jersey

The first part of the program is similar to DECUS NO. FOCAL8-206, with these added advantages:
a- no need of carriage return or space.
b- possibility of entering field settings
c-application of standard symbols, as * and $ used in machine language
d- avoid overflow in checksum caused by long patches
e- increased speed
In its second part it disassembles, in octal format, a binary tape, for checking purposes.

Core Storage Required:	4K
Hardware Required:	PDP-8, ASR33
Other Software Required:	FOCAL 5/69, (DECUS FOCAL8-52a)
Source Language	FOCAL 5/69

DECUS NO. FOCAL8-330

SIMPLE: The Simplex Method to Fit Equations to Data

G. H. Lameris - Author
J. Schram - Submitter
University of Technology Delft, Delft, The Netherlands

This program fits any equation to any set of data. Its only restriction is the amount of core required. If the extended functions are retained in 4K, there is only room for 50 variables, after the program has been loaded. The user's equation and the variables the program needs will soon exceed this amount of core. Without the extended functions the program can handle 20 pairs of data or a complicated equation.
The user has to write his equation and to load his data into core himself.

Core Storage Required:	4K
Other Software Required:	FOCAL 5/69, PS/8 FOCAL'71 (8K machines only)
Restrictions, Deficiencies, Problems:	Not very useful when extended functions are retained (with 4K machines only.)

C-1 CLASSIC APPLICATION PACKAGE

No.	MEDIA/PRICE CODES
C-1	D01, K14
C-1A	D01, K09
C-1B	D01, K09

The programs in this Applications Package are taken from three major areas of study: Statistics, Mathematics and Chemistry. It includes such programs as LESQ (DECUS No. 8-661, written in FORTRAN), which will perform a GAUS-Newton method of least squares analysis; PERIOD (DECUS No. BASIC8-40, written in BASIC), which is an interactive quiz on the periodic table of the elements; and MATMUL (DECUS No. 8-75, written in FORTRAN), which will multiply any two matrices. The package also includes some function subprograms and subroutine subprograms, written in FORTRAN, which will be of use to the user.

This package is offered on two diskettes (floppy disks).

C-1A contains 40 FORTRAN routines and is accompanied by pertinent documentation.

C-1B contains 38 BASIC routines and is accompanied by pertinent documentation.

ENG-1 CMS/1 APPLICATIONS PACKAGE

This is a compilation of statistical and mathematical programs originally submitted to DECUS by individual members. They are combined here on a floppy diskette for convenient use on the CMS/1.

The programs in the package are written in FORTRAN compatible with OS/8 and FORTRAN IV, and include the following functions: Fourier Transform, correlation, standard deviation, cluster analysis, analysis of variance, general non-linear least squares, curvilinear regression, orthogonal regression, cumulative Gaussian distribution curve fitting, J. Bessel function matrix, Eigenvalues and Eigenvectors.

MEDIA/PRICE CODES

A02, K09, W00

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
12-10	FOCAL Library (LINCtape FOCAL for the PDP-12
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-45	FOCALP-FOCALPE
12-48	PS/8 FORTRAN Library Routines
12-54	QUIP - Quick Assembler for the PDP-12
12-61	Generating Random Numbers with FOCAL
12-67	PPG FOCAL
12-77	PAL12A Assembler
12-80	FOCAL - RT
12-101	OS/8 SKED
12-108	FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-110	DIAL-MS for 1600 Blocks
12-120a	DUAL
12-124	FR, FDIS and FADC for PDP-12 Input/Output
12-129	OS/12X Scope Monitor Operating System
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8, OS/12
12-134	RWDF32
12-135	MAC8, 8K MACRO ASSEMBLER
12-137	PAL12D
12-138	ISEL
12-153a	DUAL32, DUAL-28K Assembler
12-154a	CREF32
12-164	DIAL.EXT
12-167	FOCAL Patches
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-178	NUFOCAL, Modified FOCAL-12
12-180	CARDDIAL - Input to the DIAL Editor Via Cards
12-186	COBRA Assembler for the PDP-12
12-188	4K DISK/LINCTAPE MONITOR
12-189	DECtape Reader Handler for PDP-12
12-191	MTXIO - Multitasking Executive

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
12-6	ANDIP - Analog Digital Interchange Program
12-39	QUANAT 1
12-50	EDIT-12
12-66	ADDINDX (LAP6-DIAL-MS Index
12-82	LAP6-DIAL to PS/8 Source File Converter
12-96A&B	SCOPE and CNGMWA
12-163	AD74 - High Speed Analog to Digital Conversion Program

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

12-11	ODTAPE (Octal Debugger for PDP-12 LINCtape)
12-21	Modified MAGSPY
12-30	TDUMP
12-76	TAPELOOK; CORELOOK; SEARCH
12-91	OCTPUNCH
12-124	FR, FDIS and FADC for PDP-12 Input/Output
12-142	FOCALSD
12-154a	CREF32
12-162	COREDIT

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
12-17a	DIALRFØ8
12-20	FORMATXT
12-152	LOAD31K, A Loader for DIAL-MS and 32K of Core

V. DUPLICATION, VERIFICATION

12-18	"FAILSAFE"
12-32	COMPAR12
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIPIØ: PDP-10 DECtape to LINCtape Converter

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

DECUS NO.	TITLE
12-7	DBLFLT - Double Float Mathematical Routines
12-14	MUL-2REG
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C
12-34	STAP-12
12-41	BLOOPD - Blood Pressure Display Program
12-64	Walsh Transform Subroutines, PWALSH and LWALSH
12-67	PPG FOCAL
12-68	A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor
12-88	OCTALFPP
12-89	BUTFLTR
12-90	REPRSNT
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine
12-183	DECIO - FOCAL-12 Whole Word Digital I/O Overlay
12-201	DPSPV3: Double Precision to Single Precision Integer Conversion

VII. UTILITY

DECUS NO.	TITLE
12-2	PDP-12 Utility and Data Reduction Programs
12-8	Teletype Conversion Routines
12-9	SLOWCREF
12-13	RDPEC: PEC Synchronous Tape Read Program
12-21	Modified MAGSPY
12-24	Overlays to FOCAL-12
12-31	DCON-10
12-56	QANDA+ - Modified QANDA Subroutine
12-57	SPY+ - Modified MAGSPY
12-58	FIFOCON
12-66	ADDINDX (LAP6-DIAL-MS Index Manipulator)
12-79	Modified ADTAPE
12-81	VR12 SCOPE HANDLER FOR OS/8
12-87	ONDISK-OFFDISK
12-89	BUTFLTR
12-92	PDP8TO12
12-93	TRANS
12-95	PDP-12 PS/8 Utility Programs
12-107	AVUPTO8, AVUPTO8S
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-117	TAPEDIT, A PDP-12 LINCTAPE EDITOR
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-122	PDP-12 User's Monitor Command
12-123a	OS/8 VR12 Handler
12-130	COMPARE - Fast LINCtape Compare
12-131	OS/8 DIBILD - Revised
12-136	MOVE
12-142	FOCALSD
12-143	DSLIS - Dead Start Loader and Index Statistics
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-145a	CREFNMAP
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape
12-154a	CREF32
12-155	MARK12XØ
12-158	FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's
12-160	CCTGEN - Carriage Control Tape Generator
12-172	WVU Utility Package
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-189	DECtape Reader Handler for PDP-12
12-190	PDP-12 Functions for OS/8 BASIC
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12
12-196	TRALIB - Point Process Data Library and Editor
12-197	SUPRQA - Super QANDA
12-199	CPRINT: Utility Subroutine
12-200	MUHT-PS2

VIII. DISPLAY

DECUS NO.	TITLE
12-6	ANDIP - Analog Digital Interchange Program
12-21	Modified MAGSPY
12-33	KWANDA
12-37	ODCAD (Octal to Decimal Conversion and Display)
12-39	QUANAT 1
12-41	BLOOPD - Blood Pressure Display Program
12-51	MAGSPYD
12-57	SPY+ - Modified MAGSPY
12-71	Snoopy Display Program
12-76	TAPELOOK; CORELOOK; SEARCH
12-103	$HAPPY
12-109A,B,C	QNANSWER, QANDTTY, SUPRSHUF
12-115	PLOT3D, Pseudo 3-Dimensional Perspective Display for the PDP-12
12-123a	OS/8 VR12 Handler
12-125	Waveform Analysis
12-126	WAVEFORM: Evoked Potential Analysis
12-157	PLOTVS, Device Independent Graphics
12-161	BIGCHARS
12-162	COREDIT
12-166	OS/8 VC12 Display Device Handler for the PDP-12
12-167	FOCAL Patches
12-173	SCOPEFOCAL
12-181	ATSXL - Text Display and Timing Routine for FOCAL-RT

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

DECUS NO.	TITLE
12-12	8TO12 File Converter
12-34	STAP-12
12-46	STRINGS
12-47	PIP16ØØ
12-80	FOCAL - RT
12-105	DATAFILE and DFUPDATE
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12
12-139	BURST - WITHDRAWN - See 12-198
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-192	ASFLO - Packed ASCII to Floating Point Format Conversion
12-195	TRIGSYS - A Multichannel Fast Point Process Data Acquisition
12-198	BURST, V2 - A Point Process High-Pass Filter

X. PROBABILITY, STATISTICS, CURVE FITTING

12-34	STAP-12
12-38A	Histogram and One-Factor Analysis of Variance
12-38B	Histogram and Two-Factor Analysis of Variance
12-74	*REGRES - Multiple Linear Regression
12-83	$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN
12-99	A Set of Spectral Programs
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-141	$CORREL - Intercorrelation Program for 50 Variables
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-146	$CORR. (FOCAL Version)
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples
12-148	STATIS12, A Statistical Package for the PDP-12
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12
12-179	The Mann-Whitney U Test
12-194	Split Plot Factorial Analysis of Variance

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

12-1	EEG Data Collection (BNI Series)
12-4	IRDA
12-15	HISTO12
12-22	PLOTFFT
12-23	CFFT
12-34	STAP-12
12-35	Bioelectric Signal Sorter (JULIA)
12-41	BLOOPD - Blood Pressure Display Program
12-43	PLOT3D
12-44	AVERDT
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments
12-55	FFAESIM
12-62	RUFUS
12-63	OLFFT1 and FETCHFFT
12-65	PISH - Poststimulus Time and Interspike-Interval Histogram
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers
12-72	Four-Point Smoothing with FPP-12
12-73	8-Point Quadratic Smooth with FPP-12
12-80	FOCAL - RT
12-89	BUTFLTR
12-94	DATAN
12-97	An Off-Line FOCAL-12 Program for Auto Analyzers by TWX
12-98	HERALD - Analog-Digital Average and Standard Error Program
12-101	OS/8 SKED
12-104	CORDATFP
12-107	AVUPTO8
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-121	Arrhythmia Detection and Categorization
12-125	Waveford Analysis
12-126	WAVEFORM: Evoked Potential Analysis
12-128	GEP: A Generalized Experimental Package
12-139	BURST - WITHDRAWN - See 12-198
12-140	NAEP - Nerve Action and Evoked Potentials
12-144	ANECDOTE - Advanced NauroElectric Computer Data Operational Tape (Export)
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples
12-151	"PSYCHO," A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics
12-163	AD74 - High Speed Analog to Digital Conversion Program
12-165	NAP SYS: Program to Analyze Neuronal Spike Data
12-168	Spectral Analysis System
12-182	KLK - A Simple Clock Overlay for PDP-12 FOCAL
12-184	PPSH - Neuronal Autocorrelation and Crosscorrelation Analysis Programs
12-185	Horoscope Casting Routines - Astrodynami cal Subroutines
12-198	BURST, V2 - A Point Process High-Pass Filter
12-202	PLOT8CH: 3 Dimensional Plotting of EEG DATA

XII. HARDWARE CONTROL

DECUS NO.	TITLE
12-29	LINC-10
12-75	FORTRAN Subroutines for the PDP-12
12-114	FOCAL-PL
12-166	OS/8-VC12 Display Device Handler for the PDP-12
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-187	OS/8 Device Handlers for PDP-12 Core

XIII. GAME, DEMONSTRATION

12-21	Modified MAGSPY
12-36	Hangman for PDP-12
12-60	SUMER (French)
12-71	Snoopy Display Program
12-85	APOLLO 12
12-86	ORGAN-AA and ORGAN+B
12-103	$HAPPY
12-156	MUSIC12
12-159	PLAYBOY
12-161	BIGCHARS
12-177	Tennis
12-185	Horoscope Casting Routines - Astrodynamical Subroutines

XIV. PLOTTING

12-42	CALCO12
12-59	FOCPLOT
12-70	COMPLT
12-78	PUBPLOT
12-84	AVERAGER
12-106	$PLOT
12-107	AVUPTO8, AVUPTO8S
12-114	FOCAL-PL
12-157	PLOTVS, Device Independent Graphics
12-175	PLOTZER
12-202	PLOT8CH: 3 Dimensional Plotting of EEG Data

XV. DESK CALCULATOR, BUSINESS APPLICATION

DECUS NO.	TITLE

XVI MAINTENANCE

12-16	MODCLK

XVII. MISCELLANEOUS

12-5	SERCHPRO
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-49	Cold Start DR32 Disk Formatter for PS/8 on a PDP-12
12-52	Student Test Analysis
12-102	A Manual for the PDP-12 Operator
12-171	Three Patches to the Clinical LAB-12 System
12-174	CLOCK: Digital Clock with Westminster Chimes
12-185	Horoscope Casting Routines - Astrodynamical Subroutines

DECUS NO.	TITLE
12-48	PS/8 FORTRAN Library Routines
12-49	Cold Start DF32 Disk Formatter for PS/8 on a PDP-12
12-50	EDIT-12
12-70	COMPLT
12-95	PDP-12 PS/8 Utility Programs
12-96A&B	SCOPE and CNGMWA
12-101	OS/8 SKED
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-123a	OS/8 VR12 Handler
12-124	FR, FDIS and FADC for PDP-12 Input/ Output
12-129	OS/12S Scope Monitor Operating System
12-131	OS/8 DIBILD - Revised
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine
12-134	RWDF32
12-135	MAC8, 8K MACRO ASSEMBLER
12-136	MOVE
12-137	PAL12D
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter
12-157	PLOTVS, Device Independent Graphics
12-166	OS/8-VC12 Display Device Handler for the PDP-12
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12
12-172	WVU Utility Package
12-187	OS/8 Device Handlers for PDP-12 Core
12-189	DECtape Reader Handler for PDP-12
12-190	PDP-12 Functions for OS/8 BASIC
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12
12-196	TRALIB - Point Process Data Library and Editor
12-198	BURST, V2 - A Point Process High-Pass Filter
12-199	CPRINT. SB: Utility Subroutines for a Centronics 101A Printer
12-201	DPSPV3: Double Precision to Single Precision Integer Converter

DECUS PROGRAM LIBRARY
PDP-12 NUMERICAL INDEX

No.	TITLE	MEDIA/PRICE CODES
12-1	EEG Data Collection (BNI Series)	A01, J11, W00
12-2	PDP-12 Utility and Data Reduction Programs	A01, J11, W00
12-4	IRDA	A01, J11, W00
12-5	SERCHPRO	D01, J11
12-6	ANDIP - Analog Digital Interchange Program	A01, B07, J11
12-7	DBLFLT - Double Float Mathematical Routines	A01, J11, W00 ┐ same LINCtap
12-8	Teletype Conversion Routines	A01, J11, W00 ┘
12-9	SLOWCREF	A01, B07, J11
12-10	FOCAL Library (LINCtape FOCAL for the PDP-12)	D01, J11
12-11	ODTAPE (Octal Debugging for PDP-12 LINCtapes)	D01, J11 *
12-12	8TO12 File Converter	A01, J11, W00
12-13	RDPEC: PEC Synchronous Tape Read Program	D01, J11
12-14	MUL-2REG	D01, J11
12-15	HISTO12	D01, J11 *
12-16	MODCLK	D01, F02, G02
12-17a	DIALRF08	D01, J11
12-18	"FAILSAFE"	D01, F02, G02
12-20	FORMATXT	A01, F02, G02, W00
12-21	Modified MAGSPY	A01, F02, W00
12-22	PLOTFFT	A01, B07, J11 ┐ same LINCtape
12-23	CFFT	A01, B07, J11 ┘
12-24	Overlays to FOCAL-12	D01, J11
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C	A01, J11, W00
12-29	LINC-10	G06, W00, Y00
12-30	TDUMP	A01, B07, J11
12-31	DCON-10	A01, B12, J11
12-32	COMPAR12	A01, B07, J11
12-33	KWANDA	A01, B05, J11
12-34	STAP-12	A01, J22, W00
12-35	Bioelectric Signal Sorter (JULIA)	A01, J11, W00
12-36	Hangman for PDP-12	A01, J11, W00 ┐ same LINCtape
12-37	ODCAD (Octal to Decimal Conversion and Display)	A01, J11, W00 ┘

* same LINCtape; contains 12-11 & 12-15

No.	TITLE	MEDIA/PRICE CODES
12-38A	Histogram and One-Factor Analysis of Variance	D01, J11] same LINCtape
12-38B	Histogram and Two-Factor Analysis of Variance	D01, J11]
12-39	QUANAT 1	A01, J11, W00
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface	A01, J11, W00
12-41	BLOOPD - Blood Pressure Display Program	A01, F02, G06, W00
12-42	CALCO 12	A01, B05, J11
12-43	PLOT3D	A01, J11, W00] same LINCtape
12-44	AVERDT	A01, J11, W00]
12-45	FOCALP-FOCALPE	A01, J11, W00
12-46	STRINGS	A01, J11, W00] * same LINCtape
12-47	PIP-1600	A01, J11, W00]
12-48	PS/8 FORTRAN Library Routines	A01, B07, J11
12-49	Cold Start DF32 Disk Formatter for PS/8 on a PDP-12	D01, J11
12-50	EDIT-12	J11, W00, Y00
12-51	MAGSPYD	A01, B07, J11
12-52	Student Test Analysis	A01, G02, W00
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments	A01, G02, W00
12-54	QUIP - Quick Assembler for the PDP-12	A01, B07, J11
12-55	FFAESIM	D01, F02, G02
12-56	QANDA+ - Modified QANDA Subroutine	A01, B05, J11] same LINCtape
12-57	SPY+ - Modified MAGSPY	A01, B05, J11]
12-58	FIFOCON	D01
12-59	FOCPLOT	D01, J11
12-60	SUMER (French)	D01, J11
12-61	Generating Random Numbers with FOCAL	D01
12-62	RUFUS	A01, J11, W00
12-63	OLFFT1 and FETCHFFT	A01, J11, W00
12-64	Walsh Transform Subroutines, PWALSH and LWALSH	D01, G02
12-65	PISH - Poststimulus Time and Interspike - Interval Histogram	A01, J11, W00
12-66	ADDINDX (LAP6-DIAL-MS Index Manipulator)	A01, J11, W00
12-67	PPG FOCAL	D01, J11
12-68	A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor	A01, B07, J11

* same LINCtape; contains 12-110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers	D01, J11
12-70	COMPLT	A01, H12, J11, W00
12-71	Snoopy Display Program	A01, F02, W00
12-72	Four-Point Smoothing with FPP-12	D01, J11
12-73	8-Point Quadratic Smooth with FPP-12	A01, B05, J11
12-74	*REGRES - Multiple Linear Regression	D01
12-75	FORTRAN Subroutines for the PDP-12	D01, F02, G02
12-76	TAPELOOK; CORELOOK; SEARCH	A01, J11, W00
12-77	PAL12A Assembler	A01, B07, J11
12-78	PUBPLOT	A01, B07, J11
12-79	Modified ADTAPE	D01, F02, G02
12-80	FOCAL - RT	A01, J11, W00
12-81	VR12 SCOPE HANDLER FOR OS/8	A01, J11, W00 } same LINCtape
12-82	LAP6-DIAL TO PS/8 SOURCE FILE CONVERTER	A01, J11, W00 }
12-83	$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN	D01, G02
12-84	AVERAGER	A01, J11, W00
12-85	APOLLO 12	D01, G02
12-86	ORGAN-AA and ORGAN+BA	D01, F02, G02
12-87	ONDISK-OFFDISK	A01, J11, W00
12-88	OCTALFPP	D01, G02
12-89	BUTFLTR	A01, G02, W00
12-90	REPRSNT	A01, G02, W00
12-91	OCTPUNCH	A01, G02, W00
12-92	PDP8TO12	D01, G02
12-93	TRANS	D01, F02
12-94	DATAN	A01, W00
12-95	PDP-12 PS/8 Utility Programs	A01, J11, W00
12-96A&B	SCOPE and CNGMWA	A01, J11, W00
12-97	An Off-Line FOCAL-12 Program for Auto-Analyzers by TWX	D01
12-98	HERALD - Analog-Digital Average and Standard Error Program	A01, B07, J11
12-99	A Set of Spectral Programs	A01, J11, W00
12-101	OS/8 SKED	A01, J11, W00
12-102	A Manual for the PDP-12 Operator	A01, W00
12-103	$HAPPY	D01, G02

No.	TITLE	MEDIA/PRICE CODES
12-104	CORDATFP	A01, J11, W00
12-105	DATAFILE and DFUPDATE	A01, J11, W00 *
12-106	$PLOT	A01, J11, W00
12-107	AVUPT08, AVUPT08S	A01, J11, W00
12-108	FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler	A01, F02, G08, W00
12-109A, B&C	QNANSWER, QANDATTY, SUPRSHUF	D01, J11
12-110	DIAL-MS for 1600 Blocks	A01, J11, W00 **
12-111a	ADFILE	A01, J11, W00
12-112	IDXRDD	D01, J11
12-113	IDXWT	D01, J11
12-114	FOCAL-PL	A01, J11, W00
12-115	PLOT 3D, Pseudo 3-Dimensional Perspective Display for the PDP-12	A01, J11, W00
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals	A01, B07, J11
12-117	TAPEDIT; A PDP-12 LINCTAPE EDITOR	D01, J11
12-118	Average Transient Advanced Programs	A01, J11, W00] *same LINCtape
12-119	Neurone Spike Train Analysis Programs	A01, J11, W00]
12-120a	DUAL	A01, B12, J11 **
12-121	Arrhythmia Detection and Categorization	A01, B07, J11
12-122	PDP-12 User's Monitor Command	D01, J11
12-123a	OS/8 VR12 Handler	D01, F02, G02
12-124	FR, FIDS and FADC for PDP-12 Input/Output	D01, G02
12-125	Waveform Analysis	D01, J11
12-126	WAVEFORM: Evoked Potential Analysis	A01, B07, J11
12-128	GEP: A Generalized Experimental Package	A01, G06, W00
12-129	OS/12S Scope Monitor Operating System	A01, J11, W00
12-130	COMPARE - Fast LINCtape Compare	D01, J11
12-131	OS/8 DIBILD - Revised	A01, J11, W00
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8, OS/12)	A01, J11, W00

* same LINCtape; includes 12-105, 12-118, 12-119.

** LINCtape contains 12-46, 47, 110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES	
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine	A01, J11, W00	┐
12-134	RWDF32	A01, J11, W00	│
12-135	MAC8, 8K MACRO ASSEMBLER	A01, J11, W00	same LINCtape
12-136	MOVE	A01, J11, W00	│
12-137	PAL12D	A01, J11, W00	│
12-138	ISEL	A01, J11, W00	┘
12-140	NAEP - Nerve Action and Evoked Potentials	A01, J11, W00	
12-141	$CORREL - Intercorrelation Program for 50 Variables	D01, G02, J11	
12-142	FOCALSD	D01	
12-143	DSLIS - Dead Start Loader and Index Statistics	A01, J11, W00	
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)	A01, J11, W00	
12-145a	CREFNMAP	A01, B07, J11	*
12-146	$CORR (FOCAL Version)	D01, G02	
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples	D01, G02	
12-148	STATIS12, A Statistical Package for the PDP-12	A01, B07, J11	
12-149	XPIP8: PDP-12 DECtape PIP	A01, F06, W00	
12-150	XPIP10: PDP-10 DECtape to LINCtape Converter	A01, F02, W00	Source avail. from Author
12-151	"PSYCHO", A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics	A01, B12, J11	
12-152	LOAD31K, A Loader for DIAL-MS and 32K of Core	D01, J11	┐
12-153a	DUAL32, DUAL-28K Assembler	A01, J11, W00	│
12-154a	CREF32	J11, W00, Y00	*
12-155	MARK12X0	J11, W00, Y00	┘
12-156	MUSIC12	D01, J11	
12-157	PLOTVS, Device Independent Graphics	D01, J11	
12-158	FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's	D01, J11	
12-159	PLAYBOY	D01, J11	
12-160	CCTGEN - Carriage Control Tape Generator	D01, J11	
12-161	BIGCHARS	D01, J11	

* same LINCtape; contains 12-46, 47, 110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES
12-162	COREDIT	D01, J11
12-163	AD74 - High Speed Analog to Digital Conversion Program	D01, J11
12-164	DIAL.EXT	A01, B13, J11
12-165	NAP SYS: Program to Analyze Neuronal Spike Data	A01, B13, J15
12-166	OS/8-VC12 Display Device Handler for the PDP-12	D01, G02
12-167	FOCAL Patches	D01
12-168	Spectral Analysis System	A01, J11, W00
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12	A01, J11, W00
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12	A01, J11, W00
12-171	Three Patches to the Clinical Lab-12 System	D01, J11, Z00
12-172	WVU Utility Package	A01, J11, W00
12-173	SCOPEFOCAL	D01, J11
12-174	CLOCK: Digital Clock with Westminster Chimes	A01, J11, W00
12-175	PLOTZER	D01, J11
12-176	FOCAL-12 Overlay to Access the DF32 Disk	D01, G02
12-177	TENNIS	D01, G02
12-178	NUFOCAL, Modified FOCAL-12	D01, G02
12-179	The Mann-Whitney U Test	D01, G02
12-180	CARDDIAL - Input to the DIAL Editor Via Cards	J11, W00, Z00
12-181	ATSXL - Text Display and Timing Routine for FOCAL-RT	D01, J11
12-182	KLK - A Simple Clock Overlay for PDP-12 FOCAL	D01, J11
12-183	DECIO - FOCAL-12 Whole Word Digital I/O Overlay	D01, J11
12-184	PPSH - Neuronal Autocorrelation and Cross-correlation Analysis Programs	A01, J11, W00
12-185	Horoscope Casting Routines - Astrodynamical Subroutines	D01, J11
12-186	COBRA Assembler for the PDP-12	A01, J11, W00
12-187	OS/8 Device Handlers for PDP-12 Core	A01, J11, W00, Z00
12-188	4K DISK/LINCTAPE MONITOR	A01, J11, W00, Z00
12-189	DECtape Reader Handler for PDP-12	D01, G02
12-190	PDP-12 Functions for OS/8 BASIC	A01, B07, J11, X00
12-191	MTXIO - Multitasking Executive	A01, B12, J11
12-192	ASFLO - Packed ASCII to Floating Point Format Conversion	A01, J11, W00

same LINCtape

same LINCtape

same LINCtape

No.	TITLE	MEDIA/PRICE CODES	
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12	D01, G02	
12-194	Split Plot Factorial Analysis of Variance - % SPFAV	D01, G02	
12-195	TRIGSYS - A Multichannel, Fast Point Process Data Acquisition	A01, J11, W00, Z00	
12-196	TRALIB - Point Process Data Library and Editor	J11, W00, Z00	same LINC-tape
12-197	SUPRQA - Super QANDA	J11, W00, Z00	
12-198	BURST, V2 - A Point Process High-Pass Filter	A01, J11, W00, Z00	
12-199	CPRINT.SB: Utility Subroutines for a Centronics 101A Printer	D01, G02	
12-200	MULT-PS2: Multiple Printing Source Program	A01, J11, W00	
12-201	DPSPV3: Double Precision to Single Precision Integer Converter	A01, B07, F02, G06, J11	
12-202	PLOT8CH: 3-Dimensional Plotting of EEG Data	A01, B07, J11	

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-1	$ NC	$	$	$	$	$	$ 8.	$ 18.	$	$	1 LTA
12-2	1.*						8.	18.			1 LTA *NC with Tape
12-4	NC						8.	18.			1 LTA
12-5	NC			NC			8.	18.			1 LTA
12-6	NC			10.			8.	18.			1 LTA
12-7	NC						8.	18.			Same LTA (1)
12-8	NC						8.	18.			
12-9	NC			10.			8.	18.			1 LTA
12-10	NC			NC			8.	18.			1 LTA
12-11	NC			NC			8.	18.			1 LTA; also contains 12-15
12-12	NC						8.	18.			1 LTA
12-13	NC			NC			8.	18.			1 LTA (obj)
12-14	NC			NC			8.	18.			1 LTA
12-15	NC			NC			8.	18.			1 LTA; also contains 12-11
12-16	NC	2.	2.	NC							
12-17	NC			NC			8.	18.			
12-18	NC	2.	2.	NC							
12-20	NC	2.	2.								
12-21	NC	2.									
12-22	NC			10.			8.	18.			Same LTA (1)
12-23	NC			10.			8.	18.			
12-24	NC			NC			8.	18.			1 LTA
12-25	NC						8.	18.			1 LTA
12-29			8.								
12-30	NC			10.			8.	18.			1 LTA (bin, LAP6)
12-31	NC			20.			8.	18.			1 LTA (bin, LAP6)
12-32	NC			10.			8.	18.			1 LTA (bin, DIAL)
12-33	NC			5.			8.	18.			1 LTA (bin, LAP6, DIAL)
12-34	1.$						32.	72			4 LTA *NC with tapes
12-35	NC						8.	18.			1 LTA
12-36	NC						8.	18.			Same LTA (1)
12-37	NC						8.	18.			
12-38A	NC			NC			8.	18.			Same LTA (1)
12-38B	NC			NC			8.	18.			
12-39	NC						8.	18.			1 LTA
12-40	NC						8.	18.			1 LTA
12-41	NC	2.	8.								

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-42	$ NC	$	$	$ 5.	$	$	$ 8.	$ 18.	$	$	1 LTA (obj)
12-43	NC						8.	18.			Same LTA (1) (obj,src)
12-44	NC						8.	18.			
12-45	NC						8.	18.			1 LTA (obj,src)
12-46	NC						8.	18.			Same LTA (1) ; also contains
12-47	NC						8.	18.			12-110,120a,145,152,153,154,155
12-48	NC			10.			8.	18.			1 LTA
12-49	NC			NC			8.	18.			1 LTA
12-50							8.	18.			1 LTA
12-51	NC			10.			8.	18.			1 LTA
12-52	NC		2.								
12-53	NC		2.								
12-54	NC			10.			8.	18.			1 LTA
12-55	NC	2.	2.	NC							
12-56	NC			5.			8.	18.			Same LTA (1)
12-57	NC			5.			8.	18.			
12-58	NC			NC							
12-59	NC			NC			8.	18.			1 LTA
12-60	NC			NC			8.	18.			1 LTA
12-61	NC			NC							
12-62	1.*						8.	18.			1 LTA *NC with tape
12-63	NC						8.	18.			1 LTA
12-64	NC		2.	NC							
12-65	NC						8.	18.			1 LTA
12-66	NC						8.	18.			1 LTA
12-67	NC			NC			8.	18.			1 LTA
12-68	NC			10.			8.	18.			1 LTA
12-69	NC			NC			8.	18.			1 LTA
12-70	NC				8.	20.	8.	18.			1 LTA; 1 DTA for PDP-8 users
12-71	NC	2.									
12-72	NC			NC			8.	18.			1 LTA
12-73	NC			5.			8.	18.			1 LTA
12-74	NC			NC							
12-75	NC	2.	2.	NC							
12-76	NC						8.	18.			1 LTA
12-77	NC			10.			8.	18.			1 LTA
12-78	NC			10.			8.	18.			1 LTA

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-79	$ NC	$ 2.	$ 2.	$ NC	$	$	$	$	$	$	
12-80	1.*						8.	18.			1 LTA *NC with tape
12-81	NC						8.	18.			Same LTA (1) (obj,src)
12-82	NC						8.	18.			
12-83	NC		2.	NC							
12-84	NC						8.	18.			1 LTA
12-85	NC		2.	NC							
12-86	NC	2.	2.	NC							
12-87	NC						8.	18.			1 LTA
12-88	NC		2.	NC							
12-89	NC		2.								
12-90	NC		2.								
12-91	NC		2.								
12-92	NC		2.	NC							
12-93	NC	2.		NC							
12-94	NC										
12-95	NC						8.	18.			1 LTA
12-96A&B	NC						8.	18.			1 LTA
12-97	NC			NC							
12-98	NC			10.			8.	18.			1 LTA (obj,src)
12-99	NC						8.	18.			1 LTA (obj,src)
12-101	NC						8.	18.			1 LTA (obj,src)
12-102	NC										
12-103	NC		2.	NC							
12-104	NC						8.	18.			1 LTA (obj,src)
12-105	NC						8.	18.			1 LTA (Sys src) contains 12-118,119
12-106	NC						8.	18.			1 LTA (obj,src)
12-107	NC						8.	18.			1 LTA (obj,src)
12-108	NC	2.	12.								
12-109A,B,C	NC			NC			8.	18.			1 LTA
12-110	NC						8.	18.			1 LTA (obj) contains 12-46,47,
											120a,145,152,153,154,155
12-111a	NC						8.	18.			Same LTA (1) (obj,src)
12-112	NC			NC			8.	18.			
12-113	NC			NC			8.	18.			
12-114	NC						8.	18.			1 LTA (obj,src)
12-115	NC						8.	18.			1 LTA (obj,src)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-116	$ NC	$	$	$ 10.	$	$	$ 8.	$ 18.	$	$	1 LTA (obj,src)
12-117	NC			NC			8.	18.			1 LTA (obj,src)
12-118	NC						8.	18.			Same LTA (1) (obj,src); also
12-119	NC										contains files for 12-105
12-120a	NC			20.			8.	18.			1 LTA(obj,src); also contains 12-46,
											12-47,110,145,152,153,154,155
12-121	NC			10.			8.	18.			1 LTA (obj,src)
12-122	NC			NC			8.	18.			1 LTA
12-123a	NC	2.	2.	NC							
12-124	NC		2.	NC							
12-125	NC			NC			8.	18.			1 LTA (obj,src)
12-126	NC			10.			8.	18.			1 LTA (obj,src)
12-128	NC		8.								
12-129	NC						8.	18.			1 LTA (obj,src)
12-130	NC			NC			8.	18.			1 LTA (src)
12-131	NC						8.	18.			1 LTA (obj,src) (See 8-599)
12-132	NC						8.	18.			1 LTA (obj,src) (See 8-628)
12-133	NC						8.	18.			Same LTA (1); (obj,src)
12-134	NC						8.	18.			See also 8-631 thru 8-635
12-135	NC						8.	18.			
12-136	NC						8.	18.			
12-137	NC						8.	18.			
12-138	NC						8.	18.			
12-139	NC						8.	18.			1 LTA (obj,src)
12-140	NC						8.	18.			1 LTA (obj,src)
12-141	NC		2.	NC			8.	18.			1 LTA (obj) ; Order ASCII or LTA
12-142	NC			NC							
12-143	NC						8.	18.			1 LTA (obj,src)
12-144	NC						8.	18.			1 LTA (obj,src)
12-145a	NC			10.			8.	18.			1 LTA ;also contains 12-46,47,
											110,120a,152,153,154,155
12-146	NC		2.	NC							
12-147	NC		2.	NC							
12-148	NC			10.			8.	18.			1 LTA (obj)
12-149	NC	8.									
12-150	NC	2.									Src available from author
12-151	NC			20.			8.	18.			1 LTA (obj,src)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

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DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-152	$ 1.	$	$	$ Inc.	$	$	$ 8.	$ 18.	$	$	Same LTA (1) (obj,src); contains
12-153a	1.						8.	18.			12-46,47,110,120a,145 also
12-154a							8.	18.			
12-155							8.	18.			
12-156	1.			Inc.			8.	18.			1 LTA (obj,src)
12-157	1.			Inc.	8.	20.	8.	18.			1 LTA OS/12; 1 DTA OS/8
12-158	1.			Inc.			8.	18.			1 LTA (obj,src)
12-159	1.			Inc.			8.	18.			1 LTA (obj,src)
12-160	1.			Inc.			8.	18.			1 LTA (obj,src)
12-161	1.			Inc.			8.	18.			1 LTA (obj,src)
12-162	1.			Inc.			8.	18.			1 LTA (obj,src)
12-163	1.			Inc.			8.	18.			1 LTA (obj,src)
12-164	1.			25.			8.	18.			1 LTA (obj,src)
12-165	1.			25.			16.	36.			2 LTA (obj,src)
12-166	1.		2.	Inc.							
12-167	1.			Inc.							
12-168	1.						8.	18.			1 LTA (obj,src)
12-169	1.						8.	18.			Same LTA (1) (obj,src)
12-170	1.						8.	18.			
12-171	1.			Inc.			8.	18.			1 LTA (src,doc)
12-172	1.						8.	18.			1 LTA (obj,src)
12-173	1.			Inc.			8.	18.			1 LTA (obj,src)
12-174	1.						8.	18.			1 LTA (obj,src)
12-175	1.			Inc.			8.	18.			1 LTA (src)
12-176	1.		2.	Inc.							
12-177	1.		2.	Inc.							
12-178	1.		2.	Inc.							
12-179	1.		2.	Inc.							
12-180	On tape						8.	18.			1 LTA (src,bin,write-up)
12-181	1.			Inc.			8.	18.			
12-182	1.			Inc.			8.	18.			Same LTA (1) (obj,src)
12-183	1.			Inc.			8.	18.			
12-184	1.						8.	18.			1 LTA (src)
12-185	1.			Inc.			8.	18.			Same LTA (1) (obj,src)
12-186	1.						8.	18.			
12-187	1.						8.	18.			1 LTA (src,doc,routines)
12-188	1.						8.	18.			1 LTA (obj,src,doc)

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information 12 A - 5 (Vol. II)

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DECUS SERVICE CHARGES

NOTE: WRITE- UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-189	$ 1.	$	$2.	$ Inc.	$	$	$	$	$	$	
12-190	1.			10.			8.	18.			1 LTA (bin,src,listing,functions)
12-191	1.			20.			8.	18.			1 LTA (obj,src)
12-192	1.						8.	18.			1 LTA (obj,src)
12-193	1.		2.	Inc.							
12-194	1.		2.	Inc.							
12-195	1.						8.	18.			Same LTA (1) (obj,src,doc)
12-196	On tape						8.	18.			
12-197							8.	18.			
12-198	1.						8.	18.			
12-199	1.		2.	Inc.							
12-200	1.						8.	20.			
12-201	1.	2.	8.	10.			8.	20.			
12-202	1.			10.			8.	20.			

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

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There are four Library LINCtapes of PDP-12 programs. Contents of tapes and applicable Service Charges are:

TAPE	DECUS NO's	USER TAPE	DECUS TAPE
1	12-1, 2, 4	$15.00	$25.00
2	12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	35.00	45.00
3	12-22, 23, 25, 30, 31, 32, 33 35, 36, 37, 41, 42, 43, 44	35.00	45.00
4	12-45, 46, 47, 51, 54, 55, 56, 57	25.00	35.00

Library Tapes previously ordered will not be automatically updated.

GENERAL INFORMATION

All DECUS service charges are to help defray the cost of reproduction, handling and postage. All orders must be accompanied by cash, DECUS Coupons or Purchase Order. Please make checks payable to DECUS.

Because of the difficulties encountered by many installations in obtaining Purchase Orders for small amounts, DECUS Coupons may be ordered for any amount and used as subsequent payment for DECUS services. Coupons are available in $1.00 and $5.00 denominations. They may be ordered as DECUS NO. 0051.

Payment for DECUS Coupons must be made in advance. Purchase Orders for coupons must be paid before coupons can be issued.

All charges are in U. S. dollars, and are subject to change without notice.

European Users - Payment may be made, in your currency, to: Martha Ries, Digital Equipment Co., Int'l-Europe, 81 Route de L'Aire, 1227 Carouge/Geneva, Switzerland. Please refer to currency exchange charts available from that office.

Service charge for DECUS Proceedings is:

Attendees - First copy free, additional copies $5.00 each
Non-attendees - $5.00 per copy

Charges for DECUS three-ring binders are:

One inch (1") Black Program Library Catalog Binder - $2.50
Two inch (2") Blue general DECUS binder - $3.50

When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

Currently there are four (4) library LINCtapes of PDP-12 programs available from DECUS. Service charges for these tapes are:

Tape #1	DECUS NO's. 12-1, 2, 4	$10.00 on user supplied LINCtape $20.00 on DECUS supplied LINCtape
Tape #2	DECUS NO's. 12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	$30.00 on user supplied LINCtape $40.00 on DECUS supplied LINCtape
Tape #3	DECUS NO's. 12-22, 23, 25, 30, 31, 32, 33, 35, 36, 37, 41, 42, 43, 44	$30.00 on user supplied LINCtape $40.00 on DECUS supplied LINCtape
Tape #4	DECUS NO's. 12-45, 46, 47, 51, 54, 55, 56, 57	$20.00 on user supplied LINCtape $30.00 on DECUS supplied LINCtape

Available write-ups are supplied, at no charge, for each library tape issued.

A complete library of all current DECUS PDP-12 write-ups is available at a service charge of $15.00

DECUS NO. 12-1

EEG Data Collection (BNI Series)

Dr. Grey Walter
Submitted by: Marty Kaye, Digital Equipment Corporation, Maynard, Massachusetts

These programs acquire and manipulate analog data for neurological applications. Data storage and hard copy (plotter) facilities are part of the package.

Minimum Hardware: 4K PDP-12A and KW12 for some programs, and XY 12 plotter
Source Language: LAP6-DIAL

DECUS NO. 12-2

PDP-12 Utility and Data Reduction Programs

Donald Overton, Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

This tape contains a variety of programs written for the classic LINC or LINC-8 which have been modified to run in the PDP-12. Included are data reduction programs which perform autocorrelation, fourier analysis, power spectral analysis and convolution. Utility programs allow selected blocks of LINCtape to be searched, compared or typed out. Also included are programs which allow the user to convert LAP4 or LAP6 manuscripts into LAP6-DIAL, or to disassemble binary code into LAP6 or LAP6-DIAL source. None of these programs were written by the current author, who has simply modified them for operation under LAP6-DIAL in the PDP-12.

Source Language: LAP6-DIAL

DECUS NO. 12-3

Obsolete

DECUS NO. 12-4

IRDA

David Ferrarini, Digital Equipment Corporation, Maynard, Massachusetts

The IRDA (infra-red data acquisition) program acquires asynchronous data from an interfaced instrument, displays the data on the scope, and stores it on LINCtape. IRDA is compatible with any device that transmits X-Y data at a rate as fast as 103 milliseconds/point and accepts up to a maximum of 1000_{10} data points. The external asynchronous device is interfaced to the PDP-12 computer by two potentiometers, one transmits X axis input (independent variable), the other transmits Y axis input (dependent variable). For every one bit increment in the X axis, IRDA retrieves one value from the Y pot and stores it in the data area. For example, IRDA can generate an absorption spectrum from an infra-red spectrophotometer.

Minimum Hardware: PDP-12A with KW12A clock
Other Programs Needed: LAP6-DIAL
Source Language: FORTRAN

DECUS NO. 12-5

SERCHPRO

Jean Champarnaud, Digital Equipment Corporation, Maynard, Massachusetts

Basically, this program does two things: 1. Tells the user the starting block number and the number of blocks of any binary file saved on a DIAL tape. 2. Indicates the starting mode (LINC or 8), starting address and actual memory locations into which the program will be loaded.

Source Language: LAP6-DIAL

DECUS NO. 12-6

ANDIP - Analog Digital Interchange Program

C. J. Thompson, D. Skuce, Montreal Neurological Institute, Montreal, Canada

ANDIP will transfer analog data between the analog to digital converter, the LINCtape or the PEC IBM compatible tape and the PDP-12 display, incremental plotter or the Tektronix graphics terminal. Up to 16 channel data may be transferred. Three of the analog knobs are used to control the presentation of the data on the display and graphic output devices. The data can be edited from LINCtape. A display of the input data is available during analog to digital conversion.

Storage Requirement: 0-1777, 4000-5400
Source Language: LAP6-DIAL

DECUS NO. 12-7

DBLFLT - Double Float Mathematical Routines

Donald A. Overton, Ph.D., Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

The DBLFLT routines are LINC mode programs which perform mathematical operations using a double precision mantissa and a 12-bit exponent to obtain an effective accuracy of about 7 decimal digits. The program DBLFLT by Michael McDonald and an altered version called DBLFLT1 each require two quarters of memory and provide the basic mathematical operations (add, subtract, multiply, divide, fix, float). A larger routine called DBLFLT3 is derived from DECUS NO. L-68. It occupies seven quarters of memory located outside the current instruction field and provides a variety of commonly used

DECUS NO. 12-7 (Continued)

mathematical functions (square root, sine, cosine, log, arctangent, etc.) as well as routines for teletype input and output.

Source Language: LAP6-DIAL

DECUS NO. 12-8

Teletype Conversion Routines

Donald A. Overton, Ph.D., Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

These routines provide various types of conversion from ASCII teletype code to binary, and vice versa. By using the appropriate routine, 1-8 octal or decimal digits may be converted from ASCII to single or double precision binary, and conversely. Some routines can search and decode QANDA answer fields. Most routines are by D. J. Nichols and have previously been circulated for use with LINC keyboard codes (DECUS NO. L-46 to L-50).

Source Language: LAP6-DIAL

DECUS NO. 12-9

SLOWCREF

John Burness, Digital Equipment Corporation, Maynard, Massachusetts

Revised tape by: Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York 4/6/73

SLOWCREF is a modified version of the PDP-12 cross-reference program, CREF 12 (DEC-12-FRZA-D), and is used for the special case when a cross-reference of a long system program (e.g. PIP) is needed. CREF 12 is designed to be run on an 8K machine, thereby limiting the size of a program which it can successfully cross-reference. SLOWCREF runs on a 16K machine, thus doubling the size of the program which can be cross-referenced. Because the symbol table crosses field boundaries when doing searches and inserts, SLOWCREF runs from 4 to 8 times slower than CREF 12 on the same program. Therefore, if the user's source is less than about 2ØØ blocks, try to use CREF 12 to cross-reference the program first, rather than SLOWCREF.

Restrictions: Must operate under DIAL-MS
Source Language: LAP6-DIAL

DECUS NO. 12-10

FOCAL Library (LINCtape FOCAL for the PDP-12)

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

This is a 4K FOCAL library system to call FOCAL programs from LINCtape. Up to $62_{(10)}$ programs may be stored on one tape. An index routine may be called which displays the index of the library. Through this program the index may be updated and new programs added to the system.

Source Language: LAP6-DIAL

DECUS NO. 12-11

ODTAPE (Octal Debugging for the PDP-12 LINCtape)

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

This is a utility routine for scanning blocks of LINCtape. The operator may choose to list the block in total, line by line, or word by word. He may also scan the block for a certain word or change the contents of a word or group of words. It is an aid in debugging tapes, bypassing the error-prone switch method.

Storage Requirement: Page Ø, Page 1, 1000-1546, 4400-4777
Restrictions: Operates on units Ø and 1 only
Miscellaneous: Starts at Ø2ØØ in PDP-8 mode
Source Language: LAP6-DIAL

DECUS NO. 12-12

8TO12 File Converter

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

8TO12 allows the user to read PDP-8 DECtape source files created by the 4K PDP-8 Disk Monitor System (versions 8G, AE, AF) and output them directly to a PDP-12 DIAL tape, utilizing the TC12-F hardware option. Both input and output files may be specified by names and all the necessary corrections in text packing are performed.

Restrictions: Will only operate on a PDP-12 with TC12-F hardware option
Source Language: DIAL

DECUS NO. 12-13

RDPEC: PEC Synchronous Tape Read Program

Joyce L. Kerr, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania

RDPEC will read and interpret a 9-channel digital tape from a PEC synchronous tape transport. Although it is designed primarily for reading EBCDIC or binary records on IBM 360-compatible tapes, the program can also be used to determine record lengths, locate tape (EOF) marks, and check for tape errors on any odd parity, high density tape.

Minimum Hardware: PDP-12A; PEC 9-channel synchronous tape transport with TR04A tape controller
Source Language: LAP6-DIAL

DECUS NO. 12-14

MUL-2REG

Richard W. Baker, Iowa State University, Ames, Iowa

MUL-2REG provides the user with an integer multiply subroutine capable of multiplying the contents of 2 registers (each register may contain values up to ± 3777) resulting in a signed double register product. With the hardware integer multiply the product must not exceed the capacity of a single register. If overflow does occur the most significant high order bits are lost and the user will be unaware of this fact since the overflow indicator is not triggered by 'MUL.' MUL-2REG bypasses the above stringent restrictions and pitfalls of the hardware integer multiply.

Storage Requirement: 75 Octal Registers (61 Decimal)
Source Language: LAP6

DECUS NO. 12-15

HISTO12

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

HISTO12 is an interspike interval plotting routine. The program uses an adjustable threshold to discriminate against baseline noise and will eliminate spikes shorter than 500 μ's or longer than 2.1 ms. A limit to the number of spikes counted may be selected. Printed output consists of sampling diagnostics, total spikes counted, the average input frequency, total time in sampling, and number of spikes not appearing in the display. The display in either scattergram or histogram mode may be expanded horizontally defining intervals of 0.0 to 0.2 to 0.0 to 1.6 seconds. Vertical scaling is accomplished by addition, subtraction or by multiplication, division. Complete operating instructions type out upon program startup.

Source Language: LAP6-DIAL

DECUS NO. 12-16

MODCLK

Stephen J. Mayor, Medical College of Ohio at Toledo, Toledo, Ohio

This program is used as a test of the KW-12 clock which uses the sense switches and Teletype. Each sense switch corresponds to a particular clock frequency and depressing a switch causes the Teletype bell to ring at a certain rate as follows: SNSØ, 1ØØHz, 1/SEC . SNS1, 1KHZ, 1/2SEC; SNS2, 10KHZ, 1/4 SEC; SNS3, 100 KHZ, 1/6 SEC; SNS4, 400 KHZ, 1/8 SEC.

Minimum Hardware: 4K PDP-12A and KW-12 clock
Storage Requirement: 242 Octal locations
Source Language: LAP6-DIAL

DECUS NO. 12-17

DIALRFØ8

Gary B. Jennings, Digital Equipment Corporation, Maynard, Massachusetts

RFØ8 DISKØ is loaded from LINCtape units Ø and 1. Tape motion is not interrupted by disk transfers, as tape is read and the disk is written simultaneously. Maximum rate of transfer is obtained and only two blocks of tape are used for program and error subroutine storage.

Source Language: LAP6

DECUS NO. 12-18

"FAILSAFE"

Gary B. Jennings, Digital Equipment Corporation, Northbrook, Illinois

This program is a failsafe method of copying one LINCtape onto another. It is almost essential in critical applications such as "CLINILAB" to insure that tapes have been duplicated exactly with zero chance of error.

Minimum Hardware: 8K
Source Language: LAP6

DECUS NO. 12-19

DIBOL-12 (PDP-12 Addendum for DIBOL II System User's Guide (DECUS NO. 8-337))

Program is exactly as described in write-up for DECUS NO. 8-337 with the addition of an instruction sheet for PDP-12 usage and a system LINCtape.

Source Language: PAL-10

DECUS NO. 12-20

FORMATXT

G. C. Ongley, Medical Research Council, Greylingwell Hospital, Chichester, Sussex, England

Used instead of PIP, FORMATXT loads and tabulates a source paper tape which has been punched off-line and so does not have formatted text as given by DIAL's EDITOR. DIAL-acceptable start and end codes are added, and the program exits to DIAL EDITOR.

Source Language: LAP6-DIAL

DECUS NO. 12-21

Modified MAGSPY

Lawrence Moss, University of Vermont, College of Medicine, Burlington, Vermont

MAGSPY is in the DEMO monitor. Addition of an octal

DECUS NO. 12-21 (Continued)

display of data, CR to restart DIAL, startup with the request for block number and unit, and display movement controlled by knob 4 make this modification different.

Minimum Hardware: PDP-12A, (LINCtapes, A/D scope)
Source Language: DIAL - patched

DECUS NO. 12-22

PLOTFFT

J. R. Mason, U.C.L.A. Brain Research Institute, Los Angeles, California

PLOTFFT reads the LINCtape created by the CFFT program (DECUS NO. 12-23) and plots a graph of the auto spectra on a digital plotter.

Minimum Hardware: PDP-12 with 8K memory, LINCtapes, Digital Plotter (0.01 in/step)
Source Language: LAP6

DECUS NO. 12-23

CFFT

J. R. Mason, U.C.L.A. Brain Research Institute, Los Angeles, California

This is a modification of the LINC Spectrum Program (DECUS NO. L-25) for use on the PDP-12. It eliminates the use of LINCtape for intermediate storage, calculations and overlays, but keeps the basic memory block structure of the previous program. All of the program resides in core. As before, the epoch is fixed at 1792 samples. However, the program samples continuously, calculates the spectra of the 17.5 second (1792 samples) epochs and writes the CALCULATED SPECTRA values on LINCtape unit 1 in double precision format.

Minimum Hardware: PDP-12 with 8K memory, LINCtapes, KW-12 clock
Source Language: LAP6

DECUS NO. 12-24

Overlays to FOCAL-12

Submitted by: Marty Kaye, Digital Equipment Corporation, Maynard, Massachusetts

This is a series of overlays for FOCAL-12, by various authors, combined on one LINCtape and distributed as one document. Present routines include: FOCAL-12K; $TEXT; $SNS; $RELAY, $LPØ8; $DEVICE; $PLOT, $ECHO & $ECHOFN; $CHARSIZ, $DTOA.

Source Language: LAP6-DIAL

DECUS NO. 12-25

Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C

R. E. Kingsley, Indiana University, Bloomington, Indiana

FRACUS extracts decimal integer or fraction input from QANDA answer field and places floating point equivalent in user defined output field.

SCRMBL extracts octal or decimal integer input from QANDA answer fields and places the octal equivalent in user defined output field.

QANDA-C allows the decoding of the "CONTROL" character by QANDA.

Source Language: DIAL-MS

DECUS NO. 12-26

DATAFILE

Dr. C. M. Malpus, University of Leeds, Leeds, England

DATAFILE is a LINCtape based interactive library designed primarily as a transparent system by which data from a user program can easily be stored, edited and retrieved. The only addition needed to any user program is a short loader routine, and when the user program is restored to core, the contents of only one register (location 17) are changed from what they were before the loader was entered.

Binary programs can also be stored and DATAFILE can act as a free-standing library system, started (like LAP6) from console procedure and capable of loading and starting binary programs on file within it.

DATAFILE thus takes over the binary library and loading facilities of LAP6, and can additionally be called from (and exit to) user programs to file resultant data. Because of its compactness compared with LAP6, and its increased file and index space, it is much more efficient, as well as easier to use, than LAP6 for debugged, operational programs and routines.

The 4K LINC-8 version of DATAFILE (issue dated 7/7/70) can operate from tape units 0, 1, 4 and 5 and can file and retrieve data from any unit. Data can be filed and retrieved, or programs loaded into memory banks 1, 2 and 3. A version of DATAFILE for the PDP-12 is under development which will have no core size limitations.

Source Language: LAP6

DECUS NO. 12-27

LOADBIN

Dr. C. M. Malpus, University of Leeds, Leeds, England

LOADBIN is a utility program for use with the DATAFILE library system and is the means by which binary programs (as opposed to binary data) can be handled by DATAFILE. Binary programs written on LINCtape are filed on a DATAFILE tape by LOADBIN, which makes all necessary transfers, index-

DECUS NO. 12-27 (Continued)

updating and file sorting. Once programs are filed by LOADBIN, DATAFILE will retrieve and load them into absolute locations and start at any address.

Sourge Language: LAP6

DECUS NO. 12-28

DXCREATE

Dr. C. M. Malpus, University of Leeds, Leeds, England

DXCREATE is a utility program for use with the DATAFILE library system. It is used for repairing damaged DATAFILE library indexes, and for the creation of indexes with arbitrary or non-standard contents. All necessary manipulations of the index are carried out by DXCREATE, but the files whose details are contained within the index are unaffected.

Source Language: LAP6

NOTE FOR 12-26, 12-27, 12-28: The programs previously assigned these numbers were really LINC8 programs and were placed in this section of the catalog in error. See L-124A,B &C.

DECUS NO. 12-29

LINC-10

Juergen Klauske, Digital Equipment GmbH, Hannover, Germany

This is a set of FORTRAN callable functions and subroutines to operate the following PDP-12 options: A/D Converter, Display, Left Switches, Relays, LINCtape (Block oriented, unformatted I/O).

Source Language: SABR

(NOTE: No documentation available, tapes only. (See Price List)

DECUS NO. 12-30

TDUMP

S. G. Wellcome and D. F. Pavlock, Digital Equipment Corporation, Maynard, Massachusetts

This tape dump program allows the programmer to print out the contents of any block of his LINCtapes or disk. The output will be printed on any of the following three printers: Teletype, LPØ8 printer, LP12 printer. The program is a standard load and go LAP6-DIAL binary. All input information is via a standard QANDA frame. All I/O is buffered and the tape runs in NOPAUSE mode. The output printed is the octal contents of each block.

Other Programs Needed: DIAL-MS
Storage Requirement: 8K
Source Language: LAP6-DIAL

DECUS NO. 12-31

DCON-1Ø

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

DCON-1Ø allows the user to read and write PDP-10 DECtape source files on a PDP-12 equipped with the TC-12F hardware option. All necessary index handling is performed. Binary files produced by PAL1Ø or PAL12 may be transferred to the DIAL binary working area or punched on paper tape.

Minimum Hardware: 8K PDP-12 with two LINCtape drives and TC12 hardware option
Other Programs Needed: DIAL-MS
Source Language: LAP6-DIAL

DECUS NO. 12-32

COMPAR12

D. F. Pavlock and S. G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

COMPAR12 allows the user to compare either source or binary DIAL files by name, or specified blocks of tape or disk by absolute block numbers. Any discrepancies are displayed on the scope. With 8K, the comparison is done 1Ø blocks at a time. If 12K is available, it is done 2Ø blocks at a time.

Other Programs Needed: DIAL-MS I/O routines
Storage Requirement: 8K
Source Language: LAP6-DIAL

DECUS NO. 12-33

KWANDA

Gene Kwatny, Krusen Research Center, Temple University, Philadelphia, Pennsylvania

KWANDA provides several additions to QANDA (DEC-12-FISA) for text display and input/output. KWANDA need reside in only one segment and may be accessed from any other. The Teletype I/O routines may be called from any segment. The number of digits in the answer field is extended to 99 and control-characters may be utilized.

Minimum Hardware: PDP-12A
Other Programs Needed: Refer to QANDA (DEC-12-FISA)
Storage Requirement: $1ØØØ_8$
Source Language: LAP6-DIAL

DECUS NO. 12-34

STAP-12

Urs R. Wyss, University of Zurich, Zurich, Switzerland

An open ended library system for neuronal spike train analysis is presented. It provides for: 1) Assimilation of event/time data (spikes), 2) Data management of digitalized spike trains, 3) Off-line analysis of spike trains (histograms, correlograms, etc.), 4) Output drivers (display, plotter).

Minimum Hardware:	8K PDP-12, KW12, EAE (KE12)
Restrictions:	Does not run under LAP6-DIAL or DIAL-MS
Source Language:	Mixed Mode PDP/LINC Assembler

DECUS NO 12-35

Bioelectric Signal Sorter (JULIA)

Vratislav J. Prochazka, University of Ulm, Ulm, West Germany

This program provides a means for the automatic sorting and time analysis of biological action potentials. Unit recognition is achieved by a template-matching technique with semi-automatic handling of interference potentials, ensuring a very reliable sorting.

Minimum Hardware:	PDP-12 with A/D, VR12 Display, Basic LINCtape System, 8K Memory, ASR33, KW12, KE12
Source Language:	LAP6

DECUS NO. 12-36

Hangman for PDP-12

Jud Gilbert, Florida State University, Tallahassee, Florida

This word game is based on the pencil and paper stick figure drawing game. One player types in a book title and a clue. Another player guesses letters. Six incorrect guesses loses.

Minimum Hardware:	PDP-12, LINCtape, Scope
Storage Requirement:	1024 words
Source Language:	DIAL

DECUS NO. 12-37

ODCAD (Octal to Decimal Conversion and Display)

Jud Gilbert, University of Florida, Tallahassee, Florida

The purpose of this program is to convert 11 bit signed (octal) numbers to decimal numbers and display them on the VR12 scope suppressing leading zeros, with or without decimal point.

Minimum Hardware:	PDP-12, Scope, LINCtape
Storage Requirement:	242_8 locations
Source Language:	DIAL

DECUS NO. 12-38A

Histogram and One-Factor Analysis of Variance

Mary Kathleen Fairbanks, Neuropsychology Research, Veterans Administration Hospital, Sepulveda, California

The program performs three primary functions which may be executed singly or in any desired combination, i.e. data storage, histogram construction and analysis of variance computation. Accepts integer data entered via teletype and stores these data on LINCtape using the DIAL index. Displays a histogram of the integers on request using the PDP-12 scope. Displays minimum, second smallest, second largest and maximum values of the data array. Computes either a one-factor repeated measures or a one-factor completely randomized analysis of variance on the data if requested. This program package is composed of the following program segments: $ANOVA, $HISTGM, $INT, $GPH, %AV, %2AV, %3AV. The package will handle a maximum of 6ØØ numbers at one time and the largest number of intervals that the histogram may have is 95.

Minimum Hardware:	PDP-12A, 8K, 2 TU/55
Other Programs Needed:	FOCAL-12
Source Language:	FOCAL-12

DECUS NO. 12-38B

Histogram and Two-Factor Analysis of Variance

Mary Kathleen Fairbanks, Neuropsychology Research, Veterans Administration Hospital, Sepulveda, California

As for DECUS NO. 12-38A

DECUS NO. 12-39

QUANAT 1

John Hogan, Weston Observatory, Boston College, Weston, Massachusetts

QUANAT 1 is a version of the Q and A subroutine that has the following features: 1) An independently located ('floating') text buffer, 2) Single character deletion and 3) LAP6 character codes, excluding 75, 76 and 77.

Storage Requirement:	254 Decimal locations
Source Language:	LAP6

DECUS NO. 12-40

PDP-8 Disk Monitor - LAP6-DIAL Interface

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This package contains three programs which facilitate operation of the PDP-8 Disk Monitor and LAP6-DIAL operating systems on a PDP-12 at the same time. Rapid bidirectional ASCII and binary file communication between the two operating systems is also provided for.

DECUS NO. 12-40 (Continued)

Minimum Hardware: PDP-12A, DF32 Disk, 8K, TTY, VC 12 Display
Source Language: DIAL

DECUS NO. 12-41

BLOOPD - Blood Pressure Display Program

Julia A. Voland
Submitted by: Dr. Nelson E. Leatherman, Indiana University, Bloomington, Indiana

BLOOPD is primarily for visual information only. It displays either the blood pressure waveform on a calibrated scope, or the digitized values of four parameters of the blood pressure. A printout of the values is also provided. All options are selected by teletype.

Minimum Hardware: PDP-12A
Storage Requirement: Two fields, total 2713_8 locations
Source Language: LAP6

DECUS NO. 12-42

CALCO 12

Richard Reeder, State University of New York, Stony Brook, New York

This plotter program can be used with programs like CATACAL to obtain reasonably high-speed hard copy of data which is stored on tape.

Minimum Hardware: PDP-12, Model 565 CalComp Plotter, VR12 Display, One LINCtape Unit, EAE
Storage Requirement: 1K of core
Source Language: DIAL

DECUS NO. 12-43

PLOT3D

J. Cohen and M. Carhart, Northwestern University Medical School, Chicago, Illinois

This program displays data from LINCtape and allows for user modification before plotting on an XY plotter. As each block is plotted, the previous data is not overwritten. This produces a three-dimensional effect. Data can be single or double precision. The space between each block is selectable. A subroutine to label each graph is included. Frequency power spectra data shows time shifts.

Minimum Hardware: 4K PDP-12, XY Plotter
Storage Requirement: 4K
Source Language: LAP6-DIAL

DECUS NO. 12-44

AVERDT

J. Cohen and M. Carhart, Northwestern University School of Medicine, Chicago, Illinois

This program is designed for averaging EEG analog data points with delayed trigger to indicate each epoch. In this way data both before and after the signal can be studied. The epoch length can vary from 1 to 7 seconds and 7 data channels are available. A number of trials are averaged and can be displayed and saved on LINCtape. One can select a variable stimulus probe. This program is excellent for measuring readiness potentials.

Minimum Hardware: 8K PDP-12, KW12
Source Language: LAP6-DIAL

DECUS NO. 12-45

FOCALP - FOCALPE

Judson Gilbert, Florida State University, Tallahassee, Florida

This is a new version of FOCAL 5/69 (DECUS NO. FOCAL8-52) which has been tailored to the 4K PDP-12A with an incremental plotter. The program exists as symbolic and binary programs on a DIAL V2 tape. In this way it can be readily modified/reassembled/and loaded. There are two versions -- FOCALPE with extended functions, FOCALP without. Many of the commands and features have been changed in this program.

Minimum Hardware: 4K PDP-12A, Incremental Plotter
Source Language: DIAL

DECUS NO. 12-46

STRINGS

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This program provides a character string search function to the DIAL-MS editor. Any character string up to 15 characters in length may be searched for in the work area of the DIAL-MS editor, using STRINGS.

Minimum Hardware: 8K PDP-12B
Other Programs Needed: DIAL-MS
Restrictions: Will not run under DIAL-V2
Source Language: DIAL

DECUS NO. 12-47

PIP-16ØØ

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This program is useful in conjunction with DIAL-MS tapes using DEC's new LINCtape format of $16ØØ_8$ blocks. It provides facilities for storing and retrieving source and binary

DECUS NO. 12-47 (Continued)

files on these tapes (existing software would not store above block 778_8). Also provided is an option to duplicate entire (1600_8 block) LINCtapes. PIP-16ØØ can reference the DIAL-MS work area for either source mode input or output. PIP-16ØØ effectively doubles the storage area on DIAL LINCtapes.

Minimum Hardware:	8K PDP-12B
Other Programs Needed:	DIAL-MS, MARK 12-1 (Included on LINCtape)
Restrictions:	Will not run under DIAL-V2
Source Language:	DIAL

DECUS NO. 12-48

PS/8 FORTRAN Library Routines

Charles M. Moore, III, Rice University, Houston, Texas

This package contains a set of additional PS/8 FORTRAN Library routines. The binary files containing these routines have been collected into library file LIB12.RL on the LINCtape. A modified version of LOADER.SV is provided which searches both LIB.12 and LIB8 when completing the building of a core image of a user's program. File WRITE.UP provides additional details. FORTRAN demonstration programs are included on tape.

Among the routines included on the LINCtape are:

1. PDP-12 PS/8 FORTRAN Display Routines
2. PS/8 FORTRAN Teletype I/O Routines
3. PS/8 FORTRAN File I/O Routines
4. PDP-12 PS/8 FORTRAN LINC mode I/O Routines
5. PDP-12 PS/8 FORTRAN LINCtape I/O Routines

Minimum Hardware:	PDP-12 with PS/8 (Some will run on PDP-8 with PS/8). Display routines require CRT and some require EAE. Two routines require KW12-A real-time clock
Miscellaneous:	Entire package is contained on a PDP-12 LINCtape marked using 128-word blocks
Source Language:	SABR

DECUS NO. 12-49

Cold Start DF32 Disk Formatter for PS/8 on a PDP-12

Mario DeNobili
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

The following problem arises for users who have a PDP-12 (with LINCtape) and a DF32 disk and who wish to use the PS/8 programming system:

They would like to use the disk as the system device since this expands the capabilities of PS/8 and speeds it up considerably; however, they cannot devote the disk to the exclusive use of PS/8 since other programs (notably the LAP6-DIAL-MS monitor system) require the use of the disk. Recreating the PS/8 disk system from scratch is normally very time consuming. This document explains a method for the user to create a PS/8 disk system from scratch as easily as he can bootstrap into a PS/8 LINCtape system.

Minimum Hardware:	8K PDP-12B, 32KDF32 Disk, LINCtape
Other Programs Needed:	PS/8-8K Programming System, PS/8 Configurator
Storage Requirement:	4ØØØ - 426Ø
Source Language:	Assembly Language

DECUS NO. 12-50

EDIT-12

Henry A. Maurer, Digital Equipment Corporation, Maynard, Massachusetts

EDIT-12 is a simple modification of PS/8's EDIT that causes all characters to appear on the scope instead of on the teletype, considerably speeding up editing.

Minimum Hardware:	Any PS/8 configuration on a PDP-12
Source Language:	PAL-8

DECUS NO. 12-51

MAGSPYD

Clark S. Donley, Johns Hopkins University, Baltimore, Maryland

MAGSPYD is a modification of MAGSPY that provides the ability to look at any length tape, and to view the unpacked ASCII generated by the DIAL-MS assembler with a LISTAPE instruction. It allows convenient use of the teletype to restart the program, rewind the tape, go to DIAL, or to display a HELP frame to explain the sense switch options. It includes an A/D knob to control the number of lines displayed on the screen and a sense switch option to stop the movement of the display. It also contains the octal display and large/small waveform options of earlier modifications.

Minimum Hardware:	4K PDP-12
Source Language:	LAP6-DIAL

DECUS NO. 12-52

Student Test Analysis

Stephen J. Mayor, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

This is a three-part program to score and do item analysis of student responses. Part I of the program scores parts of the exam. It prints out the student's number and his score on that part of the exam along with the percentage of the class making the correct answer. Part II takes the scores of all parts of the exam and prints out: (1) the student's number and his overall score, (2) the class mean and standard deviation, (3) the decile distribution in terms of percentage of class, (4) a plot of the decile distribution. Part III of the program computes

DECUS NO. 12-52 (Continued)

the distribution of answers, in terms of percentage of class, to a given question for each part of the exam. Printout is (1) question number, (2) choice number, (3) % of class making that choice, (4) answer key.

Minimum Hardware: 4K PDP-12
Source Language: FOCAL-4K

DECUS NO. 12-53

Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments

Stephen J. Mayor, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

This program takes the raw data outputted from the LSC's (Packard Model 3380) teletype punch, and using the Okitz equations, calculates the DPM for two isotopes of each sample. The AES ratio is used to calculate percentage of efficiency and spillover for each isotope.

Minimum Hardware: PDP-12A, Teletype punch and reader
Storage Requirement: 4096 words
Source Language: FOCAL-4K

DECUS NO. 12-54

QUIP - Quick Assembler for the PDP-12

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

QUIP is a modification of the DEC Floating Point Assembler to enable it to handle LMODE as well as PMODE instructions. All of the floating point handlers have been removed, and in their place have been substituted handlers for LINC code, ring buffer handlers and nopause routines. Because both the LMODE and PMODE symbol tables are core resident and because of the symbol table search algorithm used, operation is up to four times faster than the DIAL Assembler.

Minimum Hardware: 8K PDP-12
Other Programs Needed: DIAL-MS I/O Routines
Source Language: DIAL

DECUS NO. 12-55

FFAESIM

H. G. Helgeson, Forsvarets Forskningsanstalt, Stockholm, Sweden

This program makes it possible to run the FFTD program on a PDP-12 without the EAE option. It consists of a modified version of Digital-8-17-U, Extended Arithmetic Element Instruction Set Simulator, and a patch to change the EAE instructions in FFTD.

Minimum Hardware: 8K PDP-12B
Other Programs Needed: FFTD (DEC-12-FQEA)
Storage Requirement: 165-177; 200-357; 1600-1653
Source Language: LAP6-DIAL

DECUS NO. 12-56

QANDA+ - Modified QANDA Subroutine

W. R. J. Funnell, McGill University, Montreal, Canada

QANDA+ is a modified version of the QANDA subroutine (DEC-12-FISA). The following changes have been made: (1) it no longer needs to be in the same instruction field as the calling program, (2) both QANDA itself, and the GETKBD subroutine, return control to LAP6-DIAL when Cntrl/D is typed, (3) the routines for returning to LAP6-DIAL, and for typing a carriage return/line feed pair, are both accessible to external programs, and (4) the calling sequence has been changed.

Minimum Hardware: PDP-12B
Storage Requirement: First 4 pages of any segment
Restrictions: Same as for QANDA, also , TTY must be initialized before use
Source Language: LAP6-DIAL

DECUS NO. 12-57

SPY+ - Modified MAGSPY

W. R. J. Funnell, McGill University, Montreal, Canada

SPY+ is a modified version of MAGSPY (DEC-12-USZA). It incorporates the added features of DECUS NO. 12-21 (by Lawrence Moss), as well as the following features: (1) it can handle tapes marked with 1600_8 blocks, (2) upon reaching the end of the tape it will stop moving the window, rather than go to the other end of the tape, (3) it is controlled from the TTY rather than from the sense switches, and (4) the waveform display may be scaled by means of knob 0.

Minimum Hardware: PDP-12A
Storage Requirement: All of segment 1, 6 pages in segment 2, 4 pages in segment 3
Source Language: LAP6-DIAL

DECUS NO. 12-58

FIFOCON

Gerald W. Dulaney, Digital Equipment Corporation, Maynard, Massachusetts

FIFOCON is a File Format Converter program to transfer integer fraction or floating point format data files into any of those formats. Input can be by block number or filename, output is in DIAL file format and can handle double precision integer input or output.

Minimum Hardware: PDP-12/30 (8K, LINCtape, etc.)
Other Programs Needed: FOCAL-12, DIAL-MS
Source Language: FOCAL-12

DECUS NO. 12-59

FOCPLOT

R. Thomas Divers, Case Western Reserve University, Cleveland, Ohio

FOCPLOT is an interactive program to plot FOCAL-12 generated data from integer tape files to a digital plotter. Annotation symbols can be superimposed on the data. Point plot or continuous (straight line between adjacent points) curves may be specified. A short overlay is provided to permit annotated axes and a legend.

Minimum Hardware:	8K PDP-12, LINCtape, Digital Plotter (CalComp or equivalent) VR-12, TTY
Other Programs Needed:	DECUS NO. 8-168, QANDA (both incorporated), LAP-6, DIAL-MS
Storage Requirement:	100-153, 2400-11665
Restrictions:	Maximum of 767 points can be plotted
Source Language:	LAP-6, DIAL-MS

DECUS NO. 12-60

SUMER (French)

J. F. Champarnaud and F. H. Bostem, Liege, Belgium

This French language version of HAMURABI (The Sumer Game, FOCAL8-5) is available on both paper tape and PDP-12 LINCtape. On the LINCtape, both FOCAL, 8K and FOCAL SUMER lists are included.

Minimum Hardware:	8K PDP-8 or PDP-12
Source Language:	8K FOCAL '69

DECUS NO. 12-61

Generating Random Numbers with FOCAL

W. Siegel, K. Whittle and J. Siegel, University of Western Ontario, London, Canada

This program provides a patch to correct the problem with FOCAL's random number generator. This routine was an algorithm developed by Green, Smith and Klem (1959) which has several advantages for use with minicomputers. First, unlike most such generators, it uses an addative rather than a multiplicative process; addition is much faster than multiplication with most machines. Second, the routine is relatively short and third, it has been documented and tested and its characteristics are known. A listing for the patch for FOCAL-12 is provided, but other versions of FOCAL may be modified with similar changes. Three short general programs are included which type out sequences of random integers.

Minimum Hardware:	PDP-8 or PDP-12
Other Programs Needed:	FOCAL, FOCAL-12
Source Language:	Assembly Language

DECUS NO. 12-62

RUFUS

David M. Stern, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado

RUFUS is a display-oriented programmable spectral analysis system. Basic data structures are 512 point vectors which are stored in 6 registers in memory. These registers may be manipulated by a powerful set of commands.

Minimum Hardware:	8K PDP-12/30, 2 LINCtape drives (KW12A real time clock, CALcomp 565 plotter, card reader and LP-8 line printer optional)
Storage Requirement:	8K and overlay storage on LINCtape
Source Language:	PAL

DECUS NO. 12-63 (See also DECUS NO. 12-144)

OLFFT1 and FETCHFFT

R. Cooper, P. V. Pocock, W. J. Warren, Burden Neurological Institute, Stapleton, Bristol, England

OLFFT1 will analyze (continuously or non-continuously) time-series data into power spectra using the Fast Fourier Transform and store the spectra on LINCtape.

FETCHFFT will retrieve spectra stored by OLFFT1 for further inspection including, displaying and plotting.

Minimum Hardware:	PDP-12/30, 8k memory; KW12A Real Time Clock; A/D converters
Source Language:	DIAL

DECUS NO. 12-64

Walsh Transform Subroutines, PWALSH and LWALSH

Major Tom G. Purnhagen, Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio

PWALSH and LWALSH are PDP-12 subroutines, written in PDP-8 mode and LINCmode respectively, which compute the "natural" Walsh transform of an $N=2^K$-element array of data. As listed, the programs operate on an array of 256 points (k-8). Modification for different values of K is described in the program write-up

Minimum Hardware:	PWALSH: Any PDP-8 or PDP-12; LWALSH: Any PDP-12
Storage Requirement:	50-54 Locations, plus data and work area
Source Language:	LAP-6/DIAL (PWALSH is compatible with PAL III

DECUS NO. 12-65

PISH - Poststimulus Time and Interspike - Interval Histogram

Dr. D. J. Woodward, University of Rochester
Submitted by: Ron Carter, Digital Equipment Corporation, Maynard, Massachusetts

PISH consists of two programs, ISH (interspike interval histogram) and PSTH (poststimulus time histogram). ISH and PSTH compute density histograms of the frequency of time intervals between events or of frequency of events after synchronizing or stimulating pulses. The programs are capable of analyzing times of occurrence of single events and of groups of events defined as bursts.

Minimum Hardware:	8K PDP-12, KW12A, LINCtapes
Source Language:	DIAL

DECUS NO. 12-66

ADDINDX (LAP6-DIAL-MS Index Manipulator)

Roger C. Tindle, U. S. Dept. of Interior, Fish-Pesticide Research Laboratory, Columbia, Missouri

ADDINDX allows the user to enter, delete or search for programs in the DIAL index. The major value of the program is that new entries may be specified in the tape area above Blk 777. The program is essentially a handler for the subroutine set MILDRED. QANDA is used for the display frames.

Minimum Hardware:	8K PDP-12/20; supports multiple tape units and RK8 or RSØ8 disk
Other Programs Needed:	QANDA (DEC-12-FISA), MILDRED (DEC-12-FZDA), uses DIAL-MS I/O routines
Restrictions:	A DIAL-MS System tape must be mounted on unit Ø
Source Language:	LAP6-DIAL-MS

DECUS NO. 12-67

PPG FOCAL

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

PPGFOCAL is a modification of DECUS NO. 12-24. It combines the overlays $DEVICE, $CHARS12 and $DTOA. The functions FATN, FCOS, FSIN, FEXP and FLOG have been removed. The system does not check for a negative sign when doing a square root. PPGFOCAL has room for approximately 200 variables.

Minimum Hardware:	12K PDP-12
Source Language:	LAP6-DIAL

DECUS NO. 12-68

A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor

L. G. Boxall and R. H. Abel, Colorado State University, Fort Collins, Colorado

This FPP-12 simulator can be used to directly replace the floating point software package in any PDP-12 assembler program. Enhanced computational speed (5 to 10 times) and smaller core requirements are realized by the use of the FPP simulator. The simulator will accept all of the instructions used in the PDP-8 floating point systems packages, as well as providing many additional programming features.

Minimum Hardware:	PDP-12, FPP-12 Processor
Storage Requirement:	0.7K plus optional routines
Restrictions:	Must be located in field Ø
Source Language:	Assembler-PDP and FPP-12

DECUS NO. 12-69

An On-Line FOCAL-12 Program for Auto-Analyzers

Mack W. Overton, Jr., Larry L. Alber and Dr. Donald E. Smith, U. S. Food and Drug Administration, Chicago, Illinois

This is a program for auto-analyzer data acquisition and reduction on a mini-computer, using an easily constructed interface. Circuit diagrams for the interface are included with the program write-up.

Minimum Hardware:	PDP-12/30 or PDP-12/20 with KW12A clock and 8K core
Source Language:	FOCAL-12

DECUS NO. 12-70

COMPLT

Harry Bryant, Krusen Research Center, Temple University, Philadelphia, Pennsylvania

COMPLT is a SABRised version of the DECUS NO. 8-168 plotting package. It retains all features of that program, with the additional advantage of allowing it to be called as a FORTRAN subroutine.

A DECtape version is available for PDP-8 users.

Minimum Hardware:	PDP-12A
Source Language:	PS-8 SABR

DECUS NO. 12-71

Snoopy Display Program

Mark F. Lewis, Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

This is a paper tape version of the original DECUS NO. L-87. It is now offered in binary paper tape format for both the LINC-8 and the PDP-12. (See DECUS NO. L-87a.) The PDP-12 version has been revised to eliminate the need to use L8SYM when running on the PDP-12

DECUS NO. 12-71 (Continued)

The program displays Snoopy and his Sopwith Camel on the oscilloscope.

Storage Requirement: LIF2: 20-1746; LIF3: 20-647
Source Language: LAP6-DIAL

DECUS NO. 12-72

Four-Point Smoothing With FPP-12

L. L. Alber, M. W. Overton and Dr. D. E. Smith,
U. S. Food and Drug Administration, Chicago, Illinois

This program was developed to smooth an array of up to 4095_{10} data points stored as 1-12 bit words using the FPP-12. Using a 4-point least squares quadratic, the data is floated, fitted, smoothed, fixed and restored in its original location, while displaying on the CRT.

Minimum Hardware: 8K PDP-12 and FPP-12
Other Programs Needed: LAP6-DIAL with FPPASM (on tape)
Source Language: LAP6

DECUS NO. 12-73

8-Point Quadratic Smooth With FPP-12

L. L. Alber, M. W. Overton and Dr. D. E. Smith,
U. S. Food and Drug Administration, Chicago, Illinois

This program has been developed to smooth an array of up to 4095_{10} data points stored as 1-12 bit words using the FPP-12. Using a 8-point least squares quadratic, the data is floated, fitted, smoothed, fixed and restored in its original location, while displaying on the CRT.

Minimum Hardware: 8K PDP-12 and FPP-12
Other Programs Needed: LAP6-DIAL
Source Language: LAP6 with FPPASM

DECUS NO. 12-74

*REGRES - Multiple Linear Regression

David C. Howell, University of Vermont, Burlington, Vermont

This is a multiple linear regression program which handles up to 10 predictor variables. The printout includes the means and standard deviations for each variable, the intercorrelation matrix, the inverse, and the standard and raw score regression weights, as well as the multiple correlation coefficients. No programming knowledge is required of the user once the system is stored on LINCtape and FOCAL-12 has been loaded.

Although no tapes are offered, anyone using this program will have no difficulty entering it from the teletype.

Minimum Hardware: PDP-12 A or B
Source Language: FOCAL-12 running under the DIAL monitor

DECUS NO. 12-75

FORTRAN Subroutines for the PDP-12

Thomas V. McCaffrey, Loyola University Medical Center, Maywood, Illinois

This package consists of eight subroutines and functions written for real time control of the PDP-12's clock display, A to D's sense switches, external line levels, relays and left switches.

The ASCII tape offered with the package is a sample FORTRAN program for a time interval histogram which demonstrates the subroutines.

Minimum Hardware: 8K PDP-12
Other Programs Needed: 8K FORTRAN System or PS/8 System
Source Language: FORTRAN, SABR

DECUS NO. 12-76

TAPELOOK; CORELOOK; SEARCH

David C. Freeman, Harvard Medical School, Boston, Massachusetts

TAPELOOK, a DIAL tape examiner, requests tape unit Ø or 1, a tape block (Ø-777), and displays it as a plot, text, or LINC code. Tape block may be advanced or backed up from the teletype, or a new block requested. The index may be displayed in DIAL format with correct line numbers.

CORELOOK is usually loaded into an unused instruction field. It can then examine 8K of core, displaying as octal, text, or LINC code. A map of any field may be displayed showing all non-zero locations, and a cursor to display any ten locations.

Given a search word, SEARCH will examine the DIAL source working area, and display every line which contains the search word, with correct line numbers.

Minimum Hardware: 8K PDP-12 with display and analog channels
Source Language: LINC Code

DECUS NO. 12-77

PAL12A Assembler

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

PAL12A provides users of smaller PDP-12's with capabilities formerly available only to those with 8K or more. These capabilities include 8-mode literals and off-page links, "LISTAPES," core usage maps and chained assemblies.

Minimum Hardware:	4K PDP-12, 2 LINCtapes, Scope, TTY
Other Programs Needed:	4K LAP6-DIAL-V2
Storage Requirement:	All of 4K
Restrictions:	Will run on 4K only. For others see write-up
Source Language:	PAL12A

DECUS NO. 12-78

PUBPLOT

William L. Rankin, Veteran's Administration Hospital (116), San Francisco, California

PUBPLOT was written to produce graphic plots suitable for many publication purposes. All input is through the teletype. When fully utilized PUBPLOT produces a graph with X and Y axes, numerical and character headings for both axes, seven lines of any shape, and a scattergram. Any of these segments of the graph may be deleted according to program specifications.

Minimum Hardware:	4K PDP-12, TTY, COMPLOT DP-1-1 or equivalent
Restrictions:	Maximum of 1024_{10} input characters and values
Source Language:	8-Mode and LINC Assembly Languages

DECUS NO. 12-79

Modified ADTAPE

William E. Hatcher, III, Veteran's Administration Center, Temple, Texas

This patch to ADTAPE will permit ADTAPE to store data on a LINCtape of 896 (1600_8) standard blocks. Data files may begin in any block and may be continuous over blocks 511 and 512 (777_8 and 1000_8). The experiment parameters can be stored in any of the 896 blocks.

Minimum Hardware:	PDP-12/20
Other Programs Needed:	ADTAPE (DEC-12-SE2E)
Storage Requirement:	Same as ADTAPE plus locs 7600-7606, 7500-7507, 7700-7706
Source Language:	LAP6

DECUS NO. 12-80

FOCAL-RT

William Siegel and Keith Whittle, University of Western Ontario, London, Canada
Submitted by: Kenneth Ellson, Digital Equipment Corporation, Maynard, Massachusetts

Modifications of FOCAL-12 that include device-independent chaining of FOCAL and assembly-language programs, computed GOTO and DO commands, new FRAN( ) function, FIN ( ) and FOUT ( ) to handle character strings in FOCAL files, subroutines for opening and closing FOCAL files within assembly-language programs, LPØ8 printer option, return-to-DIAL command, and expanded text buffer.

Minimum Hardware:	8K PDP-12, LINCtapes or Disk
Other Programs Needed:	DIAL-MS Monitor
Source Language:	FOCAL, DIAL

DECUS NO. 12-81

VR12 SCOPE HANDLER FOR OS/8

Mario DeNobili et al
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

This is a two-page handler for the PDP-12 VR12 scope. Display freezes when scope fills up. You go to next scope page by typing any character. Very useful with PIP.

Minimum Hardware:	PDP-12, PS/8 configuration
Other Programs Needed:	PS/8 system
Storage Requirement:	2 pages
Source Language:	PAL-8

DECUS NO. 12-82

LAP6-DIAL TO PS/8 SOURCE FILE CONVERTER

Mario DeNobili
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

This program allows you to convert source files stored on LAP6-DIAL LINCtapes (4ØØ words per block) to any PS/8 file. It runs under PS/8.

Minimum Hardware:	PDP-12, PS/8 configuration
Other Programs Needed:	PS/8 system
Source Language:	PAL-8

DECUS NO. 12-83

$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN

A. S. Craig, Research Dept., Lakeshore Psychiatric Hospital, Toronto, Ontario

This program produces the standard ANOVA Table for a Repeated-Measures Design.

DECUS NO. 12-83 (Continued)

Minimum Hardware:	PDP-12 with 8K core
Other Programs Needed:	FOCAL 12 with extender patch as per FOCAL 12 Manual Appendix E
Restrictions:	Number of subjects and treatments ≤ 57; Number of subjects and treatments ≤ 850
Miscellaneous:	Reference: B. J. Winer, Statistical Principles in Exp't Design 2nd edition, chapter 4, 1971
Source Language:	FOCAL

DECUS NO. 12-84

AVERAGER

Richard W. Reeder, State University of New York, Stony Brook, New York

Used to simultaneously average 5 channels of analog data such as EEG, ECG, etc. and store the average on LINCtape.

Minimum Hardware:	8K, EAE, KW12A, TU55 (2) A/D
Storage Requirement:	0-2000, 4000-7777; field 1 0000-7777
Source Language:	DIAL

DECUS NO. 12-85

APOLLO 12

Andres J. Magre, COASIN S. A., Buenos Aires, Argentina

Simulates the Apollo descending on the moon surface. The operator governs the fuel rate. The program takes the fuel rate and makes all calculations every one second, thus operating in true real time. Indicators and time-altitude diagram are displayed.

Two versions are supplied, the second of which uses the sense switch to guard against over-enthusiastic players.

Minimum Hardware:	PDP-12A 8K
Other Programs Needed:	Version 1: FOCAL-12 interpreter Version 2: FOCAL-12 and DECUS NO. 12-24
Miscellaneous:	This is a modification of "Moon Landing" demo program published in DEC-08-XJFB-D FOCAL Demonstration Programs
Source Language:	FOCAL-12

DECUS NO. 12-86

ORGAN-AA and ORGAN+BA

Andres J. Magre, COASIN S. A., Buenos Aires, Argentina

Program to allow use of the PDP-12 to simulate organ music. Two versions are supplied. One allows the user to play directly from the keyboard. The second is similar, but the notes are first stored in core and retrieved consecutively each time any key is struck.

Minimum Hardware:	PDP-12, 4K core
Storage Requirement:	Approximately one 8-mode page Variable from there
Source Language:	PAL III

DECUS NO. 12-87

ONDISK-OFFDISK

R. D. McCook and T. V. McCaffrey, Department of Physiology, Loyola University, Maywood, Illinois

The two programs, OFFDISK and ONDISK, provide the capability of easily dumping the contents of a DF/DS-32 disk onto LINCtape and restoring the disk with the tape image at a later time. The disk image files are indexed and filed under the DIAL monitor and up to five disk images can be stored on a 1600 block LINCtape.

Minimum Hardware:	8K PDP-12, TU-55 tape transport DF-32 disk
Other Programs Needed:	DIAL-V2 (supplied)
Storage Requirement:	8K can be modified for 4K
Restrictions:	Restricted to DF/DS-32 disk
Source Language:	DIAL

DECUS NO. 12-88

OCTALFPP

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

An octal translation of a single length floating point package for use on a PDP-12 computer. Inputs, outputs, does various floating point operations on floating point numbers.

Minimum Hardware:	PDP-12A
Storage Requirement:	Locations 40-61, 5600-7577
Source Language:	DIAL-V2

DECUS NO. 12-89

BUTFLTR

Arnold Gershon
Submitted by: Proffesor Se Jeung Oh, City College, New York

An engineer-interactive design program for the PDP-12. Will display frequency response of low pass Butterworth filter of order $1 \leq n \leq 64$ and calculate parts valves for same for any cutoff frequency and any matched input/output impedance.

Minimum Hardware:	PDP-12A
Other Programs Needed:	OCTALFPP (DECUS NO. 12-88)
Storage Requirement:	With OCTALFPP approximately 2600 words
Source Language:	DIAL-V2

DECUS NO. 12-90

REPRSNT

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Formulates octal representation of floating point numbers required as constants. Program inputs a number from teletype then outputs the correct octal representation of the number.

Minimum Hardware:	PDP-12A
Other Programs Needed:	OCTALFPP - DECUS NO. 12-88
Storage Requirement:	74_8 words plus approximately 2000 words for OCTALFPP
Source Language:	DIAL-V2

DECUS NO. 12-91

OCTPUNCH

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Program will punch a source paper tape containing the octal equivalent of a specified section of core. This tape can then be assembled at a later time faster than its original source could be and without any conflicting symbols which the original might have contained.

Minimum Hardware:	PDP-12A
Storage Requirement:	143_8 words
Source Language:	DIAL-V2

DECUS NO. 12-92

PDP8TO12

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Short utility routine for making a source tape produced by a PDP-8 acceptable to a PDP-12.

Minimum Hardware:	PDP-12A
Storage Requirement:	18 words
Source Language:	DIAL-V2

DECUS NO. 12-93

TRANS

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Will translate a BIN paper tape to an octal source paper tape. The octal source can then be assembled together with other routines. In addition, the translation will satisfy any curiosity about what a particular BIN tape contains.

Minimum Hardware:	PDP-12A
Storage Requirement:	73_8 words
Source Language:	DIAL-V2

DECUS NO. 12-94

DATAN

Pietro Morasso
Submitted by: Jean Graham, M.I.T., Cambridge, Massachusetts

DATAN is used to analyze psychophysical and neurophysiological data, collected on DECtapes. Analysis is done with a number of computing modules, which execute simple operations like smoothing, scaling, linearizing, computing calibrations, measurements and derivatives, etc. Linking different modules may be manual or automatic.

Minimum Hardware:	PDP-12B (8K) + 2 LINCtape units + 1 RSØ8 or RK8 disk
Other Programs Needed:	FOCAL-12
Storage Requirement:	8K
Source Language:	FOCAL-12

DECUS NO. 12-95

PDP-12 PS/8 Utility Programs

Charles M. Moore, III, 1700 Sunset Blvd., Houston, Texas

This package contains the following utility programs, along with their sources.

1) MAGSPY displays the contents of any block on any PS/8 device, using any of several modes selected by the sense switches. Included is a mode which displays PS/8 source files as text listings.

2) INDEX displays PS/8 device indices, deletes files with rubouts, transfers groups of one or more files from one device to another.

3) COPY duplicates entire PS/8 LINCtapes.

4) MARK12 marks LINCtapes.

5) DIALPS copies files from DIAL LINCtape 1 to PS/8 device SYS, automatically converting core-image file headers.

6) PSDIAL copies files from PS/8 to DIAL.

MAGSPY, INDEX and COPY use SABR routine IHELP to display operating instructions. Other SABR or FORTRAN programs can also use IHELP.

Minimum Hardware:	8K PDP-12 with scope
Other Programs Needed:	PS/8 System
Source Language:	SABR

DECUS NO. 12-96A&B

SCOPE and CNGMWA

Carol Horwitz, Philip Reid, Richard LeFaivre (A); Carol Horwitz (B)
Submitted by: Michael E. Clark, Laboratory Computer Facility, University of Wisconsin Medical Center, Madison, Wisconsin

A. SCOPE is a CRT-based editor for the PS/8 (or OS/8) system on a PDP-12. A user-selected portion of the source text is in full view on the CRT during editing. Features include character editing via a key-controlled cursor, full forward and backward movement through the source, the ability to search for specified text strings, and horizontal tabbing. The command set for SCOPE is small and easily learned. SCOPE is based upon the LAP6W (and hence LAP6) manuscript editors.

B. CNGMWA is a support program for SCOPE, the scope-oriented PS/8 editor. CNGMWA may be used to change the size of SCOPE's internal scratch file, allowing larger source programs to be edited.

Minimum Hardware:	8K PDP-12, VR14 CRT or similar CRT
Other Programs Needed:	PS/8 or OS/8
Source Language:	PAL-8 and LAP6W

DECUS NO. 12-97

An Off-Line FOCAL-12 Program for Auto-Analyzer by TWX

L. L. Alber and Mack W. Overton, U. S. Food and Drug Administration, Chicago, Illinois

Data being input by teletype or paper tape reader is displayed on the CRT. Instrument readings are transmitted long-distance to the computer by TWX. Program calculates values for each cup reading, a standard deviation and coefficient of variance report.

Minimum Hardware:	8K PDP-12
Other Programs Needed:	FOCAL-12
Source Language:	FOCAL-12

DECUS NO. 12-98

HERALD - Analog-Digital Average and Standard Error Program

David Johnson, University of Ulm, West Germany

Averages 8 channels of analog data and calculates ± 2 standard error limits. Curves of sequential S.E. also are provided and automatic correction of drift (Zero-Line), calibration data storage on tape, curve display and plotting and data typeout. Allows intra-individual statistical comparison i.e. Evoked Potentials.

Minimum Hardware:	8K PDP-12 with A-D, VR-12 Display, basic LINCtape system, ASR33, KW12, KE12
Restrictions:	+0.5 volts continuous input
Source Language:	LAP6

DECUS NO. 12-99

A Set of Spectral Programs

Cyril H. Nute, Naval Medical Neuropsychiatric Research Unit, San Diego, California

XSPECT is a pair of programs written for the PDP-12 computer. Program XS , written in DIAL , accepts 2048 digital data measurements for each of two EEG channels, written on one reel of LINCtape mounted on Unit 0. This input record may be created from analog voltages input to the AD12 analog-to-digital converter, using the two D.E.C. programs, ADTAPE and ADCON . The output of programs XS is a three-block record written on the "intermediate output tape," mounted on Unit 1.

The second program of the set is $XS, written in FOCAL-12, under the DIAL-MS monitor system. It accepts a three-block intermediate record from the LINCtape mounted on Unit 1, and uses the ASR33 teletype to create a listing of two auto-power density spectra, plus the coherence and phase relationships between the two EEG data channels. Frequencies are written on the left edge of the paper, with each line of output representing a .5-Hz frequency interval.

Minimum Hardware:	8K PDP-12, AD12 analog-to-digital converter, KW12 clock, 2 LINCtape units, ASR33
Other Programs Needed:	DIAL-MS Monitor System, with FOCAL-12; QANDA; FFT (DECUS NO. 8-143)
Restrictions:	Need two channels of input data on LINCtape, sampled at 128 Hz for 16 sec; output resolution in .5 Hz. May be changed by contacting the author
Source Language:	DIAL

DECUS NO. 12-100

MEMO III - A Text Formatting Program

Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

MEMO III is a program written for the OS/8 system to produce paged text with margins from free form text. The intention is to permit the user to produce a readable and neatly formatted copy of text with minimal effort.

MEMO III is a descendant of Gregory Ruth's original program. This version permits output on any OS/8 compatible output device, rather than restricting output to the teletype. Files written for MEMO and MEMO II are compatible with MEMO III.

Minimum Hardware:	PDP-8/12, ASR33 (or equivalent) and either DECtape or disk
Other Programs Needed:	OS/8 Programming System
Miscellaneous:	Same program is available on DECtape as DECUS NO. 8-427b
Source Language:	PAL-8

WITHDRAWN

DECUS NO. 12-101

OS/8 SKED

Mark F. Lewis and Patricia Savage

Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

OS/8 SKED is a modification to DECUS NO. 8-465 that permits the user to take advantage of the device-independence of OS/8 for compiling and running SKED programs.

Minimum Hardware:	12K for compiler, 8K for run-time system, OS/8 configuration, 100 cycle real time clock, interface
Other Programs Needed:	OS/8 (DECUS NO. 8-465)
Source Language:	PAL-8

DECUS NO. 12-102

A Manual for the PDP-12 Operator

Peter Hiscocks, Ryerson Polytechnical Institute, Toronto, Ontario, Canada

Most manuals are for the computer; this one is for the operator. Its purpose is to clarify operating procedures for the PDP-12 console, paper tape loaders, DIAL Operating System, Peripheral Interchange Program (PIP) and the special PDP-12 peripherals. It was written primarily for students.

DECUS NO. 12-103

$HAPPY

Roger C. Tindle, Columbia, Missouri

This program generates a happy-face display on the VR12 scope.

Minimum Hardware:	PDP-12, VR12 scope
Source Language:	FOCAL-12

DECUS NO. 12-104

CORDATFP

Ray Cooper, Burden Neurological Institute, Stapleton, Bristol, United Kingdom

CORDAT computes cross-correlation of two blocks of data stored on Unit 1 with ± 64 (lag and lead) points. Displays on oscilloscope and plots on incremental plotter.

Minimum Hardware:	8K PDP-12, Plotter (optional)
Other Programs Needed:	FPP 12
Source Language:	DIAL MS/LAP6

DECUS NO. 12-105

DATAFILE and DFUPDATE

C. M. Malpus, Ph.D., University of Leeds, Department of Physiology, Leeds, United Kingdom

DATAFILE is a LINCtape-based display-interactive library designed primarily as a transparent system by which data from user programs can easily be stored, edited and retrieved. The only addition needed to any user program to add filing capabilities is a short loader routine, and only one memory location is modified when the program is restarted.

Binary programs can also be stored and DATAFILE can be used as a free-standing library system, started from the console and capable of loading and starting the binary programs filed within it.

DATAFILE thus takes over the binary library and loading facilities of DIAL, and can additionally be called from (and exit to) user programs to file resultant data. Because of its compactness and its increased file and index space it is much more efficient, as well as easier to use, than DIAL for debugged, operational programs.

DFUPDATE is the means by which new binary programs are added to a DATAFILE program library. Programs are transferred from the DIAL binary working area on a LINCtape to a DATAFILE file on the same or another LINCtape, and the index updated accordingly. Once filed by DFUPDATE, such programs can be loaded and started by DATAFILE.

Minimum Hardware:	VR 12/14, TC12, TU55 or TU56, TTY, AD 12
Restrictions:	DECtape Handlers only. No disk I/O
Source Language:	DIAL

DECUS NO. 12-106

$PLOT

Frank Sandy, Raytheon Research Division, Waltham, Massachusetts

This is a FOCAL-12 overlay that allows an incremental digital plotter to be operated from a FOCAL program on a PDP-12. It can be used to draw lines or points with FOCAL's extra function FX, or to draw characters with FOCAL's extra function FZ.

Editor's Note: There is another $PLOT routine included in OVERLAYS TO FOCAL-12 (DECUS NO. 12-24)

Minimum Hardware:	8K PDP-12, LINCtape or disk, Digital Incremental Plotter
Other Programs Needed:	FOCAL-12 and $CHAR (included on tape for $PLOT)
Storage Requirement:	Overlay locations 4247-4612
Restrictions:	Limited by plotter for lines, slightly slower for characters
Source Language:	LAP6

DECUS NO. 12-107

AVUPTO8, AVUPTO8S

A. M. Halliday, Medical Research Council, National Hospital, London, United Kingdom

A flexible multichannel averaging program for evoked responses, allowing choice of number of sweeps, channels and sampling rate via the teletype. Averaged data can be stored or retrieved from tape (1600 blocks with AVUPTO8S) and plotted out. Display monitors running sum or current input. The averaging sweep is triggered by an external pulse on the chosen sync input.

Minimum Hardware:	8K PDP-12A, KW12, Houston Complot DP1, XY plotter
Other Programs Needed:	LAP6-DIAL
Restrictions:	Up to 8 channels. Maximum sampling rate: 10 Kcs/number of channels chosen
Source Language:	LAP6-DIAL

DECUS NO. 12-108

FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler

Juergen Stegemann, M.D., Deutsche Sporthochschule Cologne, Cologne, West Germany

For a PDP-12 user it is a serious disadvantage that the FPP Assembler (DEC-12-AQZA-D) is not able to produce LINC codes and that it does not work with one DF32 in connection with LINCtapes. Therefore an improved program is offered to get nearly full compatibility to the DIAL-MS assembler as well as to the FPP system. Since the DIAL-MS assembler has no advantage any more, it was replaced by the new program. Some additional features are added, which are not included in both assembly programs now.

Minimum Hardware:	8K PDP-12A, 1MC12, 1FPP12, 1DF32
Other Programs Needed:	DIAL-MS
Source Language:	Assembler

DECUS NO. 12-109 A,B,C

QNANSWER, QANDATTY, SUPRSHUF

Ronald W. Wood, University of Rochester School of Medicine, Rochester, New York

A. QNANSWER retrieves information from the QANDA (DEC-12-FISA-D) answer buffer, ignoring terminal null values. The program accepts 8's and 9's as octal 10's and 11's. Each question field within a display is limited to a maximum of four characters. The program occupies 38_{10} locations, B16 and B17.

B. QANDATTY prints QANDA (DEC-12-FISA-D) displays and user responses on the teletype. The program occupies 102_{10} memory locations and utilizes Beta registers 2 through 6. It provides the user the option of printing several display lines to the teletype line.

C. SUPRSHUF shuffles data with a pseudo-random algorithm which repeats every 512 non-zero input data points.

Tape contains source files for QNANSWER and QANDATTY, con[illegible] binary and source files for SUPRSHUF.

Minimum Hardware:	4K PDP-12, TTY, scope, 2 tape units
Other Programs Needed:	QANDA (DEC-12-FISA-D)
Source Language:	DIAL-MS

DECUS NO. 12-110

DIAL-MS for 1600 Blocks

David Goodman, Psychophysiology Laboratory, V.A. Hospital, Bedford, Massachusetts

DIAL-MS, version SE2E, cannot directly access LINCtape blocks greater than 777 in any of its operations. DIAL-MS for 1600 Blocks, by means of patches to most of the routines and reassemblies of the ADD PROGRAM routine and PIP, has been modified to access all 1600 blocks in all of its routines.

Minimum Hardware:	8K PDP-12, 2 LINCtapes marked with 1600 (octal) standard blocks
Restrictions:	Has not been tested on a disk system
Source Language:	DIAL-MS

DECUS NO. 12-111a

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Pennsylvania

ADFILE, a modification of ADTAPE to run under PS/8 on a PDP-12A, is a data acquisition program that permits from one to sixteen AD12 A/D channels to be sampled consecutively.

Minimum Hardware:	8K PDP-12A with KW12A, AD12, (RF08 disk optional)
Other Programs Needed:	PS/8 Operating System
Restrictions:	Must be run on a PDP-12A with LINCtapes or RF08 disk as output device; PS/8 or OS/8 must be built with CONFIG - not BUILD
Source Langauge:	PAL-8

DECUS NO. 12-112

IDXRDD

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Pennsylvania

IDXRDD is a collection of FORTRAN callable subroutines for reading PS/8 unformatted data files, such as the output for ADFILE (DECUS NO. 8-211a). The subroutines contained in the package are: INDEX, RDHAN and NAMUD.

DECUS NO. 12-112 (Continued)

INDEX will perform a directory search on a device file specified at the keyboard by the user in a standard PS/8 command line.

RDHAN allows reference for reading last device handler specified in a call to INDEX.

NAMUD allows file name specified in INDEX to be incremented by octal one forming a new file name. Then the device directory is searched for the new file name.

Minimum Hardware:	PDP-12A, TTY, Tapes, Disk
Other Programs Needed:	PS/8 monitor
Restrictions:	All subroutines must occupy same LINC segment
Source Language:	SABR

DECUS NO. 12-113

IDXWT

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Rennsylvania

IDXWT is a group of FORTRAN callable subroutines needed for writing unformatted data files on a PS/8 device. The subroutines are FOPEN, FCLOSE, WITHAN and NAMUP.

FOPEN performs a file search and opens a tentative file on a PS/8 device. WITHAN allows the user to write unformatted files on the PS/8 device loaded when FOPEN was called. FCLOSE closes the tentative file opened in FOPEN. NAMUP allows the file names specified in FOPEN to be incremented by octal one forming a new file name. A tentative file is then opened using the new file name.

Minimum Hardware:	PDP-12A, TTY, LINC, Tape, Disk
Other Programs Needed:	PS/8 monitor
Source Language:	SABR

DECUS NO. 12-114

FOCAL-PL

T. V. McCaffery and R. D. McCook, Dept. of Physiology, Loyola University, Maywood, Illinois

This is a modification of FOCAL-12 which allows data plotted on the screen to be transferred to a digital plotter. This program works with a Houston DP-1 plotter, but others could probably be used. It does not occupy any user space but uses the scope text buffer, thereby making the scope text feature inoperative.

Minimum Hardware:	8K PDP-12, Digital plotter, EAE optional
Restrictions:	Destroys text storage on scope
Source Language:	DIAL

DECUS NO. 12-115

PLOT3D, Pseudo 3-Dimensional Perspective Display for the PDP-12

Michael F. Lubozynski and John A. Freeman, Vanderbilt University School of Medicine, Nashville, Tennessee

PLOT3D is a LINC-mode program which will produce a pseudo 3-dimensional display of up to 16 256-word waveforms, shown at any desired perspective (and scale) and interconnected by a user-specified number of contour lines.

Minimum Hardware:	8K PDP-12
Restrictions:	All input must be in octal
Source Language:	DIAL-MS

DECUS NO. 12-116

FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals

L. L. Alber, M. W. Overton and Dr. D. E. Smith, U. S. Food and Drug Administration, Chicago, Illinois

An 8-point least-squares fitting algorithm for the FPP-12 is used as a subroutine of FOCAL-12 to reduce Auto Analyzer data previously stored on LINCtape by ADTAPE/ADCON operating on-line with up to 16 instruments.

Minimum Hardware:	8K PDP-12, 2 LINCtape units, 1 DF32 disk, FPP-12
Other Programs Needed:	FPPASM Assembler
Source Language:	LAP6-DIAL and FPPASM

DECUS NO. 12-117

TAPEDIT; A PDP-12 LINCTAPE EDITOR

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

TAPEDIT provides a quick and efficient means of inspection and modification of data contained on LINCtape. It is an improvement over previous 4K tape editors in that its principal output device is the VC12 scope. Output may also be directed to the console teletype. Data may be interpreted as octal values, DIAL sixbit characters, or PDP-10 sixbit characters. Word search and data move functions are also provided. TAPEDIT will operate properly with tapes up to 4096 blocks long and with blocks containing up to 512 data words.

Minimum Hardware:	PDP-12A or 12/20 (Scope, LINCtape and A/D channels)
Source Language:	LAP6-DIAL V2

DECUS NO. 12-118

Average Transient Advanced Programs

C. M. Malpus, Ph.D., Department of Physiology, University of Leeds, Leeds, United Kingdom

These programs each offer advances over previous DEC or DECUS average transients construction programs. Both are easy to use with flexible very fast (30 usec point minimum) data collection routines. AVTRCOMP allows non-simultaneous collection of up to four transients, with commands for subsequent arithmetic combination, cross-comparison, differentiation and integration. AVDEVVAR collects one transient only, but calculates the variance of each point; thus confidence limits or a variation envelope can be placed on an average transient, allowing significance of difference assessments to be made.

These programs may be located and run from standard DIAL file, but are optimally used in conjunction with the DATAFILE library facility, in order to store collected data on LINCtape.

The LINCtape supplied contains binaries and sources of both programs, filed under DIAL; in addition a DATAFILE library system containing the two binaries occupies the low end of the tape. This area is reserved in the DIAL index.

Minimum Hardware: PDP-12, KW12, VR12, AD12, TTY
Storage Requirement: 4K for AVTRCOMP, 8K for AVDEVVAR
Source Language: DIAL

DECUS NO. 12-119

Neurone Spike Train Analysis Programs

C. M. Malpus, Ph. D., Department of Physiology, University of Leeds, Leeds, United Kingdom

Three of the basic presentation methods for single neuron spike train data are carried out by these programs. A flexible data collection routine allows simultaneous collection of two independent spike trains. FREQHIST constructs instantaneous frequency histograms, PSTMHIST constructs post-stimulus histograms and INTVHIST interval histograms. All displays are fully calibrated and can be scaled and expanded by the operator. FREQHIST and PSTMHIST can simultaneously collect one channel of analog information for later monitoring or cross-correlation.

These programs may be loaded and run from standard DIAL files, but are optimally used in conjunction with the DATAFILE library facility, in order to store collected data on LINCtape.

The LINCtape supplied contains binaries and sources of all three programs filed under DIAL. In addition a DATAFILE library system containing the three binaries occupies the low end of the tape. This area is reserved in the DIAL index.

Minimum Hardware: 4K PDP-12, KW12, VR12, AD12, TTY
Source Language: DIAL

DECUS NO. 12-120a

DUAL Assembler

John R. Raines, Northwestern University Medical School, Chicago, Illinois

DUAL is derived from QUIP, DECUS NO. 12-54. It has been given extra pseudo-ops, etc. to make it nearly DIAL compatible. In addition, it offers literals; address multiplication, division and rotation; several fold increase in assembly speed; a second set of conditional assembly pseudo-ops and some additional pseudo-ops. Updated August 1973.

Minimum Hardware: PDP-12 with DIAL-MS and EAE, TTY, preferably ASR35
Source Language: DUAL

DECUS NO. 12-121

Arrhythmia Detection and Categorization

Roy James Stanfill, Bioengineering Division, University of Washington, Seattle, Washington

This is a real-time QRS detection and analysis routine based upon R-wave slope detection. The ECG, filtered from 3 Hz to 40 Hz, is input to the A/D Converter. Each QRS is compared with a stored average and judged normal or abnormal; the R-R interval is also checked to determine whether the beat is early or late. Several displays are available. Every 10 minutes, or upon request, the number of beats and arrhymias for the preceding 10 minutes, are typed out. If a Tektronix video terminal and hardcopy unit are available, copies of the displays can be made via the sense switches and relays.

Minimum Hardware: 5K; PDP-12; EAE
Source Language: DIAL-MS

DECUS NO. 12-122

PDP-12 User's Monitor Command

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

This is an implementation of the DIAL user's monitor command functions as an extension of the 4K LAP6-DIAL-V2 system. It provides the user of such a system with a convenient way to zero the working area of any tape unit, merge binary files, and respecify the assembler permanent symtol tables.

Minimum Hardware: Same as 4K DIAL
Other Programs Needed: LAP6-DIAL
Source Language: LAP6-DIAL

DECUS NO 12-123a

OS/8 VR12 Handler

Edward Rapoport, Institute of Child Development, University of Minnesota, Minneapolis, Minnesota
Revised by: Roger Abel, Colorado State University, Fort Collins, Colorado

The VR12 handler is an OS/8 - PS/8 output handler which utilizes the standard VR12 cathode ray tube display of the PDP-12 as a standard OS/8 device-independent output device. This two page handler displays ASCII text frame by frame with the user controlling the advancing of frames from the console keyboard.

Minimum Hardware:	8K PDP-12 with VR12 scope
Other Programs Needed:	OS/8 BUILD or CONFIG source
Restrictions:	Output buffer must begin on even address. Binary is in OS/8 Build device handler format
Source Language:	PAL-8

DECUS NO. 12-124

FR, FDIS and FADC for PDP-12 Input/Output

Lawrence Moss, Cardiopulmonary Lab., University of Vermont, Burlington, Vermont

Three special patches to PS/8 FOCAL are implemented for use with the special LINC mode input-output devices of the PDP 12. These are FADC for the analog-to-digital converters, FDIS for the KW12 (KW14) display, and FR which will sample the sense switches and turn any relay on or off.

Minimum Hardware:	8K PDP-12 with mass storage device
Other Programs Needed:	PS/8-12, OS/8-12, OMSI PS/8 FOCAL (DECUS FOCAL8-177)
Source Language:	PAL-8

DECUS NO. 12-125

Waveform Analysis

Roy James Stanfill, University of Washington, Seattle, Washington

This is a real-time waveform analysis routine. The waveform is sampled and continuously displayed. The waveform can be frozen, via the sense switches, and the minimum and maximum values of the waveform determined (and indicated). Two cursors, controlled by the A/D Converter pots, are displayed congruous to the waveform; their horizontal and vertical absolute differences are displayed. The routine is particularly useful for analysis of physiological signals, i.e., calculation of QRS width, S-T interval, R-R interval, etc.

Minimum Hardware:	PDP-12 with TTY, API and EAE, KW12
Source Language:	DIAL-MS

DECUS NO. 12-126

WAVEFORM: Evoked Potential Analysis

T. Joe Willey, School of Medicine, Loma Linda University, Loma Linda, California

This program reads single or double-precision data from LINC-tape; displays a waveform, baseline and cursor; and finds peaks and zero-crossover points for principal evoked potential deflections. The complex waveform is reduced to fundamental waveform descriptors in terms of amplitude, latency, rise, fall and peak area. The program also estimates coefficients to an elemental waveform involving a damped sinusoidal function that characterizes the evoked potential. The program has general application in neurophysiology but may be useful to other kinds of problems involving data reduction and analysis.

Minimum Hardware:	8K PDP-12, EAE, VR12, 2 LINCtapes, TTY, A/D Converter
Source Language:	LAP6-DIAL-MS

DECUS NO 12-127

Withdrawn

DECUS NO. 12-128

GEP: A Generalized Experimental Package

Gregg C. Oden and Stanley Wong, Department of Psychology, University of California at San Diego, La Jolla, California

The Generalized Experimental Package is designed to allow the naive user of a PDP-12 to utilize its full capabilities in running a broad range of judgmental experiments in psychology, sociology, economics, etc.

The dual channel facilities of the VR-12's or VR-14's are used to allow installations with two external scopes to run two subjects completely independently; each subject may proceed at his own rate and each receives a different randomized presentation sequence. The stimuli may be any set of verbal materials, including personality trait adjectives, short sentences, product names, etc. Responses are made through use of a continuous graphic rating scale which is drawn on the scopes.

The user specifies the characteristics of his experiment with a simple conversational initialization program. This program requires no knowledge of system details and need only be run once for each new experiment.

Minimum Hardware:	PDP-12, 4K, TTY (2 external VR-12's or VR-14's to run 2 subjects)
Other Programs Needed:	Pseudo Random Number Generator (DECUS NO. L-64)
Source Language:	LAP6

DECUS NO. 12-129

OS/12S Scope Monitor Operating System

D. Lloyd Rice, University of California at Los Angeles, Los Angeles, California

This modification of OS/12 provides scope display of the user interaction for both monitor and command decoder lines. Teletype echo may be turned on or off by control characters. The scope routines are swapped out so they are invisible to all programs, making the system functionally identical to OS/12.

Minimum Hardware:	8K PDP-12 with mass storage device
Source Language:	PAL-8

DECUS NO. 12-130

COMPARE - Fast LINCtape Compare

James C. Good. Jamesville-DeWitt Central Schools, Syracuse, New York

COMPARE is an efficient means for 4K PDP-12 users to compare blocks on LINCtape. It recognizes extended units and utilizes extended addressing. The program compares 7 blocks at a time, although to minimize tape motion it alternates the reading of "from" and "to" blocks. I. E. it will alternate reading "from" & "to" blocks with reading "to" & "from" blocks. So in effect the program compares 14 blocks at a time. It also allows the user to limit the comparison to a specified section of each block.

Minimum Hardware:	4K PDP-12, TTY, TC12, One LINCtape drive
Other Programs Needed:	PAL 12-A Assembler (DECUS NO. 12-77)
Restrictions:	Must be assembled with PAL 12-A Assembler, maximum block length on tape is 4ØØ words (octal)
Source Language:	PAL 12-A

DECUS NO. 12-131

OS/8 DIBILD - Revised

John C. Alderman
Revised by: Mark F. Lewis, Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

OS/8 DIBILD is a PS/8 or OS/8 utility program to restore directories that have been overwritten. This version is a revision of John Alderman's original program (DECUS NO. 8-599), revised to correct coding that was illegal on straight (or 'classic') PDP-8's. One option has been added.

Minimum Hardware:	Any PS/8 or OS/8 installation with LINCtape
Source Language:	PAL-8

DECUS NO. 12-132

LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12

Larry Davis, Washington University and Torbjorn Alm, Autocode AB
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Modified version of 8-102a for use under OS/8 (PS/8,) OS/12. OS/8, OS/12 file input and output is allowed, which allows the user to prepare LISP programs using OS/8, OS/12 EDIT. Input and output in ASCII. Facilities for writing own code in assembler to be added to the interpreter for evaluation of special functions are provided for.

Minimum Hardware:	PS/8, OS/8 or OS/12
Other Programs Needed:	PS/8, OS/8, OS/12 Operating System
Storage Requirements:	8K
Source Language:	PAL-8

DECUS NO. 12-133

MINT - Multiple Precision Integer Arithmetic Subroutine

Larry Davis , Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Arithmetic and input-output subroutines are provided for multiple precision integers.

Minimum Hardware:	PS/8, OS/8, OS/12
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-134

RWDF32

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

This FORTRAN and SABR callable program allows blocked input and output from DF32 disks where the block size is a parameter.

Minimum Hardware:	PS/8, OS/8, OS/12, DF32 disk
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-135

MAC8, 8K MACRO ASSEMBLER

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MAC8 is an 8K assembler which runs under PS/8, OS/8 or OS/12. It allows macros to be written along with other assembly language instructions.

DECUS NO. 12-135 (Continued)

Minimum Hardware:	PS/8 OS/8, OS/12
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO 12-136

MOVE

Larry Davis, Carl Ralston, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MOVE is an OS/8 program for transferring files from one directory device to another directory device. It is efficient since it reads the input and output device directories only once.

Minimum Hardware:	OS/8, OS/12 configuration
Other Programs Needed:	OS/8 or OS/12, Version 1 (May work with OS/8, V2)
Storage Requirement:	8K
Miscellaneous:	Changes given in document to make MOVE work with PS/8
Source Language:	PAL-8

DECUS NO. 12-137

PAL12D

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

PAL12D (Davis) is a modification of the PAL-8 Assembler to allow either PDP-8 or LINC mnemonics.

Minimum Hardware:	PS/8, OS/8, OS/12 Configuration
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 12-138

ISEL

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

It is often desirable to check if a certain LINCtape unit is selected or write-enabled before doing some operation on it, in order that a message may be printed if not.

ISEL is a FORTRAN or SABR callable function which returns -1 if the unit specified is not selected, returns Ø if the unit specified is selected and not write-enabled, and returns 1 if the unit specified is selected and write-enabled.

Minimum Hardware:	PS/8, OS/12, PDP-12 LINCtape
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-139

BURST Analysis Package

John T. Williams and Thomas L. Babb, U.C.L.A. Center for Health Sciences, Los Angeles, California

This package contains three programs for editing point process data from STAP-12 trains into definable bursts (minimum of two intervals) (BRSTEDIT), which can then be printed sequentially (BRSTPRNT) and stored as a continuous train for statistical analysis (BRSTRAIN).

Minimum Hardware:	4K PDP-12
Other Programs Needed:	STAP-12 (DECUS NO. 12-34)
Restrictions:	Acceptable input limited to stap-12 trains
Source Language:	DIAL-MS

DECUS NO. 12-140

NAEP - Nerve Action and Evoked Potentials

T. J. Willey, N. Fleming and F. Roos, Loma Linda University, School of Medicine, Loma Linda, California

The programs in the NAEP series were developed for investigations of neuro-electric events in the nervous system. Some are specific to a particular environment or experimental outlook but most have general applicability to data processing in the neurosciences. All are called through an executive and are rapidly and easily available for transitions from one to the next. The system is interactive and adaptive to a wide variety of uses.

Minimum Hardware:	8K, A/D converters, VR12, 2 LINC transports, EAE, TTY, Cal-Comp Plotter, X-Y plotter
Restrictions:	Source stored in extended tape format
Source Language:	LAP6-DIAL-MS

DECUS NO. 12-141

$CORREL - Intercorrelation Program for 50 Variables

David A. Paskewitz, Ph.D. and Robert L. Hufgard, Unit for Experimental Psychiatry, Institute of the Pennsylvania Hospital, Philadelphia, Pennsylvania

Reports Mean, Standard Deviation, Sum of Scores, Sum of Squares and Correlation Coefficients for up to 50 by 50 variable matrix. Designed to be both versatile and usable by inexperienced personnel. Once the initial scope-presented dialog is completed and data entered at the teletype, the program will run without further intervention by the user. Options for sub-group analysis with computation of Mean and Standard Deviation, with or without the correlation matrix, are provided.

Minimum Hardware:	8K, Scope, Mass Storage, ASR33
Other Programs Needed:	FOCAL-12 running under DIAL-MS
Source Language:	FOCAL-12

DECUS NO. 12-142

FOCALSD

Mack W. Overton, Jr. and Larry L. Alber, U. S. Food and Drug Administration, Chicago, Illinois

Utilizes the user function as entrance to the FOCAL-12 file storage area.

Minimum Hardware:	DF32 disk
Storage Requirement:	FOCAL-12 (DEC-12-AJAA-D)
Source Language:	DIAL-MS

DECUS NO. 12-143

DSLIS - Dear Start Loader and Index Statistics

Edward Rapoport, University of Minnesota, Minneapolis, Minnesota

Dead Start Loader and Index Statistics is a 3-part utility routine for DIAL residing in DIAL's free blocks. DSLIS allows easy loading of any DIAL program without having to go through the intricacies of the DIAL editor. It is called from a dead start via a simple switch register command (similar to and simpler than DIAL). Then any DIAL program name may be typed in via a QANDA frame and the program is loaded and started.

Another part of DSLIS is called by the DIAL "MC" monitor command. It displays the number of free blocks on a tape or disk and the location and size of the biggest free space. Another "MC" command also unloads all active LINCtapes.

Minimum Hardware:	4K PDP-12 with LINCtape
Source Language:	LAP6-DIAL

DECUS NO. 12-144

ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)

R. Cooper, W. J. Warren, P. V. Pocock, Burden Neurological Institute, Bristol, England

ANECDOTE is a package of 12 programs useful in the analysis of electroencephalographic and other similar time-series data. Included are programs for general data manipulation such as scaling, integrating, rectifying, filtering and also for plotting, averaging, correlation, frequency analysis (FFT) and pattern recognition. Data is assumed stored on LINCtape (1600_8 blocks), 1 sample/block, 1 point/word. Updated versions of DECUS library programs 12-63 are included, as are a few tape handling programs.

The FPP 12 floating point processor is used in two of the programs and a number of them utilize an incremental plotter.

Minimum Hardware:	8K, PDP-12, Incremental Plotter, FPP12, TTY
Miscellaneous:	DECUS library programs DECUS NO. 12-63 are included in updated versions
Source Language:	DIAL-MS

DECUS NO. 12-145a

CREFNMAP

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This is an 8K cross referencer which handles up to 753_{10} symbols and 4095-2*NSYM references. Its main advantage is in its ability to cross reference some programs which are too big for CREF12 (which has a maximum capacity of NSYM*5 + NREF= 4094). CREFNMAP will work with listapes produced by either DIAL or DUAL (DECUS NO. 12-120a). With DUAL listapes, it can produce a core usage map as well.

Minimum Hardware:	8K, EAE, TTY (preferably ASR35)
Other Programs Needed:	DIAL-MS
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-146

$CORR. (FOCAL Version)

Jim Hoare, Lakeshore Psychiatric Hospital, Toronto, Ontario, Canada

This program computes the means and standard deviations and the matrix of correlation coefficients for multivariate data.

For the long version it will take a little time for the results. (Example: 40 minutes for 30 variables by 15 subjects.)

Minimum Hardware:	PDP-12 with TTY
Source Language:	FOCAL-12

DECUS NO. 12-147

*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples

Hermann Kremer, Technische Hochschule Darmstadt, Darmstadt, Germany

This program computes real-valued bandlimited periodic functions and the Hilbert transform of such functions, if a set of equidistant samples is given. The program can be used in electrical engineering and for the approximation and interpolation of functions.

Minimum Hardware:	8K, Magnetic Tape Unit, Display Scope
Source Language:	FOCAL-12 running under DIAL Monitor

DECUS NO. 12-148

STATIS12, A Statistical Package for the PDP-12

P. C. Diegenbach, University of Amsterdam, Amsterdam, Holland

Statistical package with scope displays to chain to 40 chainable FOCAL-12 programs. Included are normal basic statistics for non-grouped and grouped data, t-test, skewness and kurtosis, variance analysis, Sheffe-contrast, regression, correlation, eigen-values, principal axis (with display), comparison with normal, binomial, negative binomial, poisson, hypergeometric and logarithmic distributions and nonparametric statistics.

The user reacts by answering on the TTY the questions on the scope. Knowledge of computer functioning is unnecessary.

Minimum Hardware:	8K, Display, 1 (preferably 2) tape unit(s)
Other Programs Needed:	FOCAL-12, DIAL Monitor
Source Language:	FOCAL-12

DECUS NO. 12-149

XPIP8: PDP-12 DECtape PIP

Douglas E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

XPIP8 is a special version of PS/8 PIP for PDP-12 owners with the TC12-F option. XPIP8 allows direct reading and writing of PS/8-OS/8 DECtapes mounted on any LINCtape drive on a PDP-12. It will only work on those machines equipped with the TC12F option.

Minimum Hardware:	8K, TC12-F option
Other Programs Needed:	PS/8, OS/8 or DECsystem-8 (DECUS NO. 8-646)
Source Language:	PAL

DECUS NO. 12-150

XPIP1Ø: PDP-10 DECtape to LINCtape Converter

Douglas E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

PIP1Ø is a PIP for PS/8 that handles PDP-1Ø DECtapes. This version reads PDP-1Ø DECtapes directly via the TC12F hardware option on PDP-12 LINCtape drives.

Minimum Hardware:	8K PDP-12, TC12-F option
Other Programs Needed:	PS/8, OS/8 or DECsystem 8 (DECUS NO. 8-646)
Source Language:	PAL

DECUS NO. 12-151

"PSYCHO," A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics

Thomas H. Harding and J. Terry Yates, Purdue University, West Lafayette, Indiana

The "PSYCHO" system is an elaborate set of programs which control all facets of an animal psychophysical experiment. The system consists of three separate programs which are simultaneously core resident. The programs control the stimulus presentation and experimental contingencies, collect "on-line" data, analyze the data statistically and summarize the data by means of a teletype "print-out," hard-copy graphs and paper-tape output. The psychophysical method employed is that of Blough. The general method has application to numerous animal psychophysical tasks in which "titration" schedules are used. Instructions for program modification are included in the program text.

Minimum Hardware:	8K and KW12-A clock, ASR33 Incremental Plotter
Other Programs Needed:	Floating Point Program (DEC-12-YQ1B-PB)
Source Language:	DIAL-MS

DECUS NO. 12-152

LOAD31K, A Loader for DIAL-MS and 32K of Core

John R. Raines, Northwestern University Medical School, Chicago, Illinois

The DIAL system offers only an 8K binary work area and hence no facilities for loading programs into memory fields above Field 1. This program loads up to 4 binaries and all but the last 1400 (8) words of core.

Minimum Hardware:	DIAL-MS Configuration, 32K of Core, EAE
Other Programs Needed:	DIAL-MS; DUAL32; CREF32 (These files are all included on tape)
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-153a

DUAL32, DUAL-28K Assembler

John R. Raines, Northwestern University Medical Center, Chicago, Illinois

DUAL 32 derives from DUAL. In addition to the features of DUAL, it has: nestable conditional assemblies, nestable literals, special character for PAL8 compatibility, larger I/O buffers for reduced LINCtape motion, larger symbol table (roughly 2000 symbols), improved listing control for chained assemblies, and provision for producing multi-LISTAPE listings.

Minimum Hardware:	DIAL-MS Configuration, ASR35 preferable, EAE
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-154a

CREF32

John R. Raines, Northwestern University Medical Center, Chicago, Illinois

CREF32 is a 24K version of CREFNMAP. It is much faster, allows more symbols, more references, produces a 32K rather than 8K core map and will process listings which overflow onto a second tape (produced by DUAL32).

Minimum Hardware:	DIAL-MS Configuration, 24K, EAE, ASR35 preferable
Restrictions:	Poor format with undefined symbols on DUAL LISTAPES
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-155

MARK12XØ

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This is a version of MARK12 which includes the 128 word block format. In addition it can determine the tape block size on the tape mounted on unit Ø and can copy tape Ø onto tape 1 after formatting tape 1. The program will bootstrap either DIAL-MS or OS/12 on completion.

Minimum Hardware:	8K PDP-12, DIAL-MS, LINCtape
Source Language:	DUAL 32 (DECUS NO. 12-153)

DECUS NO. 12-156

MUSIC12

Philip H. Jensen
Submitted by: James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

MUSIC12 is a program for the PDP-12 user which allows use of the teletype keyboard as a piano keyboard. There are 4 octaves of notes, including sharps and flats. The music can be played directly from the keyboard, or from previously punched paper tape via the teletype paper tape reader.

Other Programs Needed:	Monitor Command
Source Language:	LAP6-DIAL

DECUS NO. 12-157

PLOTVS, Device Independent Graphics

Dennis McGhie, Stanford Medical Center, Stanford, California

PLOTVS was written to allow plotting on three dissimilar graphics devices from a single set of software. Plotting programs are written to drive an incremental plotter, except the plotter commands are buffered to an OS/8 file. PLOTVS reads this file and plots the picture on an incremental plotter, a storage scope, or a line oriented plotter.

Minimum Hardware:	PDP-12 (or 8/I, 8/L or 8/E), EAE, Incremental Plotter, Storage Scope, Versatec MATRIX 200A Printer/Plotter
Other Programs Needed:	OS/8, User written plotting program
Source Language:	PAL-8

DECUS NO. 12-158

FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's

Mark J. Hyde, Jamesville-DeWitt Central Schools, Jamesville, New York

FASTCOPY provides the 4K PDP-12 user with an efficient means for copying data stored on LINCtape. It operates properly with tapes containing any number of blocks and with blocks of up to 3584 (7ØØØ octal) words. The program adjusts itself to copy the largest group of blocks that will fit in 4K at one time. For example, 256 word blocks are copied in groups of 14 (1Ø). The program also operates correctly on groups of blocks that extend across the transition from negative to positive block numbers.

Minimum Hardware:	PDP-12, TTY, 2 LINCtape drives
Other Programs Needed:	PAL12A (DECUS NO. 12-77) and User's Monitor Command (DECUS NO. 12-122). Both are included on tape
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-159

PLAYBOY

Walter Weiskopf and James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

PLAYBOY prints the image of the playboy bunny in either of 2 colors; black or white, on an 8 1/2 x 11 paper form.

Minimum Hardware:	PDP-12, LS8E or LPØ8 Line Printer (The printing device IOTs can easily be changed.)
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-160

CCTGEN - Carriage Control Tape Generator

James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

CCTGEN will generate carriage control tapes whose form and tab stops are at intervals defined by the operator.

Minimum Hardware:	PDP-12, ASR33
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-161

BIGCHARS

Roy D. Eassa, Jamesville-DeWitt Central Schools, DeWitt, New York

BIGCHARS displays 5 X 7 characters on the VR12 scope and prints enlarged patterns on the LS8E line printer. All printing teletype characters are acceptable.

Minimum Hardware:	PDP-12, VR12 scope, ASR33, LS8E
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-162

COREDIT

Roy D. Eassa, Jamesville-DeWitt Central Schools, DeWitt, New York

COREDIT displays core locations on the scope, prints them out, allows modifications and has a word search option.

Minimum Hardware:	PDP-12, VR12 scope, ASR33
Other Programs Needed:	PAL12A and User's Monitor Command (DECUS NOs. 12-77 and 12-122)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-163

AD74 - High Speed Analog to Digital Conversion Program

Barrie F. Walker, Institute of Oceanography, University of British Columbia, Vancouver, Canada

AD74 is a fast analog to digital conversion program. Analog data input is through the standard 16 channel PDP-12 A-D converter. Digitized data is recorded on 9 track tape with the IBM compatible TU-1Ø drive.

For a single input channel the maximum rate is about 16000 samples/second. This limit is made possible by using the RK8 as a buffer between core and tape.

For applications where an RK8 is not available, or where high speed is not essential, data may be dumped on tape without disk buffering at a maximum rate of about 5000 samples/second.

Minimum Hardware:	PDP-12 A-D inputs, TU-1Ø tape, KW-12A clock, RK8 disk (optional), VR12
Storage Requirement:	8K
Source Language:	DIAL

DECUS NO. 12-164

DIAL.EXT

John R. Raines, Northwestern University Medical School Chicago, Illinois

This is an extension of DIAL-MS for 1600 blocks (DECUS 12-110) which uses tape blocks 356 and 357 to provide 12 additional monitor commands including SQUASH and String search. "AP" has been speeded up. Provision for addition of 7 more commands has been made.

Many of the routines will run in 8K or 12K. Some modifications will be desirable for almost any other installation.

Minimum Hardware:	PDP-12, DIAL-MS Configuration, EAE
Source Language:	DUAL 32 (DECUS 12-153)

DECUS NO. 12-165

NAP SYS: Program to Analyze Neuronal Spike Data

William J. Vaughn
Submitted by: Edward V. Evarts, M. D., National Institute of Mental Health, Bethesda, Maryland

The program accepts as input two channels of analog data, one of which contains pulses at least 1 msec apart and the other being a control signal consisting of seven separate DC voltages. The first channel will usually represent continuous spike activity from a single neuron cell (it should not be the raw recording, however, but the output of a pulse generator whose input is the raw neuron potential), and the second a time record of stimulus and responses of some task performed during the recording.

The system does the following:

1) Translates the analog data into a digital record on LINC-tape in a standard format; 2) Reads the digitized data from LINCtape and forms a raster, histogram and neural response display; 3) Outputs the data via a printout or by some suitable photographic setup.

The unique feature of this system is the ability to easily correlate spike activity not only with the stimulus but also with the response. The system is self-contained and may be loaded from the switches or from "DIAL." It requires an 8K PDP-12 with a KW12 clock, A-D channels, and two LINCtape transports. An "Interface" box will also be needed to monitor and control the two input channels from the tape recorder. The digitizing process is run separately from the analysis program, and other programs are available to catalog and label the data.

The system requires no programming experience to use, but some acquaintance with the PDP-12 will be necessary.

The system has its own Monitor/Loader which is loaded from the switches or which may be loaded from LAP6-DIAL by (LF) NAP,O (CR). The Monitor/Loader presents the "menu" of programs which are then loaded and started by use of the keyboard. The binaries cannot be loaded independently by the DIAL loader as they have no header block.

DECUS NO. 12-165 (Continued)

A system for generating two analog tape channels which the system digitizes is necessary. The digitizing resolution is 1 msec, whereas the final displays only show a 2 msec resolution.

Source Language: LAP6-DIAL

DECUS NO. 12-166

OS8-VC12 Display Device Handler for the PDP-12

Gotz Romahn, Heinrich Hertz Institut, Berlin, Germany

The VC12 handler is a two-page output device handler for the PDP-12 display. It conforms to all OS/8 device handler standards, especially check for CTRL/C as a monitor call, error exit, when trying to read with the display and normal exit if zero pages of text are specified to be transferred. Advancing through the output file is done by typing any key on the teletype (except CTRL/C).

Minimum Hardware: OS/8, VC12 Display Controller
Other Programs Needed: OS/8 BUILD
Storage Requirement: 2 pages
Source Language: PAL-8

DECUS NO. 12-167

FOCAL Patches

P. C. Diegenbach, University of Amsterdam, Amsterdam, Holland

Eight FNEW, FX and FZ subroutines for FOCAL-12. Some may also be used under FOCAL '69. Their purposes are to use the Tektronix display terminal 4010 (8 and 12), to use a second teletype-like device (8 and 12), to type out an integer as consisting of two characters (8 and 12), to read in specified DIAL programs (12), and to read in the DIAL monitor (12).

Other Programs Needed: FOCAL-12 (or FOCAL '69)
Storage Requirement: 2K
Source Language: DIAL (PAL)

DECUS NO. 12-168

Spectral Analysis System

Frieda Roos and Noel Flemming
Submitted by: T. Joe Willey, Ph.D., Loma Linda University, Loma Linda, California

The Spectral Analysis System is a series of programs developed for processing EEG data. To facilitate transitions from one to another, the programs have been placed in an executive. The system is designed to handle one channel at a time to allow for more flexibility. However, data from several channels can be digitized simultaneously and then separated into single channels for the analysis. This set of programs was developed for a particular environment, but could be applicable to a wide variety of settings. The system consists of the following programs:

DIGITIZE: Converts up to 16 channels of analog input signal to digital data stored in LINCtape with no gaps in real time.

DATA UNSCRAMBLER: Unscrambles interleaved data from up to four channels stored by DIGITIZE.

WILD POINT EDITOR: Checks digital data for possible artifacts by finding points of large amplitude. The editor has several editing options.

FFT POWER SPECTRA: Computes power spectra by the sum of the squares of FFT coefficients and stores 64 components per spectrum on LINCtape. Also the program creates a format block. It uses DECUS 8-143 as the computing kernel.

FORMATTER: Accepts alphanumeric identification of data and control parameters to be used by AUTOMATIC PLOTTER.

AUTOMATIC PLOTTER: Plots serial FFT spectra using hidden line suppression methods from data stored on LINCtape according to format control parameters. Alphanumeric identification is plotted with the group. This program can bootstrap from one format block to the next for continuing operations.

FREQUENCY BAND PLOT: Computes and plots averages and standard deviations for a specified frequency band from spectra stored on LINCtape and displays them sequentially. The band plot can be plotted or typed out; alphanumeric identification is included with the output.

SPY: Moving window display of data on tape (modified from DECUS No. 12-57).

Minimum Hardware: PDP-12 with 8K core, VR12 display and 2 LINC transports; KE12 extended arithmetic element; AD12 A/D converters, 8 channels; ASR33 teletype or equivalent; CALCOMP plotter or equivalent
Source Language: LAP6-DIAL-MS

DECUS NO. 12-169

HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12

Stephen C. Woods, John T. Williams, Eric Halgren, Thomas L. Babb; UCLA Center for Health Sciences, Los Angeles, California

HSTPLT is a multi-option program for cross-correlating two STAP-12 compatible event trains. When one train is designated as a reference train, various long or short pre- and post-reference times may be selected and all or only certain reference events may be selected for computation. The computed histogram with calibrations for time and numbers of events may be plotted and simultaneously individual bin counts may be printed.

DECUS NO. 12-169 (Continued)

Minimum Hardware:	PS/8, OS/8 or OS/12 Operating System, LINCtape or other mass storage device, EAE
Other Programs Needed:	QANDA modified
Storage Requirement:	8K
Restrictions:	Not restartable
Source Language:	PAL-12 or PAL-8

DECUS NO. 12-170

INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12

Stephen C. Woods, Eric Halgren, Thomas L. Babb
Submitted by: Thomas L. Babb, UCLA Center for Health Sciences, Los Angeles, California

INPUT reads and stores trains of data. STAT performs a variety of statistical tests upon these trains (X^2, RUNS, KOLMOGOROX-SMIRNOV, MANN-WHITNEY U, t- test). DIST finds the probabilities associated with some of the values given by these tests. One application of these programs is the nonparametric statistical analyses of histograms derived from neuronal spike trains, a form of point process data.

Minimum Hardware:	OS/8 or OS/12; LINCtape or other mass storage
Other Programs Needed:	FORTRAN IV (RPTS)
Storage Requirement:	8K, 12K for STAT2

DECUS NO. 12-171

Three Patches to the Clinical Lab-12 System

Mark J. Hyde, Upstate Medical Center, Syracuse, NY

1. AUTOTIME gives RE the ability to read the time of day maintained by the Monitor, thus simplifying the entry of requisitions.

2. RWARDP causes RE to print the ward along with the name in the verification line, thus providing for better patient identification.

3. WWARDP causes WO to print the ward next to the patient name on worksheets printed for workstations.

Minimum Hardware:	Clinical Lab-12
Other Programs Needed:	LAP6-DIAL-MS
Source Language:	LAP6-DIAL

DECUS NO. 12-172

WVU Utility Package

C. G. Roby, Jr., D. J. Duffy, J. A. Donnely, et al
Submitted by: T. W. McIntyre, WVU Medical Center, Morgantown, West Virginia

DX - Displays the OS/12 index similarly to DIAL's DX command. Will also print the index with an identification which is also displayed and may be changed.

IOPACK - Modifications to PIP's I/O package to simplify calling and using.

MAP - An improved bit map program which will print map, reverse map, ranges or reverse ranges.

LIST - A paged pretty lister, Lists, LS files, documents or forms with variable tabs, titles, etc. Also lists name of file in large block letters.

MARK12 - Trivial modifications to MARK12 to mark 128 word blocks with the P option and return to OS/12.

TTYLPT - A two page handler that simulates the line printer on the teletype.

PLT - A two page handler that accepts decimal ASCII input and plots on a standard XY plotter with retransmitting slide-wire or null detector. Uses relay and D-A converters.

IBM - Converts OS/12 ASCII files from any input device to EBCDIC files on Magtape (TU1Ø). Also converts in the reverse direction and has an option for forms control to FORTRAN.

PSDIAL - A quick and dirty converter for OS/12 to DIAL compatible files. Writes on LINCtape starting at block Ø of Unit 1.

Minimum Hardware:	OS/8, OS/12 System; VR14 or other display, X-Y plotter, D-A Converters, LINCtape, A-D Converters, Relays, TU-10
Other Programs Needed:	OS/8, PAL-12
Source Language:	PAL-12

DECUS NO. 12-173

SCOPEFOCAL

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

SCOPEFOCAL is 4K FOCAL, 1969 (DEC-08-AJAE) patched to allow use of the PDP-12 scope. To circumvent the problem of FOCAL not being fast enough to refresh the display, all points are displayed from a buffer.

Minimum Hardware:	PDP-12, TTY, VC12, VR12/14
Source Language:	LAP6-DIAL

DECUS NO. 12-174

CLOCK: Digital Clock with Westminster Chimes

Michael F. Lubozynski, Vanderbilt Medical School, Nashville, Tennessee

This is a software digital clock written for a PDP-12 with the extended arithmetic element (EAE). It displays the current time, counting the line frequency on the KW12 clock control input 1, and chimes on the quarter hour. The chimes are completely modifiable and consist of a series of musical notes played on the computer speaker. The "clock" also chimes the hours.

Source Language: DIAL

DECUS NO. 12-175

PLOTZER

Klaus E. Liebold, National Institute of Mental Health, St. Elizabeth's Hospital, Washington, D. C.

A collection of programs written in FOCAL to plot point by point graphs on the Calcomp 565 plotter, label them, plot histograms, and percentage distributions.

Minimum Hardware: PDP-12 and Calcomp 565
Storage Requirement: 8K
Source Language: FOCAL-12

DECUS NO. 12-176

FOCAL-12 Overlay to Access the DF 32 Disk

University Observatory, Vienna, Austria

Access is provided to the DF 32 disk from FOCAL-12 via the FZ user function. There are two files: a 2K integer file and a 1K floating point file.

The programs are offered on DIAL-readable paper tape (source).

Minimum Hardware: PDP-12, DF32 random access disk
Other Programs Needed: FOCAL-12
Storage Requirement: 8K
Source Language: DIAL

DECUS NO. 12-177

TENNIS

Lewis Brenner, Philadelphia Police Department Chemical Laboratory, Philadelphia, Pennsylvania

The game of tennis is played on the PDP-12 computer using the VR14 display scope. The rackets are controlled by A/D knobs Ø and 4 (left paddle) and 3 and 7 (right paddle). SSWØ, when set, generates a ball from the center net. SSW5, when set, returns to the DIAL monitor on tape unit Ø. The teletype bell rings when a player scores.

Minimum Hardware: PDP-12, VR-14 display scope
Other Programs Needed: DIAL System
Storage Requirement: Less than 2K
Source Language: DIAL

DECUS NO. 12-178

NUFOCAL, Modified FOCAL-12

William E. Hatcher, Veteran's Administration Center, Temple, Texas

This program is a patch to FOCAL-12 which allows the user to specify an output device which is unsuitable for output of an error message. A line printer not easily seen from the teletype might be such a device. If an error occurs when output is to the specified device, output will be restored to the teletype.

Minimum Hardware: 8K PDP-12
Other Programs Needed: DIAL Operating System
Source Language: PAL

DECUS NO. 12-179

The Mann-Whitney U Test

Klaus E. Liebold, National Institute of Mental Health, St. Elizabeth's Hospital, Washington, D. C.

These three programs written in FOCAL-12 will perform the nonparametric Mann-Whitney U Test. For samples in which N2 is larger than 20, a Z-value will be calculated and the correction for ties applied to the sampling distribution of U. Theoretically there is no limit to the number of scores which can be analyzed.

Minimum Hardware: PDP-12, VR12 scope, TU56 tape drive
Storage Requirement: 8K
Restrictions: Extended functions must be deleted
Source Language: FOCAL

DECUS NO. 12-180

CARDDIAL - Input to the DIAL Editor Via Cards

James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

CARDDIAL is a program which makes card input acceptable to the DIAL editor.

Minimum Hardware:	PDP-12, Card Reader, LINCtape
Other Programs Needed:	PAL-12A Assembler
Storage Requirement:	ØØØØ - ØØ777
Restrictions:	Same as for the DIAL Editor
Source Language:	PAL-12A

DECUS NO. 12-181

ATSXL - Text Display and Timing Routine for FOCAL-RT

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

ATSXL is an overlay to FOCAL-RT (DECUS 12—80) which allows a 'frame' of text to be presented on the display and the subjects response, response time and keydown time to be recorded. Up to 511 frames of up to 510 characters each may be randomly presented allowing adaptive techniques to be employed. Once the stored frame has been found display presentation is immediate. Up to 12 bits of response information can be recorded and timing is to an accuracy of 10 milliseconds. Responses are input on the external sense lines.

Minimum Hardware:	8K PDP-12 with dual LINCtapes, VR14 display, KW12A real-time clock and sense lines
Other Programs Needed:	FOCAL-RT (DECUS 12— 80) (On tape offered)
Source Language:	DIAL

DECUS NO. 12-182

KLK - A Simple Clock Overlay for PDP-12 FOCAL

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

A simple overlay of great use in elapsed time measurement which takes advantage of the ability of the KW12A clock to be stopped by an external event on any of the three clock trigger input channels. The routine assumes control of the clock and sets it counting from zero. An external event stops the clock and records which of the three possible events was present. The clock time and event code can then be read into the user's program at his leisure.

Minimum Hardware:	8K PDP-12, dual LINCtapes, KW12A, VR14
Other Programs Needed:	FOCAL-RT (DECUS 12-80) (On tape offered)
Source Language:	DIAL

DECUS NO. 12-183

DECIO - FOCAL-12 Whole Word Digital I/O Overlay

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

An alternative to the practice of accessing external sense lines and relays at the individual bit level, it treats the sense lines as a 12 bit integer and the relays as a 6 bit integer. The status of the 12 bits can then be read as a decimal number between Ø and 4Ø95 and the relays controlled by outputting a decimal number between Ø and 63. Any combination of bits may then be controlled by these integers. An input pattern can be decoded to give individual bits and an output pattern set up using the decimal equivalents of the bit pattern.

Minimum Hardware:	8K PDP-12, dual LINCtapes, KW12A, VR14
Source Language:	DIAL

DECUS NO. 12-184

PPSH - Neuronal Autocorrelation and Crosscorrelation Analysis Programs (Pre-Post Stimulus Histogram)

Ramesh R. Parekh, M.S.I.E. and Hardress J. Waller, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

PPSH (Pre/Post Stimulus Histogram) is a group of programs that, together, compute the autocorrelation and crosscorrelation functions for two concurrent sequences of events (e.g., two simultaneously recorded neuron spike trains or one spike train and one stimulus series). PPSHDATA compiles the intervals in real time as a single mixed and labeled, double precision list of indefinite length. Intervals are numbered sequentially and stored, along with relevant identifying data, on a Linc Tape train file.

PPSH1 reads a selected interval list and generates either a first order interval distribution or an n order correlation (expectation density) function. The histogram is displayed and may be plotted along with a calibrated scale. Total event counts and histogram areas are typed out as octal numbers.

HISTDUMP temporarily saves the histogram in a reserved four block section of Linc Tape on unit Ø for subsequent printout by TAPEDUMP (DECUS 12-2).

Minimum Hardware:	PDP-12 with 8K core, VR-12 display and dual Linctape; KW12A real time clock; KE-12 Extended Arithmetic Element; ASR33 Teletype or equivalent; Incremental plotter (optional)
Source Language:	LAP6-DIAL

DECUS NO. 12-185

Horoscope Casting Routines - Astrodynamical Subroutines

David L. Hindman, University of Texas Phonetics Laboratory and ARBEC, Inc., Austin, Texas

A collection of FORTRAN II subroutines which perform the astrodynamical, calendrical, and geographic computations made in the process of casting horoscopes. Primary components are: an ephemeris routine, a calendrical routine, and a routine to perform house setups.

The routines are not warranted and are to be used for fun only.

Other Programs Needed:	FORTRAN Compiler
Storage Requirement:	16K
Restrictions:	Will not cast horoscopes for latitudes greater than 66 degrees North or South
Source Language:	FORTRAN II

DECUS NO. 12-186

COBRA Assembler for the PDP-12

David L. Hindman, University of Texas Phonetics Laboratory and ARBEC, Inc., Austin, Texas

COBRA is a macro assembler for PDP-12s having at least 16K of core and the EAE. COBRA runs under PS/8 and produces binary output compatible with ASBLDR. The user may maintain system macro text in a file called SYSLIB and may also keep other text libraries. Other COBRA facilities are: qualified symbols, text parameterization, LMODE/PMODE assembly, and a DIAL simulation mode. A library of PS/8 linkage macros is included.

COBRA is configured for a system with a Centronics line printer, but is largely compatible with teletype output systems.

Minimum Hardware:	EAE and disk recommended
Restrictions:	Known defect in symbol table routine (symbol type not tested properly). Source text does not include form feed codes
Source Language:	COBRA

DECUS NO. 12-187

OS/8 Device Handlers for PDP-12 Core

James E. Randall, Indiana University, Bloomington, Indiana

These system and non-system device handlers are designed for a PDP-12 with Linctape as the mass storage device and with 32K of core. The handlers can reduce tape shuffling by keeping directories, systems area, or files in upper core. The handlers, their listings, and initialization and restoration routines are supplied on a Linctape which can be started from the console bootstrap. Full documentation is obtained in the file HOW.DC on the tape. The tape is OS/8 Version 3 and will not support earlier versions.

Storage Requirement:	32K
Source Language:	PAL-8

DECUS NO. 12-188

4K DISK/LINCTAPE MONITOR

Mark J. Hyde, 209 Ardsley Drive, DeWitt, New York

The 4K Linctape monitor is the disk/DECtape monitor with patches to allow it to use TC12 Linctape. The documentation contains many patches which are also of use to PDP-8 users of the disk/DECtape.

Minimum Hardware:	PDP-12, TTY, any disk or Linctape
Storage Requirement:	4K
Source Language:	PAL-D

DECUS NO. 12-189

DECtape Reader Handler for PDP-12

Gotz Romahn, Heinrich Hertz Institut, Berlin, Germany

This handler allows direct reading of DECtapes via the TC12F option. All OS/8 - V3 programs may be used.

Minimum Hardware:	PDP-12 with TC12F option and EAE
Other Programs Needed:	OS/8 BUILD
Restrictions:	Possibly will not run on a very slow PDP-12 and a very fast tape drive
Source Language:	PAL-8

DECUS NO. 12-190

PDP-12 Functions for OS/8 BASIC

Edward M. Schmidt, Laboratory of Neural Control, National Institute of Neurological Diseases and Stroke, National Institutes of Health, Bethesda, Maryland

This program contains 16 functions for the operation of OS/8 BASIC on a PDP-12. The functions include the clock, analog to digital conversion, sense lines, sense switches, relays, scope, digital input and output, and bit manipulation. The program constitutes the user function overlay provided for in OS/8 BASIC called BASIC.UF.

Minimum Hardware:	PDP-12, KW12 clock, Digital input and output registers (optional)
Other Programs Needed:	OS/8 BASIC
Storage Requirement:	5 octal pages
Source Language:	PAL-8

DECUS NO. 12-191

MTXIO - Multitasking Executive

S. R. Deller, M. Quinn, J. R. Raines (Documentation by F. J. Lewis); Northwestern University Medical School; Chicago, Illinois

MTX is a multitasking (real-time) executive for the PDP-12. It schedules tasks, performs A/D conversions and controls other I/O devices. No file structure is supported/imposed on mass storage devices by MTX itself and the MTX executive schedules core resident tasks only (see PSX subroutine). Analog to digital conversion is performed with a double-buffering technique to facilitate continuous sampling concurrent with processing of the signal. I/O device handlers may be added fairly easily. Currently supported are: teletype, LINCtape, DF32, KW12, DP12, DB12, AD12, Centronix Line Printer, and Ann Arbor Terminals

PSX is a subexecutive task which runs under MTX (actually 3 or 4 copies run as separate tasks). This task imposes the file structure on the mass storage devices, loads non-core resident programs into core when they are scheduled by MTX and provide a succinct subroutine call for core overlays from the mass storage devices. Utility programs which run under one copy of this subexecutive list LISTAPES; examine and modify core/disk/tape; print the PSX catalog; print DIAL tape catalogs and source programs; type core dumps; determine the number of processor cycles available at a new background priority level.

Minimum Hardware:	PDP-12, TTY, LINCtape, DF32, AD12, KW12A
Storage Requirement:	3K plus EAE
Miscellaneous:	Will handle more than 30 tasks; room for many additional device handlers
Source Language:	DUAL (DECUS 12-120)

DECUS NO. 12-192

ASFLO - Packed ASCII to Floating Point Format Conversion

Klaus E. Liebold, NIMH/IRP/SMR, St. Elizabeth's Hospital, Washington, D. C.

Numbers stored as packed ASCII characters (2 characters/word) will be converted to floating point format (1 number/3 words). Especially useful in conjunction with DCON-10 which translates a DEC-10 tape into a DIAL source file. This program can then be used to generate real numbers for a FOCAL-12 data file. Each complete ASCII character number must be terminated by a carriage return. The TC-12-F option is only necessary if DCON-10 or PRTC-12 is used.

Minimum Hardware:	PDP-12, TC-12F Option
Other Programs Needed:	DIAL-MS, DCON-10
Storage Requirement:	8K
Source Language:	LAP6-DIAL

DECUS NO. 12-193

A Set of FORTRAN Callable DF-32 Routines for the PDP-12

Rudolf Albrecht and Helmut Jenkner; University Observatory, Vienna, Austria

These routines differ from the usual OS/12 drivers in that a nonsystem DF32 handler is implemented so the disk can be addressed even if it is not the system device and without lengthy calls to the USR. Variable amounts of data (integer of floating point) up to 2K can be transferred to and from any place in core.

Minimum Hardware:	PDP-12, DF-32 disk(s)
Other Programs Needed:	OS/12
Storage Requirement:	256 (decimal)
Source Language:	SABR

DECUS NO. 12-194

Split Plot Factorial Analysis of Variance- %SPFAV

David J. Wyper, West of Scotland Health Boards, Glasgow, Scotland

%SPFAV is an analysis of variance program for data suitable for analysis by the split plot design. Two or more groups can be studied with two or more levels in each group and the number of subjects in each group need not be equal but must be greater than 1. The program computes the appropriate "t" and "F" ratios.

Monitor/Operating System:	FOCL-12K
Core Storage Required:	12K
Source Language:	FOCAL

DECUS NO. 12-195

TRIGSYS - A Multichannel Fast Point Process Data Acquisition

S. C. Woods, Dr. T. L. Babb, E. Halgren, A. W. Perga, Center for Health Sciences, University of California, Los Angeles, California

TRIGSYS consists of two programs, FASTTRIG and CONVERT. These programs are written for the PAL-12 assembler and must be assembled by that program.

FASTTRIG is an eleven channel digital input program for the PDP-12. It was written to replace the STAP-12 sub-program EVENT3, and was specifically designed to eliminate many of the restrictions found in that program. In particular: only 3 input channels, fixed sample rate, and a maximum of 2047 data points per run.

This program allows several sample rates, eleven input channels and a maximum of 520 K sample points per run.

DECUS NO. 12-195 (Continued)

CONVERT is the second half of TRIGSYS. It takes the output of FASTTRIG and produces STAP-12 compatible data trains on a 256 word blocksize LINCtape containing a STAP-12 directory.

Monitor /Operating System:	OS/8 - OS/12
Core Storage Required:	8K
Hardware Required:	One mass storage device, EAE, 12-bit Digital Input (DI-12), one LINCtape
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	Cannot use LINC system device handler (or any co-resident handler)

DECUS NO 12-196

TRALIB - Point Process Data Library and Editor

Stephen C. Woods and Thomas L. Babb, Center for Health Sciences, University of California, Los Angeles, California

TRALIB is a combination of two programs: 1) GARBAGE-MAN, which allows the user to edit event trains which might contain sequences of events with known errors. STAP-12 compatible event trains may be modified automatically by a selectable pseudo-low-pass filter or manually for specified events in the train. 2) INDEX, which is a printer program for the STAP-12 AIB (Additional Information Blocks). It formats STAP-12 compatible output (with space for tabs and ignoring control characters) and prints (after all the AIBs) the number of free trains and free blocks (896 is the assumed maximum).

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	1 LINCtape, one other mass storage device, EAE
Other Software Required:	SUPRQA (DECUS 12-197)
Source Language:	PAL-12

DECUS NO. 12-197

SUPRQA - Super QANDA

Al Perga and Stephen C. Woods, Brain Research Institute, University of California, Los Angeles, California

SUPRQA is a modification of QANDA (DECUS 12-56) with the following new features:

1) Waits for the TTY flag before typing; 2) doesn't display a space before answer; 3) doesn't initialize answer buffers; 4) takes line feed exit with C(AC)-7777 on CTRL C.

Entry point and refresh point are unchanged.

Core Storage Required:	512 (5000-5777)
Hardware Required:	TTY, VR12
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	TTY flag must be set before entry

DECUS NO. 12-198

BURST, V2 - A Point Process High Pass Filter

Stephen C. Woods, John T. Williams, Dr. Thomas L. Babb, Center for the Health Sciences, University of California, Los Angeles, California

BURST V2 is a STAP-12 (1) compatible point-process 'BURST' detection program.

This progam is a merged and rewritten version of DECUS 12-139(2) with some major modifications. These modifications are:

1) The three separate sections of BURST (BRSTRAIN, BRSTEDIT, and BRSTPRNT) have been combined into one easy to use module.

2) The program is now OS/8 compatible and in fact uses the OS/8 device independent I/O capability.

3) Variable detection window size and time.

4) Variable printing resolution.

Monitor/Operating System:	OS/8 or OS/12
Core Storage Required:	8K
Hardware Required:	LINCtape, mass storage (RK01, PF32, etc), EAE, printer or TTY
Other Software Required:	STAP-12 (DECUS 12-34) or TRIGSYS (DECUS 12-195)
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	Input must be STAP-12 format, not limited to 2048 events

DECUS NO. 12-199

CPRINT. SB: Utility Subroutines for a Centronics 101A Printer

Helmut Jenkner
University- Observatory
Vienna, Austria

Special features of a Centronics Model 101A Printer, such as elongated character mode, bell, line feed, vertical tabs, form feed, delete, programm-controllable select and deselect, are enabled by a package of eight simple FORTRAN - or SABR- callable subroutines. These routines should work in any OS/8 or OS/12 environment using the appropriate line printer.

Monitor/Operating System:	OS/8, OS/12
Core Storage Required:	128 words
Hardware Required:	Centronics Model 101 A Printer
Other Software Required:	SABR
Source Language	SABR

DECUS NO. 12-200

MULT-PS2 Multiple Printing Source Program

Bruce L. Hillsberg
Jamesville-DeWitt Central Schools, DeWitt, New York

MULT-PS2 allows the user to "batch" print as many sources as he wants. Input is on mark sense cards and output is on either the system teletype or line-printer.

Monitor/Operating System:	LAP6- DIAL
Core Storage Required:	8 PDP-8 pages
Hardware Required:	PDP-12, 2 Linctape Drives, Mark Sense Card Reader, LPT or TTY
Other Software Required:	PAL-12A (DECUS 12-77), DIAL
Source Language:	PAL-12A
Problems, Deficiencies, Restrictions:	Must have DIAL, will not print tabs

DECUS NO. 12-201

DPSPV3: Double Precision to Single Precision Integer Converter

Barry L. Johnson, Ph.D.
National Institute for Occupational Safety and Health, Cincinnati, Ohio

Program DPSPV3 is an extension of DEC's SINPRE program (DEC-12-UW4A-D) and is used to convert Linctape-based double precision files into Linctape-based single precision files. DPSPV3 will run under OS/8 and contains sense switch options for the PDP-12 that permit: 1) looping of the conversion routine, 2) choice of 8 or 11 bit conversion, 3) choice of double precision data format, i.e. high/low or low/high, 4) saving of the scale factor generated when scaling double precision data to single precision data. The program has been used extensively on double precision data tapes from signal averaging programs and spectral analysis programs in order to generate single precision tape files acceptable to FORTRAN II data analysis programs.

Monitor/Operating System:	OS/8
Core Storage Required:	4K
Hardware Required	PDP-12, VR14, LINC tapes
Other Software Required:	SINPRE (DEC-12 UW4A-D)
Source Language	PAL 12

DECUS NO. 12-202

PLOT8CH: 3-Dimensional Plotting of EEG Data

Thomas W. Horn
Ohio Mental Health and Mental Retardation Research Center, Cleveland, Ohio

This program combines FETCHFFT (DECUS 12-63) and PLOT3D (DECUS 12-43) and has been modified to plot 8 channels of transformed EEG data stored in double precision on LINC tape. Up to 4 channels may be plotted at a time across one page of plotter paper. Previous data is not overwritten resulting in a 3-dimensional effect. Upon completion of the first 4 channels the paper automatically advances one page and the program retrieves and displays the first blocks of the next series of channels (up to 4).

Core Storage Required:	8K
Hardware Required:	Complot Incremental Plotter, TU56
Other Software Required:	OLFFT1 or equivalent
Source Language:	LAP6 DIAL

DECUS NO. 8-373

LISP Disk Array

Gary Coleman, Case-Western Reserve University, Cleveland, Ohio

This program allows the user to store up to 4096 individual numbers on disk. Storage is by a one-dimensional array. The function is accessed by EXPR. Both the READ and WRITE routines sit in the top of core, just under the monitor, and occupy only 26_{10} locations (13 LISP cells). The function is similar to FOCAL'S FNEW for disk.

Minimum Hardware: PDP-8 with 1 DF32 Disk
Other Programs Needed: LISP Interpreter for the PDP-8 (DECUS NO. 8-102a)
Source Language: PAL-D

DECUS NO. 8-374

Binary or RIM Consolidator

Garth Peterson, South Dakota School of Mines and Technology, Rapid City, South Dakota

The Binary or RIM Consolidator program accepts input paper tapes in either binary or RIM format and punches them back out in binary format, in RIM format, or in a special RIM format compatible with the binary loader. Multiple input tapes, not necessarily all in the same format, may be combined into one output tape. Format conversions between binary and RIM may be made in either direction. The interrupt facility is used for efficiency.

Other Programs Needed: 0-777
Source Language: PAL-D

DECUS NO. 8-375A

3 Page Floating Point Package

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This package makes available an alternative to the lengthy floating point package distributed by DEC and also utilizes the concept of cutting down exponent size to allow a larger mantissa. It uses 3 word numbers, with 27 bit mantissa and 8 bit exponent.

Minimum Hardware: 4K PDP-8
Storage Requirement: Locations 50-64, 5410-6177
Source Language: PAL 1Ø, Version 141

DECUS NO. 8-375B

3 Page Floating Point Package with Floating Output

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This package is the same as the three page floating point package, except that a floating point output routine has been added.

Minimum Hardware: 4K PDP-8, ASR33
Storage Requirement: 50-64, 5400-6177 for arithmetic routines; 6200-6377, 6400-6501, 6566-6577 for floating output
Source Language: PAL 1Ø, Version 141

DECUS NO. 8-376A

Field 1 Symbol Table Storage for PALD (DEC-D8-ASAA-LA)

Peter F. Calder, Weapons Research Establishment, Adelaide, South Australia

Instead of storing external symbols on the system device (in .SYM), this modification allows Field 1 to be used for this purpose, reducing assembly and listing time by (typically) 50%. 20 blocks of external symbols are provided for.

Minimum Hardware: 8K PDP-8, Disk or DECtape
Other Programs Needed: PALD Assembler (DEC-D8-ASAA-LA)
Storage Requirement: Field Ø, same as PALD; Field 1, pages 1-20
Source Language: PAL

DECUS NO. 8-376B

Field 1 Symbol Table Storage for PALD (DEC-D8-ASAC-LA)

Peter F. Calder, Weapons Research Establishment, Adelaide, South Australia

This overlay is for the later version of PALD (DEC-D8-ASAC-LA). The operation of the updated version is identical to the original.

Minimum Hardware: 8K PDP-8, Disk or DECtape System
Other Programs Needed: PALD Assembler (DEC-D8-ASAC-LA)
Source Language: PAL

DECUS NO. 8-377

One Pass Assembler

Barney Hordos III, University of California, Lawrence Radiation Laboratory, Berkeley, California

This program is for on-line use with PDP-8 series computers with 4K or greater core. The assembly is made directly into the memory of the computer, and a paper tape in RIM or BIN format may be punched. The op code field length is limited to three characters with indirect addressing available. It is not Source language compatible with other PDP-8 assemblers.

Minimum Hardware: 4K PDP-8
Storage Requirement: 3000-7063
Restrictions: Can write over itself, not protected
Source Language: Not compatible with other PDP-8 assemblers

DECUS NO. 8-378

Map Directory Information on KV8/I

Elmer J. Bourque, RPC Electronics Department, New Brunswick Research and Productivity Council, Fredericton, New Brunswick, Canada

KV8Map gives the operator a complete picture of the TCØ1 DECtape Library System Directory including file name, starting block on tape, number of blocks in file, starting address of the program and a complete description of the core locations used by each file.

Minimum Hardware:	Teletype, TCØ1 with at least one TU55; KV8/I Display
Other Programs Needed:	TCØ1 DECtape Library System
Storage Requirement:	6ØØØ - 7577
Source Language:	PAL III

DECUS NO. 8-379a

Double Precision and Floating Point Interchanger

Stephen J. Freeland and F. Jakob, Sacramento State College, Sacramento, California

This is a subroutine for conversion of double precision to floating point format and vice-versa. A routine to move the radix point in a double precision number to any location is also included as a separate subroutine. The listing for these routines is not included with the write-up, but can be generated from the source tapes. However, a small program is included which was written to prove this version of the ROTATE subroutine

Minimum Hardware:	PDP-8
Other Programs Needed:	DEC Floating Point Package No. 1
Storage Requirement:	Location 170-175 and 5240 to 5576
Source Language:	PAL III

DECUS NO. 8-380

WATSNU

P. C. Halsall
Submitted by: L. A. Cragg, Teklogix Ltd., Mississauga, Ontario, Canada

WATSNU has two purposes: to compare current core store and a binary tape without changing core; and to reload a binary tape and illustrate locations which are changed in the process. It is used during debugging to highlight differences between current program status and the last binary program tape; and also in the event that a system failure requires a program reload in order to provide a trace of conditions at the time of failure.

Minimum Hardware:	4K PDP-8, ASR33, (high speed reader optional)
Storage Requirement:	1 page
Source Language:	MACRO-8

DECUS NO. 8-381

Cardreader Subroutine for Disk Editor

Herbert Steiger, Medical Institute fur Lufthygiene, Duesseldorf, Germany

The program allows for the use of a cardreader as input with the editor. The high speed reader is replaced by the cardreader. All other input and output equipment can be used without any changes.

After every card a CR is produced to end the line. The read-in is terminated by a CTRL/FORM, when 40 cards have been read. By doing this the overflow of the textbuffer is avoided and there is room for possible changes.

Minimum Hardware:	8K PDP-8/I, ASR33, DF32 RF08, TC01, TU55, CR8/I
Other Programs Needed:	Disk Monitor System, Disk Editor (DEC-D8-ESAB)
Storage Requirement:	214_8 locations in Field 1. Subroutine will be in Field 0 on input
Miscellaneous:	Can also be written for 4K
Source Language:	PAL-D

DECUS NO. 8-382

Readable High Speed Punch Copier

Nigel D. Chubbb, Collins Radio Company of United Kingdom, Limited, Hounslow, Middlesex, United Kingdom

This program accepts alphanumeric characters from teletype and outputs them in a readable form on a high speed punch. On depression of ALTMODE key, a copy is made of tape placed in high speed reader.

Minimum Hardware:	Basic PDP-8 with high speed reader and punch, ASR33
Storage Requirement:	3 pages +
Source Language:	PAL III

DECUS NO. 8-383A

Scan and Analysis Program

A. M. Romaya, University of Oxford, Department of Nuclear Physics, Oxford, United Kingdom

The program is an investigation of the possibility of using a graphic display for a highly efficient method of inputting graphic data. It is divided into two parts. The first part scans the graphic data set as rectangular shaped elements or routings on a transparency. A digitized image of the transparency is obtained and displayed. This image is then analyzed by the second part to obtain the desired symbols or routings.

Minimum Hardware:	Basic PDP-8 with 338 Display

DECUS NO. 8-383B

Core Display Program

A. M. Romaya, University of Oxford, Department of Physics, Oxford, United Kingdom

This program allows the user to display, change, dump and punch the contents of any core location by commands initiated from the 338 display light pen and push buttons. The program occupies locations 5ØØØ-734Ø of memory field one. The program does not set the push down pointer or the interrupt system and hence field Ø is absolutely free for use by other programs. It is possible to run this program concurrently with another which uses the interrupt system. (This second program should not use the display unless in special modified cases.)

Minimum Hardware: Basic PDP-8 with 338 Display

DECUS NO. 8-383C

Drawing Applications Program

A. M. Romaya, University of Oxford, Department of Physics, Oxford, United Kingdom

This program is intended to show the facilities the DEC-338 system offers when considered as a drawing board. It allows the user to: draw straight lines of "free hand" over a total of 75 X 75 inch area; include symbols which may be formed by means of the program; label the drawing in alphanumeric and other characters; delete items drawn; output the display and symbol files created and input a display file and its symbols for updating. The program incorporates a tracking cross and raster and the coordinates of the tracking are shown when required. Control is obtained by a set of light buttons and push buttons and the switch register.

The documentation gives possible core location changes for adapting the dimensions drawn to special cases if required.

Minimum Hardware: Basic PDP-8 with 338 Display

DECUS NO. 8-384

BLOK

T. D. M. Roberts, Institute of Physiology, University of Glasgow, Glasgow, Scotland

This is a two-page program used under Monitor for examining the state of the disk. Blocks are printed out on the teletype with their link words, either in Directory format with the file names decoded, or in an octal array format. The number of the block to be examined may be entered either from the SR or from the teletype using ODT.

Minimum Hardware:	PDP-8, ASR33, DF32
Other Programs Needed:	DEC Monitor System, ODT at 4000 (optional)
Storage Requirement:	6000-6377
Source Language:	PAL-D

DECUS NO. 8-385

Mixed ASCII Formatting and Outputting Technique

Donald L. Scanlon, Romelan Industries, Santa Clara, California

This technique provides a reasonably good tradeoff between storage requirements and execution time in real-time systems when a number of fixed and variable field messages must be output. The technique uses unpacked standard ASCII code for variable data and packed, modified ASCII for fixed data. The two formats may be mixed and are easily detected and processed by an interrupt routine.

Source Language: PAL III

DECUS NO. 8-386

Multiple Field Loader

Randall S. Battat, 55 San Rafael Way, San Francisco, California

The Multiple Field Loader is used to load paper tapes punched in BIN format into more than one field of core memory. It will also change the field when program is running. It is useful when a very long program is encountered.

Minimum Hardware:	8K PDP-8
Storage Requirement:	106_8 locations
Source Language:	PAL III

DECUS NO. 8-387

Grade Point Correlation

E. D. Huthnance, Newberry College, Newberry, South Carolina

This package of programs calculates correlation matrices for p samplings of a real variable (e.g. student grade point ratios) with n Boolean variables (e.g. subjects taken). The programs can also correlate combinations of the n variables taken m at a time with the real variable. Included in the package are a versatile data tape editor which can be used to prepare an input data tape for the correlator and a program which converts the output of the correlator into percentage correlation matricies.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFC1-PB and DEC-08-AFC3-PB)
Source Language:	FORTRAN and PAL III

DECUS NO. 8-388

CALENDAR

R. Lee, University of Kent at Canterbury, Canterbury, Kent, England

This program will print the calendar for any year between 1

DECUS NO. 8-388 (Continued)

A.D. and 9999 A.D. inclusive. The Julian calendar is used before 1752 and the Gregorian calendar after 1752. Output is on the Teletype or high speed punch

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	20-60, 200-1537
Source Language:	PAL III

DECUS NO. 8-389

Mini-Monitor, A Secondary Disk Monitor for the PDP-8

R. S. Lewis, Science Research Council, Rutherford Laboratory, Chilton, Didcot, Berkshire, England

The program allows large numbers of core images to be saved on disk by name, but independent of the DEC Monitor. The restrictions normally imposed by the limit on the number of file names available are thus avoided.

Minimum Hardware:	4K PDP-8, DF32 Disk
Other Programs Needed:	DEC Monitor SYSIO Head
Storage Requirement:	3 contiguous pages of core
Restrictions:	Only contiguous saves available. No swapping-out of core
Source Language:	PAL-D

DECUS NO. 8-390

PALEDCO (PAL Assembler and Editor Combined)

Paul Fingerman, Department of Psychology, State University of New York at Stony Brook, Stony Brook, New York

PALEDCO is a combined editor and assembler, based on Symbolic Editor (DEC-Ø8-ESAB-PB) and PAL III Assembler (DEC-Ø8-ASB1-PB). It allows the user with an 8K machine to enter PAL III language programs on-line using the editor, edit them, and then to assemble them from the text image in core, without the intervening paper tape step previously required. If an error diagnostic should occur during assembly, he has immediate access to the editor and his incorrect text, so that "instant" editing and reassembly is possible. "Instant" editing and higher assembly speed are the two primary advantages of this system over existing ones. In addition, the editor's text storage area has been expanded by 1Ø3Ø (octal) locations. Finally, all editor and assembler options which were available in the DEC programs have been retained, and Bin loader in lower core is not destroyed, advantages over earlier programs of this sort.

Minimum Hardware:	8K PDP-8, ASR33 (High Speed Reader and Punch optional)
Other Programs Needed:	BIN Loader
Source Language:	PAL III

DECUS NO. 8-391a

7 or 9-Track MTA for PS/8 with TC58/TU-20

Roger Seeman, The Boeing Company, Seattle, Washington

This is a revision and correction of the original program written by John Alderman. It is a single unit Magtape handler for use with the PS/8 system. Each tape must be formatted (see DECUS NO. FOCAL8-125a) before use. Tapes will have a directory and otherwise resemble DECtape in storage operations. REWIND is invoked when directory block is searched for.

Minimum Hardware:	PS/8 system configuration with Magtape
Storage Requirement:	1 page
Source Language:	PAL 8

DECUS NO. 8-392

Vector-8

Richard Rothman, Groton School, Groton, Massachusetts

Vector-8, a new programming language, is designed to allow the user of a PDP-8 with 8K and a DF32 Disk to take full advantage of the hardware. It offers 33 functions, 15 operators and 22 commands.

Minimum Hardware:	8K PDP-8, DF32 Disk
Source Language:	PAL-1Ø

DECUS NO. 8-393

Queing TCØ1/TU55 DECtape Routines

James Crapuchettes, Stanford Electronics Labs, Stanford, California

These routines, which are a much modified version of DEC-08-FUBO (previously DEC-08-31U) provide the user with the ability to read and write 128 words (one memory page) from/onto standard 129 word DECtape blocks. Successive blocks are transferred into/from successive 128 word areas of memory. The routines will transfer into/from any memory field, will begin searching in either forward or reverse direction for the block at which the transfer will begin, and will queue one read/write request to keep the DECtape in motion (and transferring data) as continuously as possible.

Minimum Hardware:	PDP-8, TC01 DECtape control and TU55 DECtape transport(s)
Storage Requirement:	About 1 1/4 pages of memory (240_8 locations)
Source Language:	PAL III

DECUS NO. 8-394

BASIC MOO

Guy Steele, Jr., Brighton, Massachusetts

MOO is a game of deductive strategy which is complex enough to challenge expert logicians, yet simple enough for a fourth-grader to learn. MOO also improves the deductive faculties of the player, and is recommended for use in schools.

Minimum Hardware:	Any standard BASIC system; computer or teletype
Other Programs Needed:	BASIC
Source Language:	BASIC

DECUS NO. 8-395

Space War

Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

The classic game of Intergalactic Death and Destruction on a LAB-8. Two players vie with ships in space for control of the Universe. The ships may be controlled from the Switch Register or from the AXØ8 front panel Blue Ribbon Connector.

Minimum Hardware:	4K LAB-8 or LAB-8/L, ASR33
Storage Requirement:	25ØØ words
Source Language:	PAL

DECUS NO. 8-396

MTS-6/70 (Millisecond Time-Sharing System)

Charles W. Snyder, Department of Psychology, University of Notre Dame, Notre Dame, Indiana

A laboratory time-sharing system for data processing and control of up to 18 experiments without interaction. Experiment programs in PAL III are called at 1, 10 or 100 Hz for one millisecond per share. Inputs may be sampled at 1000 Hz. The basic system of about 1400 core words includes a scope interactive display, I/O, arithmetic, conversion, keyboard control, and service routines most useful in behavioral research.

Minimum Hardware:	4K PDP-8/I, ASR33, AXØ8 with scope, XR, XM, XC options to 16 analog channels (LAB-8 system), PCØ8 High Speed Reader and Punch
Storage Requirement:	11_{10} pages: Ø2ØØ-Ø377, 52ØØ-7611, plus half of Page Ø
Restrictions:	Experiment programs are not on interrupt and must return within 1 msec.
Source Language:	PAL III

DECUS NO. 8-397

8K Editor

Bill Donelson, The Choate School, Wallingford, Connecticut

This editor was designed to be used with a DF32, but can be used without it as explained in the documentation. The editor contains 30 commands, many of which can use multi-letter search strings. I/O for disk has been greatly improved (Input and Output filenames may be the same !) and Reader/Punch are always enabled. (High Speed)

Minimum Hardware:	8K PDP-8; DF32 and high speed paper tape recommended
Other Programs Needed:	"AF" version of Disk Monitor if Disk I/O is used
Storage Requirement:	[Ø-3777] field Ø (20_8 blocks on disk)
Restrictions:	Will not run with 2 disks. Does not recognize second SAM block
Source Language:	PAL-D

DECUS NO. 8-398

IMAGE

John Alderman, Applied Data Research, Atlanta, Georgia

IMAGE, a program to convert PS/8 'SAVE'd files to binary format, translates a SAVEd file and produces a binary output file, which may then be reloaded using any of the binary loaders of the PDP-8 family. It is useful when the only copy of a working program is on a saved file, or for transmission via paper tape to other installations.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	2000-4400; 16600-17577; 2000-6003
Source Language:	PAL-8

DECUS NO. 8-399

8K FORTRAN Bit Manipulation Subroutines

Michael J. Allen, Lawrence Radiation Laboratory, Livermore, California

Two closed subroutines which may be used by the FORTRAN programmer for bit manipulations. One page of core and EAE are required by each subroutine.

LBYT function subroutine will load a byte of any size into the processor AC, right-adjusted.

SBYT subroutine will insert a byte of any size into a specified integer.

Minimum Hardware:	8K PDP-8, EAE
Source Language:	SABR

DECUS NO. 8-400a

Execute Slow

Gary G. Barrett, General Motors Styling Staff, Warren, Michigan
Revised by: G. A. Moyle, University of New South Wales, Australia

Execute Slow will execute the user's program one instruction at a time. Before the instruction is executed the LINK, ACCUMULATOR, PROGRAM COUNTER and INSTRUCTION are printed on the ASR33. The program only occupies one page and differs from most trace programs in that user instructions are actually executed from the user's original location. Subroutine tracing can be turned off.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	Locations 0000 through 0003 in field zero and 6600-6777 (1 page) in any field
Restrictions:	User interrupts may not be used and the 6002 instruction not allowed. Instructions with an effective address of .-1 may cause incorrect execution of traced program
Source Language:	MACRO-8

DECUS NO. 8-401

Dice Game and TIC-TAC-TOE

Lyle Kline, Inglemoor High School, Bethell, Washington

Dice Game simulates a craps table and allows one player to make fictitious bets and roll the dice. Full playing instructions are given by the program when it is run on-line with the BASIC Compiler.

Tic-Tac-Toe is an excellent demonstration program. It is possible to beat the computer for once.

Other Programs Needed: BASIC Compiler
Source Language: BASIC

DECUS NO. 8-402

Resequence

Howard Wolfington, Department of Defense Computer Institute, Washington Navy Yard, Washington, D. C.
Submitted by: W. Kieswetter, Digital Equipment Corporation, Washington, D. C.

This routine will resequence line numbers (and references) within a BASIC program on the TSS-8.

Minimum Hardware: TSS-8
Other Programs Needed: BASIC Compiler
Storage Requirement: 0-4K
Source Language: PAL-D

DECUS NO. 8-403

Stereo - A 2 Channel Music Program

Maurice Retter, University of Oxford, Oxford, England

A musical program, written for the PDP-8, which can control two loudspeakers independently. A frequency is produced by creating a square wave pulse train, where each pulse is generated by an IOT instruction, and the time delay between pulses is under program control. Two channels are made available, if required, by using two IOP pulses from one IOT instruction to activate independent loudspeakers. The program is divided into a coding section, and a decoding section and play routine.

Minimum Hardware: 4K PDP-8, two R3Ø2's, two amplifiers and speakers
Source Language: PAL III

DECUS NO. 8-404

Octal MEM Dump - Extended Memory

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

This program's major objective is similar to Digital-8-6-U, to dump memory contents on the teletype. Included or revised are: 1) a CDF instruction; 2) heading routine; 3) ten spaces tab routine and 4) each line begins with an absolute address followed by the first eight words. This process repeats until block is exhausted.

Minimum Hardware: 4K PDP-8, Extended Memory, ASR33
Source Language: PAL III

DECUS NO. 8-405

SOOT

S. de Vries and C. C. Westphal, Royal Dutch Blastfurnaces and Steelworks, Ymuiden, Holland

This program will execute PDP-8 programs under full operator control. SOOT is a debugger of the interpretive type. It can handle all instructions, including those for extended memory, with the exception of 2 word EAE instructions. It can also handle program interrupts.

Minimum Hardware: 4K PDP-8, ASR33
Storage Requirement: 4 pages
Source Language: PAL

DECUS NO. 8-406

STATPAC Revisions for PDP-8/I and TSS/8

Dartmouth College - Revisions by Berkshire Community College
Submitted by: Roger W. Strickland, Berkshire Community College, Pittsfield, Massachusetts

This package contains 11 programs from the original PDP-10 Dartmouth BASIC Statistical Package which have been revised for the PDP-8/I and TSS/8. The documentation consists of a description and listing of each of the programs. The DECtape which is available is a PDP-10 formatted symbolic tape.

Minimum Hardware: PDP-8/T
Other Programs Needed: BASIC
Restrictions: Array sizes very restricted for TSS/8 BASIC
Source Language: BASIC

DECUS NO. 8-407

Patch to Editor (DISK) DEC-D8-ESAD-PB

H. D. Schenk, Deutsche Forschungs-und Versuchsanstalt fur Luft und Raumfahrl, Flughafen, Germany

This patch corrects two errors found in EDIT-D Version ESAD. It allows the Editor to work with "Dn :name" as input or output device for the source file.

Minimum Hardware: 4K PDP-8, Disk or TCØ1
Other Programs Needed: EDIT-D DEC-D8-ESAD-PB
Source Language: PAL-D

DECUS NO. 8-408

Disk Utility Program

P. Galen Lenhert and Douglas Henry, Vanderbilt University, Nashville, Tennessee

Used for disk backups and file storage. All types of files (ASCII, USER, etc.) can be punched by entering the file name or disk block numbers. Files saved by name are restored to any free area on the disk. Program also lists the file directory and erases files. Checksums are provided. Program design and documentation should allow modification to use reader/punches and magnetic tape without great difficulty.

Minimum Hardware:	4K PDP-8, ASR33, one DF-32
Storage Requirement:	Program: 0-2177; Working storage: 3000-7577
Restrictions:	I/O Limited
Source Language:	PAL-D

DECUS NO. 8-409

Card Loader

Peter Barnett, Dubner Computer Systems, New York, New York

With this package, programs may be loaded into the computer from punched cards rather than from paper tape. This is especially convenient for computers not having a high speed paper tape reader. Two programs are provided. The first is a loader using the CR8/I card reader. The second converts binary programs to the proper format for use with the above.

Minimum Hardware:	PDP-8/I, CR8/I card reader
Storage Requirement:	80 core locations for loader, 4K for converter
Source Language:	PAL

DECUS NO. 8-410

Pseudo-Random Number Generator, EAE Version

W. Madeline Webber
Submitted by: Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

This random number subroutine generates numbers identical to those produced by DECUS programs Nos. 5-25 and L-64. Use of EAE greatly speeds execution time.

Minimum Hardware:	PDP-8/12, LINC-8 with EAE
Miscellaneous:	(Also L-114)
Source Language:	PAL-D

DECUS NO. 8-411

Mongoose Display System

Dale Lewellyn, Digital Equipment Corporation, Ann Arbor, Michigan

Mongoose is a set of two programs: Mongoose Sort and Mongoose Display. These programs are used in conjunction with the Lab-8 Advanced Averager and a grid of 16 analog inputs to produce an averaged, 3-D, topographical display surface corresponding to the voltages present at each of the inputs at a particular point in time. Such displays may be produced for each set of points in the signal epochs and are suitable for filming as frames in a motion picture showing the development of the averaged response present simultaneously over a wide area.

Minimum Hardware:	LAB-8 with 16 channels A/D and storage scope
Other Programs Needed:	Advanced Averager, Disk Monitor (optional)
Storage Requirement:	SORT: 10-44 and 7200-7504; Display: 7-177 and 3000-7577
Source Language:	Programs: PAL-D; Tables: MACRO-8

DECUS NO. 8-412

MRS X

F. C. Owen, General Railway Signal Company, Rochester, New York

MRS X is a debugging routine which will report on the teletype all program references to a given object address. A faulty program may be altering the content of a memory location when it is not desired. MRS X will find the instruction that is doing the altering. It is also useful to locate the users of constants, subroutines, etc.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	6600-6766 Page relocatable
Source Language:	PAL III

DECUS NO. 8-413

GROPE III/A and BINLOC

F. C. Owen, General Railway Signal Company, Rochester, New York

Octal machine language program editor and Binary Load-Compare. Combines the functions of several DEC utility routines plus some new features, such as sequential loading and block loading via keyboard and SEARCH. A special "HELP" Loader is furnished with the tapes.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7100-7777
Miscellaneous:	When ordering tapes, please specify whether Loader is needed for HSR or LSR
Source Language:	PAL III

DECUS NO. 8-414

LIST

F. S. Irani
Submitted by: Danny Harmon, Cognitronics Corporation, Mt. Kisko, New York

Lists the program name and the block numbers it occupies on DECtape. Also lists the numbers of the free blocks.

Minimum Hardware:	4K PDP-8, TC01/TU55
Storage Requirement:	0000 —> 3477 field Ø
Source Language:	PAL

DECUS NO. 8-415

Multiple Unit DECtape Copier

Paul J. Bezeredi, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This program allows the user the advantage of copying more than one DECtape simultaneously while accessing the master DECtape only once, thus saving time when making multi-copies of a program DECtape.

Minimum Hardware:	PDP-8, TCØ1 or TCØ8, 2 TU/55 transports or 1 TU 56 Dual transport
Storage Requirement:	0-777 Main Program; 1000-7100 Buffer Space
Restrictions:	DECtape must be of standard format
Source Language:	PAL

DECUS NO. 8-416b

Bibliographical Handling

J. F. Echallier, A. Laviron, F. Peronnet, P. Gerin, I.N.S.E.R.M., Lyon-Bron, France

This program makes it possible to store and to correct bibliographical data, from ASR33 to DECtape. It allows printout of references when given required characteristics. The program should prove useful wherever a great deal of data is to be stored, updated, and easily picked up.

A new version, dated June 1972, allows building of the bibliographical tape under PS/8 system.

Minimum Hardware:	4K PDP-8, ASR33, 2 DECtapes
Other Programs Needed:	Disk Monitor System (DEC-D8-SBAF)
Source Language:	PAL

DECUS NO. 8-417

XCORE

James Crapuchettes, Stanford Electronics Labs., Stanford University, Stanford, California

This program is used to help in the debugging and documentation of a program. It reads in absolute binary files and uses them to produce a memory allocation map which shows which locations were loaded (these are the locations which will be loaded by a binary loader when reading in these files). The allocation map is output on the teletype with a label when specified by the user.

Minimum Hardware:	PDP-8, TC01/TU55 DECtapes
Other Programs Needed:	DECUS NO. 8-64a (XSYSTEM)
Storage Requirement:	All of field Ø for program and internal tables
Restrictions:	Resides in field Ø, will map fields Ø through 3
Source Language:	PAL III with TEXT pseudo-op

DECUS NO. 8-418A & B

VEKSEL and PAPT

Ronald Zane, Institute for Astronomy, Honolulu, Hawaii

VEKSEL is a subroutine to convert ASCII code to PTTC-8 code commonly used in IBM equipment. PAPT is a program which uses VEKSEL to convert ASCII punched paper tape to PTTC-8 punched paper tape.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	VEKSEL 200-377; PAPT 400-451
Source Language:	PAL III

DECUS NO. 8-419

Nmr - Pulse for the Lab-8/I

Dr. James W. Cooper, Digital Equipment Corporation, Maynard, Massachusetts

Nmr-Pulse is designed for rapid data acquisition and Fourier transformation needed for pulsed nmr spectroscopy. It acquires 512 data points at rates from 34 μsec/point, and signal averages them. The Fourier transform is performed on command and a magnitude spectrum calculated.

Minimum Hardware:	LAB-8/I or 8/L with 4K of core
Source Language:	PAL 1Ø or MACRO-8

DECUS NO. 8-420

LOGSIM-8

Robert Stolarz, Princeton University, Princeton, New Jersey

LOGSIM-8 is an interactive digital logic simulation program for the simulation of combinational and sequential logic circuits at the gate level. The language is simple, and allows logical units such as flip-flops to be called as functions. The output consists of a table of the values of selected variables during each pass through the circuit description.

Minimum Hardware:	4K PDP-8, TTY

DECUS NO. 8-421

Chain Load

Claude J. Ortega, University of Chicago, Department of Medicine, Chicago, Illinois

This program supervises the loading from the systems device, of multiple field and/or multiple file system saved programs through the calling of a one page routine.

Minimum Hardware:	4K PDP-8, DECtape or disk, ASR33
Other Programs Needed:	4K Disk Monitor System, Version AF
Storage Requirement:	200-377 5600-5777
Source Language:	PS/8 PAL8

DECUS NO. 8-422

Binary Punch - Extended Memory II

James Vrancik, NASA, Lewis Research Center, Cleveland, Ohio

This program is an extension of Digital 8-5-U Binary Punch and DECUS NO. 8-142. It accommodates extended memory, punches data in blocks and does not punch consecutive halts. The write-up includes a short program to load the core with halts. The produced tapes can be loaded by Digital 8-2-U Binary Loader.

Minimum Hardware:	PDP-8, ASR33
Storage Requirement:	7600-7754
Source Language:	PAL III

DECUS NO. 8-423

Disk Editor With View for LAB-8

K. W. Ranatunga, University of Bristol, The Medical School, Bristol, England

Disk Editor (DEC-D8-ESAB-PB, 1968) has been modified slightly so that a 'V' (view) command made via the teletype is recognized. This command is like a 'L' (list) command except that the requested line of the text buffer is displayed on a CRO screen along with the 17 succeeding lines. Further, the reference numbers of these lines as given by the Editor are also displayed.

Minimum Hardware:	4K PDP-8/I, AXØ8 with option XR, Disk File (DF32)
Other Programs Needed:	Disk Editor (DEC-08-ESAB-PB)
Restrictions:	For each view command the corresponding display is issued only once, and thus the display should be stored on a storage CRO screen
Source Language:	PAL-D

DECUS NO. 8-424

Morse Code

C. Bumgardner and T. Bell
Submitted by: T. L. Drake, Clemson University, Clemson, South Carolina

This program accepts Morse code via a logic sense line in real-time and outputs the decoded message on the teleprinter. The pattern recognition algorithm in the program automatically adapts to the sending rate with the maximum reception rate of the computer being limited by the teleprinter to about 100 words per minute. The program classifies a key down condition as either a dot or a dash. The key up conditions are classified either as a space in a character, a space between characters, or a space between words. These pattern classifications permit each character to be decoded via a table look up.

Minimum Hardware:	4K PDP-8, Real-time Clock, Logic Sense Line
Miscellaneous:	Decoding algorithm does a better job when code is generated by an electronic keyer
Source Language:	XPAL, PAL III

DECUS NO. 8-425

Block-Modify for PS/8

Rudi Stange, Digital Equipment GmbH, Munich, Germany

This program is similar to the BLOCK-MODIFY for the Disk Monitor System, but uses the PS/8 DECtape Handler. It also can be changed to use any other PS/8 handler. It allows typeout of contents of any block (DECtape or Disk) and permits changes to any location in the specified block.

Minimum Hardware:	8K PDP-8, TC01 or DF32 or other Disk
Other Programs Needed:	PS/8 System
Storage Requirement:	4000-4577, page Ø as Buffer and LOC; 3000-3577 for PS/8 Handler storage
Source Language:	PAL 8

DECUS NO. 8-426

Prime Number Generator

Anonymous

This is a short, simple program to output prime numbers. No write-up - tape only.

Source Language:	BASIC

DECUS NO. 8-427b

MEMO III - A Text Formatting Program

Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

MEMO III is a program written for the OS/8 system to produce paged text with margins from free form text. The intention is to permit the user to produce a readable and neatly formatted copy of text with minimal effort.

MEMO III is a descendant of [illegible] Ruth's original program. This version permits output [illegible] OS/8 compatible output device, rather than restricting [illegible] to the teletype. Files written for MEMO and MEMO [illegible] compatible with MEMO III.

WITHDRAWN

Minimum Hardware: PDP-8/12, ASR33 (or equivalent) and either DECtape or Disk
Other Programs Needed: OS/8 Programming System
Miscellaneous: Same program is available on LINCtape as DECUS NO. 12-100
Source Language: PAL-8

DECUS NO. 8-428A

EAE - Modification to DECUS NO. 8-143, FFTS-R

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-143 FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-428B

EAE - Modification to DECUS NO. 8-144, FFTS-C

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-144 FFTS-C - A Fast Fourier Transform Subroutine for Complex Data, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-429

Intercorrelation 37

Gernot D. Kleiter and Ludwig R. Krysl, Psychologisches Institut der Universitat Salzburg, Salzburg, Austria

This program computes up to 630 intercorrelations (36 variables).

Minimum Hardware: PDP-8 with TTY, 4K CPU
Other Programs Needed: Floating Point Package #2 (Digital 8-5B-S)
Source Language: PAL III

DECUS NO. 8-430

DECK: A Random Deck of Cards

Alan Weiner, Needham High School, Needham, Massachusetts

DECK is a routine for getting an entire 52 card deck on a computer. As it is currently written it merely prints the deck out on the teletype. The algorithm used is simple; most of the program is used for typing the deck out in words.

Minimum Hardware: TSS/8, TTY
Source Language: BASIC8

DECUS NO. 8-431

8/I LAB Data System

Dr. D. J. Fader, Research Engineer, University of Western Ontario, London, Ontario, Canada

A system of programs for data acquisition and processing is described. A PDP-8 with special A/D and D/A hardware is used to produce mean, rms, histograms, covariances, correlations and other properties of analog input signals. Routines are available for processing results using FOCAL and a Compucorder tape cassette unit, and using a PDP-10 with a digital plotter.

Due to the sheer size of the documentation for this program we have broken it into two parts. The first, a "teaser" is supplied under the same circumstances as in normal documentation. The second, a set of five thick manuals, is subject to an extra charge. Contact the DECUS office for more information.

Minimum Hardware: 8K PDP-8, TTY, PDP-10 plus other devices noted in manuals
Storage Requirement: 8K PDP-8, 20K PDP-10
Restrictions: Use of all features requires special hardware
Source Language: PAL III, FORTRAN, FOCAL

DECUS NO. 8-432

Triple Precision Integer Package

M. T. Franklin, The Plessey Company, Limited, Fareham, Hampshire, England

This is a collection of useful subroutines for handling triple precision binary integers which are assumed to be positive numbers. They were developed for data processing type work and accounting where it was not desirable to use the floating point system.

Minimum Hardware: PDP-8, HSR/P, TTY

DECUS NO. 8-433

Extensions to "LIBRA-FOCAL"

B. Taylor, R. Helwig, A. Coston, L. L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, North Carolina

Certain changes have been made to the LIBRA 7-user FOCAL system (DEC-08-AJ5E) and also to FOCAL 1969 (DEC-08-AJAE). They include: FOCAL - Random number generator, power routine, symbol table checkpoint; LIBRA - Disk Data files, file protection, expanded FCOM function, correct user number on called programs; LIBRA - (optionally) - 680 teletype support, EAE support, DECtape save-restore (Reference Disk utility program).

Minimum Hardware:	8K PDP-8, optionally DF32 or RF08 Disk, EAE, DECtape, PT08 Teletypes or 680 Teletypes
Other Programs Needed:	FOCAL 1969, LIBRA.DF32 or LIBRA.RF08
Storage Requirement:	All of fields 0 and 1
Source Language:	PAL-8 with conditional assemblies

DECUS NO. 8-434.1 through 8-434.7

Data System for Magnetic Scanning Mass Spectrometers

James Plattner, University of Colorado Medical Center, Denver, Colorado

There are seven programs included in this system. The programs and their functions are:

8-434.1 SCAN - Acquires data from mass spectrometer and stores it on disk in Disk Monitor System format.

8-434.2 STD - Automatically identifies and converts times of peak emergence to masses for a scan of perfluoroalkane that has been acquired with the SCAN program. These results are stored on the disk for future use.

8-434.3 CONV - Effects a time to mass conversion by interpolation of a file of unknown compound spectra acquired with the SCAN program vs. a file of perfluoroalkane that has been acquired by the SCAN program and identified with the STD program.

8-434.4 TIC - Plots total ion current for a series of scans acquired by SCAN and time to mass converted by CONV.

8-434.5 TAB - Prints listings of spectra that have been converted to mass intensity files by the CONV program.

8-434.6 HIST - Plots spectra that have been acquired by SCAN and time to mass converted by CONV.

8-434.7 TUNE - Allows mass spectrometer interface to be optimized. Accumulator displays bias, oscilloscope displays timing pulses (sample rate).

Some of these programs can be implemented to work with other systems and therefore the tapes for each program may be ordered separately.

Minimum Hardware:	4K PDP-8, DF32 disk, ASR33, ADC1 A/D Converter, ms Computer interface
Other Programs Needed:	Disk Monitor System
Miscellaneous:	Incremental Plotter Optional
Source Language:	PAL-D

DECUS NO. 8-435

RECOVER

Kenneth H. Kolley
Submitted by: Michael Schatzberg, Singer-Kearfott Division, Fairfield, New Jersey

This is a program to read or write 32K words between disk and DECtape. This utility provides for saving a disk image on DECtape, restoring the disk from an image on tape and verifying a disk image against a DECtape. It is a disk to-and-from DECtape program.

Minimum Hardware:	8K PDP-8/I, DF32 disk, 1 DECtape
Storage Requirement:	0-1577 field Ø
Source Language:	MACRO-8, PAL-8

DECUS NO. 8-436

EAE - Simulator

Tuan VoDinh and Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This software simulates all the Extended Arithmetic Element (EAE) hardware instructions and allows the user to run any program which was originally written for a PDP-8/I having the EAE option on a PDP-8/I without it. All EAE instructions have to be replaced by corresponding JMS instructions.

Minimum Hardware:	PDP-8/I
Storage Requirement:	20_8 locations on page Ø plus 2 pages
Source Language:	PAL III

DECUS NO. 8-437

Computer Dating Game

Miller S. Lessell, William Diamond Junior High School, Lexington, Massachusetts

The purpose of this program is to measure the compatibility of two people by the similarity of their answers to questions on a broad variety of subjects.

Minimum Hardware:	4K PDP-8, ASR33, TTY
Source Language:	BASIC

DECUS NO. 8-438

DF-32/Sykes Swap

R. Dell and D. Branda, University of Illinois at Chicago Circle, Chicago, Illinois

This pair of programs transfers the entire contents of the DF-32 disk to or from a Sykes Compu-Corder model 1ØØ Tape Unit. It is useful for saving additional or special versions of the Disk Monitor System.

Minimum Hardware:	PDP-8/I, DF-32, EAE, Sykes Compu-Corder Cassette
Other Programs Needed:	"BASIC" routine supplied by Sykes
Storage Requirement:	Buffer: 0-6001; Coding: 6002-6777
Source Language:	PAL-D

DECUS NO. 8-439

MOVE

John Alderman, Applied Data Research, Atlanta, Georgia

This is a program to copy images of directory devices, including the system portion of SYS:.

The program will be obsoleted by DEC supplied version of PIP eventually.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 System
Storage Requirement:	2000-5000
Source Language:	PAL-8

DECUS NO. 8-440

PIPL

John Alderman, Applied Data Research, Atlanta, Georgia

This is a version of PS/8 PIP, modified to add two options, in order to be able to label paper tapes with legible symbols punched into the tapes.

These new options are /M (mark) and /W (write). They are used with either ASCII or Binary mode file transfers under PS/8, and usually are intended for direct output onto a paper tape punch, although any output device is legal.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. 8-441

DELETE

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

DELETE is a small PS/8 utility program which will delete up to nine files specified in a Command Decoder input string. If the terminating character is ALT MODE, DELETE will return to the monitor when deletion is complete. Otherwise it will request another input string.

Minimum Hardware:	8K PDP-8 with a mass storage device
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12000-12577; 12600-13177 (buffer); 03200-03377 (I/O handler)
Source Language:	PAL-8

DECUS NO. 8-442

"The BYU Boob Tube"

Associated Computer and Electronic Technologists
Submitted by: James A. Williams, Brigham Young University, Provo, Utah

When loaded and run under COLPAC 1970 (DECUS NO. 8-335) this program will, by presentation on a CRT, show the capabilities of a PDP-8 to make movies. It is a short cartoon demonstration program which uses most locations in a typical 8K PDP-8 (field 0 & 1). The program was written by students in the Electronics Technology department at BYU; comments may be directed to James A. Williams.

Minimum Hardware:	8K PDP-8, HSR, ASR33/35, KV-8 CRT or equivalent
Other Programs Needed:	COLPAC, 1970 (DECUS NO. 8-335)
Source Language:	COLPAC 1970

DECUS NO. 8-443

Keyboard Test Tape for Hot Metal Linecasters with TTS

Lance O. McCartney, Ambassador College Press, Pasadena, California

The purpose of this program is to test linecaster TTS units with tape to operate in keyboard order with slight pause between characters. Quad center code is not included but could easily be added.

Minimum Hardware:	4K PDP-8/I, High-speed 6 level paper tape punch
Storage Requirement:	0-500
Source Language:	PAL III

DECUS NO. 8-444

COREMAP

Joel Troster, Institute of Bio-Medical Electronics and Engineering, University of Toronto, Toronto, Ontario, Canada

This is a one page relocatable program to type a map of any field of core by searching for a number set in the S.R. (e.g. HLT or Zero).

Minimum Hardware:	PDP-8, ASR
Storage Requirement:	7600-7611, 7617-7623 plus 1 page anywhere
Source Language:	PAL III

DECUS NO. 8-445

FYLHLP - PS/8 File Utility Program

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

FYLHLP is a utility program designed to help the PS/8 systems programmer maintain the file system and debug file handling programs. It allows the user to list specific directory entries plus all "empty" entries on a file-structured device and to examine, modify and search blocks on the same device.

Minimum Hardware:	8K PDP-8; a mass storage device
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12ØØØ-12577; 126ØØ-13177 (buffer); Ø32ØØ-Ø3377 (I/O Handler)
Source Language:	PAL-8

DECUS NO. 8-446

A Patch to FFTS-R for Use Without the EAE

Gregory R. Ruth, MIT Charles Stark Draper Laboratory, Cambridge, Massachusetts

This patch permits the use of the Fast Fourier Transform subroutine for real valued functions (DECUS NO. 8-143) on machines without an EAE. Except for the speed of execution, the subroutine is in no way affected. Execution times for the subroutine with the patch are about three times longer.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FFTS-R (DECUS NO. 8-143)
Storage Requirement:	136_8 locations
Source Language:	PAL-8

DECUS NO. 8-447

Roots of a Polynomial by Muller's Method

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program implements Muller's root-finding method for users of BASIC. The program guides the user through entering the necessary data. Then the data are echoed in easily-readable format. After a delay until all roots are evaluated, the program types out the roots in tabular form.

Minimum Hardware:	8K PDP-8/I, ASR33
Other Programs Needed:	Edusystem 20 BASIC
Restrictions:	Execution time may be long
Source Language:	BASIC (Edusystem 20 implementation)

DECUS NO. 8-448

CORDMP - Formatted Octal Dump

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program punches an octal core dump into tape for off-line listing. The dump arranges the contents of 8 core locations on a line, with the starting address at the left, and with column headers for easy reading. Markers are provided for cutting the listings into 11-inch lengths. The accumulator lights display each address being punched.

Minimum Hardware:	4K PDP-8/I, ASR33, HSP
Storage Requirement:	One page page-relocatable in any field
Restrictions:	Dumps only one field or portion at a time
Source Language:	PAL-8/PAL III

DECUS NO. 8-449A

A Magtape Handler for the PDP-8/TU20

Howard Shapiro and Peter Lemkin, National Institutes of Health, Bethesda, Maryland

An I/O device handler is given for the TU20/TC58 Magtape. It enables reading, writing, read compare, advance and backspace records and writing end of files. It can also sense the tape's condition.

Minimum Hardware:	4K PDP-8, TU20/TC58 Magtape
Other Programs Needed:	Interrupt handler to dispatch to the magtape interrupt service routine
Storage Requirement:	Magtape is 1 page, buffer may be up to 4K in any field
Restrictions:	Set up for running on interrupt
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449B

LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

LPTQUE is a PDP-8 utility program which is used to buffer ASCII characters input from a PTØ8 to an A. B. Dick 94Ø Line Printer using the Eclectic Computer Company interface. The PDP-8 teletype may be used to send data out of the PTØ8.

Minimum Hardware:	4K PDP-8, A. B. Dick 94Ø Line Printer with Eclectic Computer Company Interface, PTØ8
Storage Requirement:	<200,577>, <600,4577>
Restrictions:	Form feeds and tabs not implemented
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449C

TALK1Ø - A PDP-8/PDP-10 Utility-Loader

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

The assembly of large programs for small machines such as a PDP-8 is apt to be laborious, time consuming and almost impossible if done on the small machine itself. In addition, the ability for many users to assemble PDP-8 programs on a PDP-10 computer using PAL-1Ø or PAL-12 lightens the load of software development on the smaller machine. TALK1Ø is

DECUS NO. 8-449C (Continued)

a PDP-8 utility/loader program. It decodes and loads ASCII coded binary files (encoded by TALK8F, DECUS NO. 10-139) sent from the PDP-10. It can transmit information to or from the PDP-10, appearing to it as a regular teletype.

Minimum Hardware:	4K or more PDP-8 with PTØ8 Interface to Dataphone or directly to PDP-10
Other Programs Needed:	TALK8F (DECUS NO. 10-139), PAL1Ø or PAL 12, all on PDP-10
Storage Requirement:	Currently <7ØØØ-7577> for program, <3200-6777> for the buffer
Restrictions:	If the PTØ8 data rate is 1Ø char/sec, large TTY buffers will overflow
Source Language:	PAL-1Ø

DECUS NO. 8-449D

Buffered I/O Subroutines for the PDP-8

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

BUF1Ø is a collection of three PDP-8 PAL subroutines which can be used for doing asynchronous character input/output. They are also useful for doing any word asynchronous queuing in other types of programs.

Minimum Hardware:	4K PDP-8
Storage Requirement:	1 page for the program and QUEUE size
Restrictions:	QUEUE size must be $<4ØØØ_8$ locations
Source Language:	PAL

EDITOR'S NOTE: The above 4 programs (8-449A, B, C, D) are available on one PDP-10 formatted DECtape together with DECUS NO. 10-139.

DECUS NO. 8-450

PS/8 Editor With Display for KV8/I (Overlay)

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This overlay provides the user with a welcome expansion of the PS/8 EDITOR. It provides: 1) Variable-size character generator, 2) Display of line numbers in scope-mode, 3) Too long lines cause automatic CRLF, 4) Permanent incorporation of HSR for "APPEND," "INSERT" from high speed reader.

Minimum Hardware:	PDP-8 with KV/8 Display and/or HSR
Other Programs Needed:	PS/8 Monitor System, PS/8 Editor
Storage Requirement:	15600-16577
Source Language:	PAL III, PAL-8

DECUS NO. 8-451

PS/8 Handler for KV/8 Vector Display

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This character generator is primarily intended to be incorporated as a device-handler in a PS/8 oriented system. It was especially designed to fit in a very small space (2-page handler). Upon entry it computes cross-page references and indirect pointers from a JMS. instruction, and is therefore completely page-relocatable. It detects CTRL/FORMs and full picture condition and then waits for the ERASE-button to be pushed.

Minimum Hardware:	PDP-8 with KV/8 Display System
Other Programs Needed:	PS/8 Programming System
Storage Requirement:	2 pages, Run-time Relocatable
Restrictions:	No tabulation incorporated
Source Language:	PAL III, PAL-8

DECUS NO. 8-452

ANSAM (Analog Sampling)

Edward Longhi, VEECO Instruments, Inc., Plainview, Long Island, New York

It is often desirable to set the level of an external device connected to the AXØ8. This program allows the user to have typed out the voltage level appearing at analog channel Ø, 1, 2 or 3 of the AXØ8. The channel to be sampled is entered via the TTY and continuous sampling ensues until halted by striking a random key. A new channel may then be selected. Typeout is directly in millivolts, including sign.

Minimum Hardware:	PDP-8, AXØ8, ASR33
Storage Requirement:	1 page
Source Language:	PAL III

DECUS NO. 8-453

Rapid Alert Program (RAP)

Richard Bachman, U. S. Naval Undersea Research and Development Center, San Diego, California

RAP, used to predict Naval Navigation Satellite rise times, is approximately 100 times faster than previous alert programs. Degradation of alert accuracy is insignificant.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFC1-PB and DEC-08-AFC3-PB)
Storage Requirement:	0-6066, 7267-7777
Source Language:	FORTRAN

DECUS NO. 8-454

Radio Teletype to ASCII

Carl Kishline, University of Wisconsin, Parkside Instructional Computing Center, Kenosha, Wisconsin

This program reads 5-channel tape as generated by a model 15 or 19 teletype and prints (and optionally punches) the corresponding characters in ASCII code. It thus allows computer operators to enjoy the beautiful art work which amateur radio operators produce.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	2 pages
Source Language:	PAL-D

DECUS NO. 8-455

CRTPAC

B. K. Moritz and M. E. VanHoosier, Naval Research Laboratory, Washington, D. C.

CRTPAC is a flexible high speed character generator and display package. It features a full ASCII character set, sub and superscripting and variable character size under program control. It makes use of a column representation algorithm resulting in average character display time well under 600μs.

Minimum Hardware:	4K PDP-8/I, VC8I or equivalent, EAE recommended
Miscellaneous:	Tapes available require EAE
Source Language:	PAL-8

DECUS NO. 8-456A

PIP "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

PIP "AH" is a modification of PIP "AF" (DEC-D8-PDAD) for use with the RK08 cartridge disk file and BUILD "AH" (DECUS NO. 8-456B). The LP08 line printer has been implemented to list ASCII files and device directories. Other changes to PIP have corrected tab control for ASCII files, provided paging for the ASR33 teletype, eliminated problems in combining ASCII files, and removed the S: , SØ: restriction for the RF08 and DECtape. Versions of PIP "AH" are also available for DF32, RF08 and DECtape systems.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	BUILD "AH" (DECUS NO. 8-456B)
Storage Requirement:	25 octal blocks
Source Language:	PAL

NOTE: A LINCtape of 8-456A and 8-456B has been submitted by Mark Hyde, DeWitt, N. Y. for OS/12 users.

DECUS NO. 8-456B

BUILD "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

BUILD "AH" is an extension of the "AF" Disk System Builder (DEC-D8-SBAF) and will build the Disk/DECtape Monitor System on the RK08 cartridge disk file. The RK08 system structure is similar to the RF08, with each cartridge containing two pseudo devices. Each pseudo device has a storage capacity of 3,000 octal blocks and its own directory. BUILD "AH" also permits the LP08 line printer to be defined as a system output device recognized by the command decoder. All functions of the "AF" builder are retained. BUILD "AH" eliminates required conversion of programs currently operating under the Disk Monitor System when the RK08 is obtained for use with PS/8.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	PIP "AH" (DECUS NO. 8-456A)
Source Language:	PAL

DECUS NO. 8-457

DTFIX

P. T. Hodgin, Jr., Research Computation Center, Indianapolis, Indiana

This is a TSS/8 program to handle DECtapes, including ZEROing, COPYing, LISTing and DEPOSITing. A method is available to return to "OPTION?" at any time during the running of the program.

Minimum Hardware:	PDP-8/I with TS/8 Monitor (or equivalent), DECtapes
Other Programs Needed:	TS/8 Monitor
Storage Requirement:	6 Disk Segments (12 DECtape segments)
Source Language:	PAL-D

DECUS NO 8-458

VW - Field Independent I/O Handler for Disk and TTY

R. A. Seeman, The Boeing Company, Renton, Washington

This program provides field independent disk transfers and TTY message typeout. It can reside in any core field and can be called from core field without restriction, except that the program cannot reside in Page Ø. It is a user called subroutine and requires no program other than the user program.

Minimum Hardware:	4K PDP-8, ASR33 or 35, DF32
Storage Requirement:	200_8 (one page)
Source Language:	PAL-D

DECUS NO. 8-459

TAYEX - Taylor Expansion Equation Solver

David G. Pitts and James Westgard, Indiana State University, Terre Haute, Indiana

TAYEX is a program to solve differential equations by use of the Taylor series and an iteration procedure for the coefficients. It can solve any number of simultaneous nonlinear differential equations. One pass of the program is needed to type a table of values for each variable.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	Basic Floating Point Package (DEC-08-YQ1A-PB) or 4 word Floating Point Package (DEC-08-FMHA-PB)
Storage Requirement:	0-577, 5600-7577
Source Language:	PAL III

DECUS NO. 8-460

TT89 - Tape Transfer PDP-8 to PDP-9

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

This program writes ASCII files from PDP-8 devices onto a PDP-9 DECtape. The PDP-9 DECtape directory can also be listed or zeroed, and files can be deleted.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-D

DECUS NO. 8-461

COPY1Ø - PDP-10 DECtape Program for the PDP-8

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

COPY1Ø reads and writes files between PDP-8 devices (disk, DECtape (in TSS/8 format), paper tape) and a PDP-10 DECtape. ASCII files can be read from or written to the PDP-10 DECtape. BIN files (generated by PAL-10) can also be read. Program also reads PDP-10 ASCII paper tapes.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape Control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-1Ø

DECUS NO. 8-462

INSTIN

Paul Kinzelman, Carnegie Mellon University, Pittsburgh, Pennsylvania

INSTIN is a program which will solve instant insanity. The puzzle consists of four cubes, each side of which is colored white, red, green or blue. To solve the puzzle, one must stack the cubes in a line so that each color appears only once along a side which is four cubes long. The program will find and print out all the basic solutions. The program allows the user to change the puzzle by switching colored sides or by changing the color of sides. The user may inhibit the printing of the solutions to determine the number of basic solutions quickly.

Minimum Hardware:	Any configuration which will run BASIC
Miscellaneous:	Owning the puzzle "Instant Insanity" seems to be a prerequisite
Source Language:	BASIC

DECUS NO. 8-463

Perpetual Calendar (BASIC Version)

Daniel Gutierrez, Granada Hills High School, Granada Hills, California

This program is similar to DECUS NO. 8-71 but is written in BASIC. It will provide the day of the week for any date entered. It is particularly useful for demonstrating the computer's ability to perform simple problems as well as more complex ones.

Minimum Hardware:	4K PDP-8 with Teletype
Source Language:	BASIC

DECUS NO. 8-464b

MTA: TRØ2 Magnetic Tape Handler

Lawrence E. Holboke, Environmental Protection Agency, Research Triangle Park, North Carolina

A two page handler which allows the use of a 7 or 9 track type TRØ2 incremental magnetic tape in a manner similar to DECtape. Tape motion has been reduced to a minimum to increase speed. Each block of data (256 words) is contained in one tape block along with parity bits and block number identification. Parity checking is done twice for every word read and status tests are performed before and after each read, write and positioning operation. In case of parity error, three additional reads are attempted before a fatal error exit is taken. Up to 2Ø47 blocks are available, depending on the length of tape. All interrupt flags are left down at exit. Tape must be formatted prior to use with "MTAMRK" and must be initialized at each loading with "INIT". Unloading is accomplished by "UNLOAD."

Minimum Hardware:	OS/8, TRØ2 Incremental Magnetic Tape
Storage Requirement:	256
Source Language:	PAL

DECUS NO. 8-465

The SKED Software System

Dr. A. G. Snapper, Psychology Research Lab., Franklin D. Roosevelt V. A. Hospital, Montrose, New York
Contribution and submittal by: Andrew Walker, Digital Equipment Corporation, Maynard, Massachusetts

SKED is a process control software system that has been developed for use in the behavioral research laboratory. The software system consists of:

DECUS NO. 8-465 (Continued)

A. The Two-Pass SKED Compiler, B. The Run Time System (R.T.S.), C. The Debug System, D. The System Builder.

Minimum Hardware: 4K PDP-8, ASR33, real-time 1ØØ cycle clock, hardware interface between processor and the experimental stations. High speed reader and punch and extra 4K useful and desireable

Note: Because of the excessive size of the listing and ASCII tapes the service charges will be $10.00 for each.

DECUS NO. 8-466A

RL Monitor System (WCFMPG Version)
P?S-08-1.1A

Richard Lary, et al
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This system is a general purpose monitor, editor, file handler, etc. It is specifically designed to run on a near minimal configuration (4K and one DECtape drive). It allows the user to save both source and binary files on the DECtape. The line number editor permits resequencing, editing, deleting lines, auto-sequence mode.

Minimum Hardware: 4K PDP-8, ASR33, TU55 DECtape drive, TCØ1 controller
Storage Requirement: Ø-7777
Source Language: PAL III

DECUS NO. 8-466B

RL Monitor Subsystems
P?S-08-1.1B

Richard Lary
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

Two subsystems are given: BIN - A Binary Loader- Allows loading from binary DECtape files. EDIT - A Batch Facility - Allows executing monitor commands from DECtape source files.

Minimum Hardware: 4K PDP-8, ASR33, TU55 DECtape drive, TCØ1 controller
Other Programs Needed: RL Monitor System
Source Language: PAL III

DECUS NO. 8-466C

Listing Utility Programs
P?S-08-1.1C

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

There are three listing routines described in this package:
TIDY - Makes neat listings of PAL III source programs.
LISTER - A SNOBOL program which is slower than TIDY but gives page numbering, headings and storage locations.
SNOLST - A SNOBOL program similar to LISTER, which makes neat listings of POLY SNOBOL source programs.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: SNOLST and LISTER require POLYSNOBOL, TIDY requires PAL III, RL Monitor
Source Language: POLY SNOBOL and PAL III

DECUS NO. 8-466D

RL Monitor System Utilities
P?S-08-1.1D

Mario DeNobili, et al
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

PACK, UNPACK - allows reshuffling of RL Monitor source files. SYLIST, UPDATE - allows dumping and creating subsystems. *BPTTMT - allows conversion of DEC binary paper tapes to RL DECtape format. *PUNTAP, PUNSYS RLOADR - allows quick conversion between paper tape and DECtape information.

*NOTE - Although these routines are listed here and are on the RL Monitor System DECtape there are no write-ups currently available for them.

Minimum Hardware: 4K PDP-8, ASR33, TU55, TCØ1
Other Programs Needed: RL Monitor System
Source Language: PAL III

DECUS NO. 8-466E

DECtape Utility Programs
P?S-08-1.1E

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

DUMP: General purpose system to dump blocks from DECtape in both octal and packed ASCII, to transfer blocks from one tape to another, and to change specific words in a given block.
DECTAP (and FASTAP): One-page subroutines which allow you to easily read and write blocks of information on DECtapes.
4MAT: This routine is used to format new DECtapes. It is contained on the RL Monitor System DECtape (DECUS NO. 8-466UØ) but not on the paper tape offered for this program.

Minimum Hardware: 4K PDP-8, ASR33, TCØ1, TU55
Storage Requirement: DUMP: 4 pages; DECTAP: 1 page
Source Language: PAL III

DECUS NO. 8-466F

PAL III Modified for RL Monitor

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a modified version of DEC's PAL III assembler which takes source from TTY or DECtape files and produces binary on TTY or DECtape files.

Minimum Hardware:	4K PDP-8, ASR33, TCØ1, TU55
Other Programs Needed:	RL Monitor System
Restrictions:	Only assembles 4K programs, cannot use high speed punch
Source Language:	PAL III

DECUS NO. 8-466G

POLY SNOBOL
P?S-08-1.1G

Hank Maurer
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a string manipulation language which is a weak form of SNOBOL I, originally developed by Griswold, Farber and Polonsky of Bell Telephone Laboratories. It bears only faint resemblance to SNOBOL IV.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	Runs stand alone or under RL Monitor (requires EAE in latter case)
Source Language:	PAL III

DECUS NO. 8-466H

POLY LISP
P?S-08-1.1H

Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a weak, but useful, LISP interpreter. Source files can come from DECtape.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	Runs stand alone or under RL Monitor System
Source Language:	PAL III

DECUS NO. 8-466I

FOCAL Modified for RL Monitor

Mario DeNobili
Submitted by: Stanley Rabinowitz, Polytechnic Question Society, Brooklyn, New York

This is a modified version of DEC's FOCAL compiler. Source can come from DECtape files.

Minimum Hardware:	4K PDP-8, ASR33, TU55, TCØ1
Other Programs Needed:	RL Monitor System
Source Language:	PAL III

DECUS NO. 8-466UØ

The sources and systems for all the above programs, on an RL Monitor System DECtape, may be ordered under this number.

DECUS NO. 8-467a

BINREAD (Revised Version)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Disassembles binary object tapes, giving an octal listing of all field and address codes, and of the data/instructions which follow them. Data are arranged in 8-line paragraphs, facilitating address counting. The format is familiar and legible; the execution is rapid. In addition, certain errors are checked for; if found, the computer halts after typing ?. The tape checksum is read and printed out; it is followed by a computed checksum which should agree with it.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	8/E: 4000-4310; 8/I etc: 4000-4321
Source Language:	PAL III

DECUS NO. 8-468

DIPDUB, A Dual-Independent Parameter, Double-Precision Pulse-Height Analysis Code

W. H. Wilkie, Ph.D., University of Pittsburgh, Pittsburgh, Pennsylvania

DIPDUB is a powerful, general-purpose, pulse-height analysis code designed for radiation physics applications where 255-channel energy resolution is adequate. Some features are: independent operation of 2 ADC's; 7 data regions in core; 369 DECtape storage blocks; spectrum stripping; very flexible display capability.

Minimum Hardware:	PDP-8 series with 8K core and EAE; Fast Paper Tape Unit; DECtape, PHA interface NKO4-A; 2 Nuclear ADC's; Oscilloscope
Source Language:	PAL-10

DECUS NO. 8-469

Top Secret

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This routine accepts characters from the keyboard of an ASR33 and responds by typing a ciphered version of the input text. It has three uses: (a) pure amusement, (b) as a demonstration of the fact that an on-line teletype is not a typewriter; it will

DECUS NO. 8-469 (Continued)

print what the computer tells it to print, which may or may not be what the user types. (c) as a simple example of input-output programming and of program branching, for students of machine language.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: PAL III

DECUS NO. 8-470

ODT-11 (High) Modified

J. Shanahan
Submitted by: J. H. McClure, E. I. duPont de Nemours and Co., Wilmington, Delaware

Since it is sometimes necessary to work on programs longer than can be accommodated by ODT-11 (e.g. program occupying locations $0\text{-}7576_8$), the ODT-11 program was modified to enable transfer to another bank of core memory. ODT-11, modified, resides in data field Ø, program being debugged resides in data field 1. All the operations and instructions given in Manual Digital 8-12-S, ODT-11, August 26, 1965, apply and are used as indicated.

Since there is a slight variation when using a KSR35, please specify when ordering tape whether for ASR33 (Tape A) of KSR35 (Tape B).

Minimum Hardware: 8K PDP-8
Storage Requirement: 745 (octal) locations, resides between 6632 and 7577, also uses loc 0005
Restrictions: Differs from ODT-11 in that it operates outside the core memory module in which it resides

DECUS NO. 8-471

Verify Paper Tape (12K)

J. Shanahan
Submitted by: J. H. McClure, E. I. duPont de Nemours and Co., Wilmington, Delaware

This is a program to verify that a tape is the same as the one from which it was copied, or that two copies of a tape are the same. It is applicable to a PDP-8 system having at least 12K core.

Minimum Hardware: 12K PDP-8 with EAE

DECUS NO. 8-472

PS8IN, PS8OUT

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

Designed to make PS/8 input-output programming much easier, the two modules perform automatic actions like calling the COMMAND DECODER, opening and closing files, etc. A JMS to PS8IN simply returns the next character, a JMS to PS8OUT writes it away. The routines relieve the programmer from the cumbersome PS/8 I/O programming, and they can be used separately. (These two modules make PS/8 input-output programming as easy as teletype input-output.

Minimum Hardware: PS/8 configuration
Other Programs Needed: PS/8 software
Restrictions: Designed for 8 bit ASCII on Binary, resides in Field 1 only, not restartable
Source Language: PAL-8

DECUS NO. 8-473

Three Utility Routines for PS/8
1. DTA and DECLAB
2. CHANGE and REMOVE
3. LIST

John R. Covert, Georgia Institute of Technology, Atlanta, Georgia

1. DTA and DECLAB provide an automatic assignment of user device names to DECtapes from an internally recorded label. It reduces errors from specifying the wrong DECtape on multi-drive systems.

2. CHANGE and REMOVE pseudo-commands provide the ability to change names in the directory of a PS/8 device with a simple "command," and the ability to remove up to 32 files with one command. It provides more comprehensive error messages than PIP.

3. LIST is a program to list PS/8 directions on KV8/I scope.

Minimum Hardware: PDP-8 with DECtape
Other Programs Needed: PS/8 software
Source Language: PAL-8

DECUS NO. 8-474

EXIT PS/8

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

The EXIT program is used to exit from the PS/8 programming system. EXIT will determine what the system device is and load in the proper bootstrap. The program will also load a binary loader into Field 1 and rewind all DECtapes.

Minimum Hardware: PDP-8 DECtape, Disk
Other Programs Needed: PS/8 software
Source Language: PAL-8

DECUS NO. 8-475

PIPQ

John C. Alderman, Jr., Applied Data Research, Inc., Atlanta, Georgia

PIPQ is an extension of PIPL (DECUS NO. 8-440). This version adds the /Q option which is a facility similar to the

DECUS NO. 8-475 (Continued)

PDP-12 DIAL QL (quicklist) assembler command. The /W and /M options are retained from PIPL and work the same as in DECUS NO. 8-440.

Minimum Hardware: PS/8 configuration
Storage Requirement: 12000-17577
Source Language: PAL-8

DECUS NO. 8-476 (OBSOLETE)

PS/8 LOG Command

For users who previously ordered this program the following patches are suggested.

To eliminate LOGON feature: During system generation, after loading the modified PS/8 tape and CONFIG, change location 00271 from 4052 to 7000 using ODT.

On DECtape based system: The LOGON, OFF, and KJOB commands use location 07777 for a flag to indicate LOG ON or OFF status.

For CONFIG with DECtape system handler at 07777 change the line reading "SBLKCT=7777" to "SBLKCT=7753." This assumes that the disk that would use location 7753 for data break is not present in a configuration where DECtape is the system device.

DECUS NO. 8-477

RIBIER - A Program for the PDP-8/I Enabling the Transition from the PS/8 System to the Paper Tape System

Rene P. Loretan, University of Essex, Colchester, Esses, England

Loads the RIM and BIN loaders in the original position in both fields by first calling them in a lower core region and execution of a relocation program. Afterwards, the memory locations up to 7477 are cleared and control is given to the binary loader with IF=1, DF=0.

Minimum Hardware: 8K PDP-8, One DECtape transport
Storage Requirement: 7600-7777 and 17600-17777 (like PS/8 monitor)
Source Language: PAL-8

DECUS NO. 8-478

Monitor Command Extensions in PS/8

John R. Covert, Georgia Institute of Technology, Atlanta, Georgia

OBSOLETE

This package exp[illegible] monitor ('.' mode) command set. It adds LOGON, [illegible], CREATE, EDIT, COMPILE, DELETE, RENAME, DIRECT and FILE commands in PDP-10 compatible syntax.

See also DECUS NOS. 8-334, 8-473 and 8-476.

Minimum Hardware: PS/8 configuration
Other Programs Needed: PS/8 software
Restrictions: Uses slightly more disk than 6 Nov. 70 release of PS/8; some monitor level operations will be slower for DECtape only configuration.
Source Language: PAL-8, FORTRAN

OBSOLETE

DECUS NO. 8-479

PDP-8/E Instruction Simulators for Other PDP-8's

Guy L. Steele, Jr., Brighton, Massachusetts

These subroutines allow the user of a PDP-8 other than an 8/E to write programs or use programs intended for an 8/E. They simulate the operation of the 8/E instructions BSW and the standard MQ microinstruction combination, using one-word JMS's. Thus, with JMS's substituted for micro instructions an 8/E program can run on any PDP-8.

Minimum Hardware: PDP-8 (any model)
Storage Requirement: 7 locations on page Ø and 43_{10} on any other page(s)
Restrictions: No provision is made for crossing instruction fields or for EAE
Source Language: PAL III

DECUS NO. 8-480a

Two Subroutines for 8K FORTRAN
1. INPUT
2. RANDU and GAUSS

Lars Palmer, A. B. Hassle, Goteborg, Sweden

1. INPUT is a relocatable input routine for input in free format to 8K FORTRAN programs.

2. RANDU and GAUSS are random number generators for 8K FORTRAN.

Minimum Hardware: 8K PDP-8 with TTY or HSR
Other Programs Needed: 8K FORTRAN System
Storage Requirement: 1. 4 pages; 2. 3 pages
Source Language: SABR

DECUS NO. 8-481a

MERGE

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

MERGE reads any number of binary paper tapes and combines their contents into a single binary output tape with a single checksum. Field pseudo-ops are correctly copied; ASCII diagnostics enclosed between rubouts are ignored.

DECUS NO. 8-481a (Continued)

Minimum Hardware: 4K PDP-8, ASR33 (HSR/P optional)
Source Language: PAL III

DECUS NO. 8-482

Patch to High ODT (DEC-08-COC2-PB)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This short patch prevents the occasional punching of channel 8 at the beginning address of a binary tape produced by the "P" command in ODT. It allows a restart after "T" or "E" commands simply by pressing "CONTINUE." Trailer halts when S. R. bit Ø is cleared.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: ODT-8
Miscellaneous: Patch is for HIGH ODT but could easily be modified (3 places) for LOW ODT
Source Language: PAL III

DECUS NO. 8-483

GRFIT, A Simple Least Squares Routine

R. C. Gross, Eastman Kodak Company, Rochester, New York

This program accepts data for the arrays x and y where there is scatter in the y array. It calculates the best least squares straight line and gives standard error estimates. A subroutine version that is essentially the same is also included.

Minimum Hardware: 8K PDP-8, 1 DECtape
Other Programs Needed: PS/8 Operating System and FORTRAN
Miscellaneous: See also FOCAL8-209
Source Language: PS/8 FORTRAN

DECUS NO. 8-484

RESTore for the RKØ8

Lee H. Nichols III, E. I. duPont de Nemours and Co., Inc., Wilmington, Delaware

RESTore is a sequel to REST (DEC-08-RWDA) for the Disk Monitor System built on a RKØ8 cartridge disk file. RESTore allows the user to create a protected area for regularly used programs or data files and leave the remainder of the disk pseudo-device as a working scratch area. Whenever the scratch area is filled or no longer needed, it can be quickly erased without disturbing the protected programs.

Minimum Hardware: RKØ8 Cartridge Disk File
Other Programs Needed: BUILD "AH" (DECUS NO. 8-456B)
Storage Requirement: 2 octal blocks
Restrictions: For use with RKØ8 only
Source Language: PAL

DECUS NO. 8-485

Geometric Data Truncation for Fourier Transform Programs

E. A. Barnhardt, Southwestern at Memphis, Memphis, Tennessee

This program is intended for use as a truncating-weighting subroutine. The application of a weighting function to the data record before the application of a Fourier transform program reduces the spread in frequencies which results from the transformation of a finite record.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FFT
Storage Requirement: 115_8
Source Language: PAL III

DECUS NO. 8-486

SEGAR 7: A Seven Segment Array for Alphanumeric Character Generation

David J. Dowsett, Atkinson Morley's Hospital, Wimbledon, England

This program is designed as a 1 1/2 page (with pointers on page Ø) subroutine for displaying easily observed labels on an oscilloscope screen.

A seven segment display allows all numerical and some useful alphabetical characters to be generated. Spacing is automatic and can be altered.

Minimum Hardware: PDP-8; 34D Scope
Source Language: PAL III

DECUS NO. 8-487

Revised Octal Memory Dump

Masashi Kamii
Submitted by: Tomoji Yanagita, The Central Institute of Experimental Animals, Nogawa Kawasaki, Japan

This routine will output on the teletype an absolute address plus octal contents of 8 memory locations per one line and a blank line at every 8 lines. Except for the first address the leftmost address is always a multiple of 8, making it easy to search addresses.

Minimum Hardware: PDP-8, ASR33
Source Language: PAL III

DECUS NO. 8-488

NEWPAGE

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program reads a binary tape on the low speed reader and punches out a relocated copy on the low speed punch. Address instructions are augmented by an integer number of

DECUS NO. 8-488 (Continued)

pages selected by the user.

Warning: It will not augment address pointers; main use will be with routines one page or less in length.

Minimum Hardware:	4K PDP-8; (HSR/P optional)
Restrictions:	Field pseudo-ops will not be copied; field instructions will
Source Language:	PAL III

DECUS NO. 8-489

SUBSET, Interger Compiler and Operating System

R. F. LaFontaine, CSIRO, Highett, Victoria, Australia

SUBSET has been developed for the 4000 word PDP-8 computers. It comprises a one-pass compiler which interprets FORTRAN/FOCAL-like source programs, and a double precision integer operating system. Its features are the ease which the system can be expanded by relocatable binary subroutines, and a reasonable amount of free memory available for the user's program (5600 octal words).

Minimum Hardware:	PDP-8/S, Teletype keyboard/Reader-Printer/Punch
Other Programs Needed:	DECUS NO. 8-130A and 130B
Storage Requirement:	0-7577
Source Language:	MACRO-8

DECUS NO. 8-490

Tape Alteration Program

C. N. Goode, University of Edinburgh, Edinburgh, Scotland

The purpose of this program is to examine and change the contents of any location on a DECtape. One block of a DECtape is called down into core and its contents examined and changed if required. The block is then written back onto the tape.

Minimum Hardware:	4K PDP-8, TU56 DECtape
Storage Requirement:	ØØØØ-1641
Source Language:	PAL-8

DECUS NO. 8-491

Indexed Floating Point Math Subroutines for PDP-8/E

Jacques Ricard, National Film Board of Canada, Montreal, Canada

This package of subroutines, which may be assembled in any order and anywhere in 4K, contains subroutines to perform floating point add, subtract, multiply, divide, input and formatted output, as well as logical operations and housekeeping routines. The subroutines fall into three general categories: 1. Index addressing, 2. Direct addressing, 3. Non-addressing.

Minimum Hardware:	4K PDP-8/E with EAE and TTY
Source Language:	PAL III

DECUS NO. 8-492

BINLOAD, BINTAPE, and SEARCH

William B. Wright
Submitted by: John W. Taylor, Bucks County Community College, Newtown, Pennsylvania

This program replaces the binary loader , DEC-08-LBAA-PM, and binary puncher, DEC-08-YX1A-PB. It can punch any or all of core and also contains a search routine for finding all occurrences of any 12-bit word in memory. A 12-instruction toggle-in bootstrap loader for the PDP-8/E for loading this routine is also offered.

Minimum Hardware:	4K PDP-8/E, TTY
Storage Requirement:	7600-7777
Restrictions:	For PDP-8/E only, but can be modified
Source Language:	PAL III

DECUS NO. 8-493

Line to Block Conversion

Ralf Beyer, DFVLR, Institut fuer Flugfuehrung, Flughafen, Germany

The program assumes k variables with n samples stored in k blocks of DECtape each containing n lines. Particular lines of one block correspond with the appropriate lines of other blocks. For data manipulation in particular in connection with DECUS NO. 8-137 "Program for Storage, Manipulation and Calculation of Data Using DECtape" the program converts the array of k blocks with n lines to an array of n blocks with k lines. Floating-point number representation is used and the size of the array may be k = 23 and n = 42 at maximum.

Minimum Hardware:	4K PDP-8, ASR33, TCØ1/TU55
Other Programs Needed:	DECUS NO. 8-137
Storage Requirement:	20-43; 200-1657; 1600-7577 (Data Buffer)
Source Language:	PAL-D

DECUS NO. 8-494

Translate Arabic Into Roman Numerals

A. Moses, Computer Applications Engineering Company, El Paso, Texas

This program translates Arabic numbers into Roman numerals. The number must be greater than 0 and less than 4000, otherwise the program will print "ENTER ARABIC NUMBER >0 & <4000" and start over.

The user enters an Arabic number followed by a terminator, such as SPACE. The program types the Roman numeral followed by a carriage return and line feed. The program is then ready to accept the next Arabic number.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	4K FORTRAN Compiler and Operating System (DEC-08-AFC1 and DEC-08-AFC3)
Source Language:	4K FORTRAN

DECUS NO. 8-495

CORRELATION ANALYSIS

Ralf Beyer, DFVLR, Institut fuer Flugfuehrung, Flughafen, Germany

This program is a patch to be used with the analysis of variance routine of DECUS NO. 8-137. After printing of the AOV-table it computes and prints F-ratios to determine the statistical significance of first and higher order correlations of the data samples.

Minimum Hardware:	4K PDP-8, ASR33, TC01/TU55
Other Programs Needed:	DECUS NO. 8-137
Restrictions:	Maximum number of blocks and lines on input reduced to 100_8 each
Source Language:	PAL-D

DECUS NO. 8-496

UTR7: A 7-track Magnetic Tape Reading Utility

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts
With overlay for TM8E Controller by H. E. Cronin, Naval Weapons Center, China Lake, California

UTR7 is a utility program designed to read and print selected records from 7-track magnetic tape, via the TC-58. Program inputs are: record length, parity, recording density, and data format. Available data format output options are: 6-bit ASCII (2 characters to a word), 8-bit ASCII, unsigned octal, unsigned decimal, unsigned hexadecimal, signed octal, signed decimal, binary and IBM 7-track tape BCDIC. The program is designed so that new options may be added easily.

Minimum Hardware:	PDP-8, ASR33, TC-58
Storage Requirement:	2343_8 locations plus tape record buffer storage
Source Language:	PAL-8

DECUS NO. 8-497A

8BAL - PDP-8 Macro Language, Version 4

David M. Kristol, Wilmington Delaware

8BAL is intended to be a general macro processor, suitable for use with PAL-8, FORTRAN, or any other language available in PS/8 which uses the system I/O structure. The program acts as a one pass "front end" to the "host" language processor, generating source code for the host language. Because 8BAL uses a special signal character ("@") that is illegal in the host language, 8BAL source code can be mixed with host language statements.

Minimum Hardware:	8K PDP-8 with mass storage device
Other Programs Needed:	PS/8-OS/8 Operating System
Miscellaneous	Will use available memory up to 16K for table storage
Source Language	PAL-8

DECUS NO. 8-497B

8BAL Source Documentation

David M. Kristol, Wilmington, Delaware

This document describes the internal workings of 8BAL from a programming standpoint.

The author wishes to point out that, while helpful, this documentation may not be absolutely accurate because it was written for an earlier version of 8BAL, not for the version currently distributed by DECUS.

DECUS NO. 8-498

Unencoded Incremental Plotter Subroutine

L. Papazian, CETIM, Senlis, France

This subroutine moves the pen of an unencoded plotter (Benson 110) to a new position along the best straight line. The pen can be raised or lowered during the motion.

All operations are controlled by JMS instructions. The accumulator does not specify the operation as in the Digital 8-12-U subroutine.

Minimum Hardware:	PDP-8/E, ASR33, Incremental Benson Plotter (model 110)
Restrictions:	Must be assembled with the main program
Source Language:	PAL III

DECUS NO. 8-499

High Speed Reader Patch for Lo Speed Macro-8

Michael K. Loukides, Hamden High School, Hamden, Connecticut

This patch changes MACRO-8's input subroutine for high speed input with all output on the ASR33. MACRO must be reloaded for low speed input.

Minimum Hardware:	PDP-8, ASR33, High speed reader
Other Programs Needed:	MACRO-8, low speed
Source Language:	PAL III

DECUS NO. 8-500

DUMP8

Charles R. Wardrop, Digital Equipment Corporation, Sunnyvale, California

This program provides an octal dump of one or more 256 word PS/8 blocks. It is device independent on both input and output by interaction with the PS/8 system. The command decoder is called for I/O specification.

Minimum Hardware:	Any PS/8 configuration
Other Programs Needed:	PS/8
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-501

Galactic Coordinates

A. Moses, Computer Applications Engineering Company, El Paso, Texas

This program consists of two parts: the first converts star positions from astronomical coordinates (right ascension and declination) to galactic coordinates (latitute and longitude); the other converts in the reverse direction.

Minimum Hardware: 4K PDP-8L, TTY
Other Programs Needed: 4K FORTRAN Compiler and Operating System (DEC-08-AFCO)
Source Language: 4K FORTRAN

DECUS NO. 8-502

Interrupt Duplicator for Binary Object Tapes

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The program copies absolute binary tapes (produced by PAL, MACRO, ODT, etc.) from any of three readers onto any one of three punches.

This routine will not copy SABR or other relocatable binaries.

Minimum Hardware: 4K PDP-8, one or more on-line TTYs; HSR/P optional
Source Language: PAL III

DECUS NO. 8-503

MACRO-8X: 8K Extended MACRO-8 Assembler

David J. Waks
Submitted by: Robert M. Supnik, Applied Data Research, Cambridge, Massachusetts

MACRO-8X is an improved and expanded version of MACRO-8. It is also a two-pass MACRO assembler which runs on any 8K (or larger) PDP-8 family computer equipped with a high speed reader punch. Its enhancements include a large symbol table, improved literal and off-page link processing, paginated output, a formatted memory allocation table, and a number of pseudo-operations, including VFD (variable field definitions), BANK, LIST UNLIST, LIT, LITBAS, LGM and NOLGM.

Minimum Hardware: 8K PDP-8, HSR/P, TTY
Miscellaneous: No sources available

DECUS NO. 8-504A

ESI (Engineering and Scientific Interpreter)

David J. Waks
Submitted by: Robert M. Supnik, Applied Data Research, Cambridge, Massachusetts

ESI is an interactive scientific language modeled on JOSS. Its features include: decimal arithmetic; two dimensional arrays, direct and indirect statements, free format I/O, extensive English language diagnostics, straightforward statement syntax (every statement is a complete English sentence), several built in functions. Overlays are included to add and remove three extended functions - SIN, COS, SQRT.

Minimum Hardware: 4K PDP-8
Source Language: MACRO-8X

DECUS NO. 8-504B

ESIX - Extended ESI

Robert Supnik, Applied Data Research, Cambridge, Massachusetts

ESIX is an extended and improved version of ESI which runs on any 8K or larger family computer. It offers all the features of regular ESI, plus the following additional features: five times more program and array storage, automatic pagination of output, built in extended functions (SIN, COS, EXP, SQRT, LOG, LN, ARCTAN), generalized exponentiation, compound statements and comment statements.

Minimum Hardware: 8K PDP-8
Source Language: MACRO-8X

DECUS NO. 8-504C

ESI Demonstration Programs

David J. Waks, Applied Data Research, Cambridge, Massachusetts

This package consists of several sample programs for the ESI system (DECUS NO. 8-504A) which demonstrate its use. These programs are: 1. Single Load Matrix Inversion, 2. Complex Multiplication, 3. Octal Sum, 4. Statistics, and 5a-b. Multi-load Matrix Inversion. A sixth example, Zero Sum Game Solver, can be found at the back of the ESIX Guide (DECUS NO. 8-504B).

Minimum Hardware: 4K PDP-8
Other Programs Needed: ESI (DECUS NO. 8-504A) or ESIX (DECUS NO. 8-504B)
Source Language: ESI

DECUS NO. 8-505

BIN-CBL Extended Memory Loader

Jan J. Mader, Brandeis University, Waltham, Massachusetts

This loader maintains all features of DECUS NO. 8-338 (automatic selection of either BIN or CBL format, etc.). In addition it recognizes the field designation characters on binary or CBL tape so that it allows one to load a program to any memory field,

Minimum Hardware: 4K PDP-8/E, TTY
Storage Requirement: One memory page (200 octal locations)
Restrictions: Low speed I/O devices only. PDP-8/E only
Source Language: PAL III

DECUS NO. 8-506

Load Areas

J. Fraser, University of Liverpool, Liverpool, England

Load Areas is a keyboard-oriented program for PDP-8 family computers. It produces a list of the core areas which a binary or read-in mode paper tape will occupy when loaded.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	0-1143, any field
Source Language:	Subset MACRO-8, Compatible with PAL-D

DECUS NO. 8-507

EEPP (Editor Even Parity Punch)

E. D. Shepherd, Plessey Company Limited, Ilford, Essex, England

This program is a modification to Editor to punch even parity ASCII on teletype and high speed punch. Non parity tapes read into editor can be punched out with even parity.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	Symbolic Editor (DEC-08-ESAC-PB)
Storage Requirement:	39_8 locations
Source Language:	PAL III

DECUS NO. 8-508a

TSUTIL - A Utility-Diagnostic Program for TSS-8

Paul M. Kinzelman, Carnegie-Mellon University, Washington, D. C.

TSUTIL is a utility-diagnostic program for an RF08 disk TSS-8 system and should be especially useful at installations where the monitor has been modified, or where the system is operated by persons unfamiliar with how TSS-8 works.

Minimum Hardware:	TSS-8
Source Language:	PAL-D

DECUS NO. 8-509

INTERRUPT-TEST

Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

The program was developed to detect and report spurious interrupts. If an interrupt occurs, the program tries to identify it according to a list of SKIP instructions, and to clear the interrupting flag with the appropriate CLEAR instruction. The program restores page Ø after use, in order that MAINDECS in core remain unaltered.

Minimum Hardware:	4K PDP-8
Storage Requirement:	07000-07577
Restrictions:	Runs in Field Ø only
Source Language:	PAL III, PAL-8

DECUS NO. 8-510

P8COR - Overlay for 8K PAL-D Assembler for 4K Disk Monitor System (DECUS NO. 8-333)

Arthur L. Pike, Tufts University, Medford, Massachusetts

P8COR is an overlay that permits most of the features of DECUS NO. 8-333 to work as a stand-alone program for 8K users when disk or DECtape are not available.

Minimum Hardware:	8K PDP-8/I with ASR33 (Can use HSR/P if available)
Other Programs Needed:	DECUS NO. 8-333
Source Language:	PAL III (Assembled with DECUS NO. 8-333)

DECUS NO. 8-511

FPAK-4 Interrupting Floating Point Package

Robert A. Belshe, University of California, Lawrence Radiation Laboratory, Berkeley, California

This is the DEC extended floating point package plus output controller with a number of useful modifications and additions. Memory required is one page greater than the standard DEC version, plus interrupt handler.

Only the binary tape and listing are distributed by DECUS. Users who wish to obtain a source card deck may send a blank magnetic tape to the author which he will return to them with the card images of FPAK-4 and the assembler, if needed.

Minimum Hardware:	4K PDP-5 or PDP-8 family, PDP-12
Miscellaneous:	EAE Not required
Source Language:	ASSM (An LRL assembly language similar to PAL)

DECUS NO. 8-512a

Modified Binary Loader

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

1) These loaders are "customized" for LSR (TTY) or HSR (PC8-E etc.) respectively.

2) Starting addresses are 7700 or 7777.

3) Certain checks are made on binary tapes as they are read in, in addition to checksum computation at the end. Errors trigger a JMP. rather than HLT and hence cannot be overlooked.

4) The loaders take less core than the standard DEC loader; in particular, 7750-7755 are left free for data break.

5) The tapes supplied are in a hybrid RIM/BIN format which loads in roughly half the normal time. Either RIM or BIN loaders will load these tapes.

6) The high speed version (HSRBIN) can be booted into core via a 9-instruction "Help" loader bootstrap.

Source Language:	PAL III

DECUS NO. 8-513

DEBUG 8

Michael S. Cole and C. W. Richardson
Submitted by: W. R. Myers, Aerojet Nuclear Company, Idaho Falls, Idaho

DEBUG 8 allows for opening and loading locations in core, execution of subroutines, insertion of breakpoints, restoring breakpoint instructions and beginning execution at a given location.

Minimum Hardware:	PDP-8, TTY
Other Programs Needed:	User Print - Input - Carriage Return - Line Feed Routines
Storage Requirement:	1 page (plus user routines)
Source Language:	PAL III

DECUS NO. 8-514

Alpha-Numeric Display Program

Ralph Norman Haber, University of Rochester, Rochester, New York

A program to display characters, along with a driver program written in FORTRAN, and a subroutine program for listening for button presses and recording reaction time in psychological experiments.

Minimum Hardware:	4K PDP-8, 34D Display or equivalent
Source Language:	PAL and FORTRAN

DECUS NO. 8-515

Program to Mate PAL III With Symbolic Editor

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program enables PAL III (in field Ø or 1) to read Symbolic Editor's text buffer directly (field 1 or Ø) without paper tape input to PAL. Editor and its storage areas are unmodified. PAL loses its low speed input routine but retains all other options.

Minimum Hardware:	8K PDP-8, TTY
Other Programs Needed:	PAL III; Symbolic Editor
Source Language:	PAL III

DECUS NO. 8-516

Self-Starting PS/8 Loader

F. J. Meijer, University of Amsterdam, Amsterdam, The Netherlands

This program produces on paper tape a self-starting PS/8 loader for the PDP-8/E with TD8-E DECtape

Minimum Hardware:	PDP-8/E with TD8-EM
Other Programs Needed:	PAL Assembler
Storage Requirement:	One Page
Source Language:	PAL

DECUS NO. 8-517

Bowling League Results, Standings and Averages Program

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program can be used to automate the weekly task of preparing bowling league results. It demonstrates the following OS/8 FORTRAN features: device independent I/O chaining and in-line SABR coding. Historical data is maintained for 128 bowlers and 16 teams.

Minimum Hardware:	8K PDP-8 with TCØ1 DECtape, HSR/P, LPØ8 Line Printer
Storage Requirement:	264_{10} OS/8 blocks
Source Language:	OS/8 FORTRAN

DECUS NO. 8-518

PS/8 FORTRAN Alphabetical Sort

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

This is an alphabetical sort of any number of fields of any width. The array to be sorted must be an integer array of ASCII characters stored in A2 format. The program is a subroutine and is called from the main program.

Minimum Hardware:	PS/8 System
Other Programs Needed:	PS/8
Source Language:	PS/8 FORTRAN

DECUS NO. 8-519

MACRO-8 Pass 3 Output Format Patch

Richard J. LaBella, Airborne Instruments Laboratory, Deer Park, New York

This patch will format the Pass 3 output on the teletype into page size blocks of either single sheets or fanfold paper.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	MACRO-8 (DEC-08-CMAB-PB)
Restrictions:	Reduces zero page literal buffer by approximately 25%
Source Language:	Machine Language

DECUS NO. 8-520

PEST/WALD/PINIT: Adaptive Psychophysics Testing Package

H. L. Kaplan, M. M. Taylor, C. D. Creelman, University of Toronto, Toronto, Canada

Three subroutines to run adaptive psychophysical testing using procedures developed by M. M. Taylor and C. D. Creelman

July 1974

DECUS NO. 8-520 (Continued)

(PEST: Efficient Estimates On Psychophysical Functions, Journal of the Acoustical Society of America, 1967, 41, 782-787) for rapid location of "threshold" stimulus values. Included is an extensive demonstration and testing package and some examples of using PEST.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	200_8 for main subroutines; 1000_8 for demonstration packages
Source Language:	PAL III

DECUS NO. 8-521

A CLOCK

Klaus Lickteig, Technische Universitaet Berlin, Berlin, Germany

This demonstration program will display a clock on the oscilloscope of an AXØ8 A/D converter. After setting the clock, the running clock will be displayed on the oscilloscope. There are possibilities to regulate the clock during running.

Minimum Hardware:	4K PDP-8, AXØ8 A/D Converter, ASR33
Storage Requirement:	Locations 0-2, 10, 20-57, 200-4347
Source Language:	PAL III

DECUS NO. 8-522

'PAGEIT'

William R. Anderson, Jr., Portsmouth Abbey School, Portsmouth, Rhode Island

'PAGEIT' is an overlay to PAL III which gives the user the option (Bit 8) to incorporate formatted listings in his first and third pass. Each listing is paged in unified length with page numbers (1-99). The user has control of an eject command which feeds to a new page. The user can also set the size of each page to his needs.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	PAL III
Storage Requirement:	200_8 locations
Restrictions:	Reduces PAL III Symbol Table from 576 to 544
Source Language:	PAL III

DECUS NO. 8-523

MDT - A Mini Debugging Technique

M. Zelkowitz, W. Christensen, L. Bourne, J. Dalton, W. Besore, Computer Science Center, University of Maryland, College Park, Maryland

MDT is a small debugging system that resides in the top page of core. It includes a binary loader, and routines that can dump core onto the teletype, modify core from the teletype and punch core in BIN format. It is designed to be quickly loaded at installations with no high speed I/O device.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7600-7777
Restrictions:	Uses slow speed I/O devices only
Source Language:	PAL III

DECUS NO. 8-524

GRNDYE 1970 - A Program to Estimate Cardiac Output Off-Line from an Indicator Dilution Curve

Jens G. Rosenkrantz, M. D. and John G. Parnevelas, M. S., Children's Hospital of Los Angeles, Los Angeles, California

An off-line program is presented which calculates cardiac output on a PDP-8 computer. It is usable in a paper tape or disk-monitor system. The program is sufficiently accurate, compared with hand calculations, to be useful to the laboratory measuring cardiac output by indicator dilution methods. It suffers from the limitations of the Stewart-Hamilton method itself.

Minimum Hardware:	4K PDP-8, HSR
Other Programs Needed:	Editor (DEC-Ø-ESAB); Floating Point Interpreter #4 (Digital-8-25-F)
Source Language:	PAL-8 (or PAL III)

DECUS NO. 8-525

DAFFT/PAFFT/DAQUAN (EAE)

Gerry Dulaney
Submitted by: Charles Romeo, Digital Equipment Corporation, Maynard, Massachusetts

DAFFT/PAFFT are overlays to DAQUAN (EAE) which support signal averaging in the time domain (up to 1024 double precision points), and FFT into frequency domain giving up to 1024 real and 1024 complex coefficients.

Minimum Hardware:	LAB 8/E (Advanced) with EAE
Source Language:	PAL-8

DECUS NO. 8-526

PROCAL 10/71

Peter G. Kretzman, Cold Spring Harbor High School, Huntington, New York

PROCAL 10/71 is a conversational symbolic logic programming system that uses the Lukasiewiczian notation and is especially oriented towards solving logical problems. Using the Special notation, the user may input his assumed premises and then see if his proposed conclusion is valid or invalid, based on those premises.

Minimum Hardware:	4K PDP-8, 8/I, 8/L or 8/E; ASR33

DECUS NO. 8-526 (Continued)

Storage Requirement:	0-1777, rest of core space if buffer and pushdown
Restrictions:	Six variables limit in logical expression
Source Language:	PAL-D

DECUS NO. 8-527

XDDT8E

Kincade N. Webb, Xenex Corporation, Waltham, Massachusetts

XDDT8E is an octal symbolic debugging program for the PDP-8E with Extended Memory which preserve the status of the program interrupt system at breakpoints. It is the result of updating XDDT (DECUS NO. 8-127) to make it operate correctly on the PDP-8E. It adds BIN and RIM punching and improves mnemonic typeouts.

Minimum Hardware:	PDP-8/E, TTY
Storage Requirement:	2K
Restrictions:	Not 8/I, 8/L compatible
Source Language:	PAL-10

DECUS NO. 8-528

TIC-TAC-TOE: Modifications to TIC 5/8, DECUS NO. 8-173

Klaus Lickteig, Technische Universitaet Berlin, Berlin, Germany

This modification to TIC 5/8 makes it possible to run TIC 5/8 on a LAB-8 System and to play TIC-TAC-TOE.

Minimum Hardware:	4K PDP-8/I or 8/E with AXØ8 A/D Converter and ASR33
Other Programs Needed:	TIC 5/8 (DECUS NO. 8-173)
Storage Requirement:	With TIC 5/8: 1-3, 33-3053
Source Language:	PAL III

DECUS NO. 8-529

OSCAR: An Operating System for Computerized Animal Research

Dennis Kuch and John Platt, McMaster University, Hamilton, Ontario, Canada

OSCAR is designed to control subject-environment interactions and to accumulate data in behavioral experimentation. Any number of experimental stations may be used, depending upon the user's application. Two to five pages of PAL programming are required from the user to determine particular experimental procedures and data manipulation while OSCAR handles all general functions of servicing the stations and interacting with the operator.

Minimum Hardware:	4K PDP-8, ASR33, experimental station interfaces, clock
Other Programs Needed:	Some program required from user for specific paradigms.
Storage Requirement:	4K (14 pages for system, the rest for storage as needed)
Miscellaneous:	RLYOUT, READ, and clock routines must be modified for different systems
Source Language:	PAL III

DECUS NO. 8-530

8BALIB - 8BAL Macro Library Generator

David M. Kristol, Wilmington, Delaware

8BALIB processes 8BAL (DECUS NO. 8-497A) source files and generates a macro library. The library may later be used by 8BAL to supply otherwise undefined macros to a source program.

Minimum Hardware:	PS/8 Configuration
Source Language:	PAL-8

DECUS NO. 8-531A&B

'TRIPLE' - 36 Bit PDP-8/E Simulator and 'TRIPLE' 8BAL Macros

David M. Kristol, Wilmington, Delaware

A) 'TRIPLE' gives the PDP-8 user a simple-to-use multiple precision capability. The triple precision routines are entered by a subroutine call, after which each computer word is interpreted as an instruction for a PDP-8/E with 36-bit operands. Most op codes (all memory references) are interpreted. Escape back to normal execution occurs via a HLT.

B) The 'TRIPLE' 8BAL Macros permit the coding of 36-bit constants and literals in a convenient way when using the 'TRIPLE' precision package. Included are numerical, symbolic and character literals.

Minimum Hardware:	PDP-8, 8/I, 8E, 8/L
Other Programs Needed:	None for A; PS/8 and DECUS NO. 8-497A for B.
Storage Requirement:	64ØØ - 7577
Source Language:	PAL-8

DECUS NO. 8-532

OPDDT (One Page DDT)

W. Friedman, Rockefeller University, New York, New York

This octal debugger may be run on any one page except zero. Like OPT it is controlled from the teletype. It sets a breakpoint, proceeds from one point to the next, examines and changes memory.

Minimum Hardware:	4K PDP-8, TTY
Storage Requirement:	One page of core plus location 5
Restrictions:	Cannot run on page zero
Source Language:	MACRO-8

DECUS NO. 8-533

"WHERE"

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Reads a binary tape and prints out the field and core areas which that tape will occupy when loaded.

Minimum Hardware:	4K PDP-8/E with console, TTY, Optional HSR
Other Programs Needed:	Binary Loader
Storage Requirement:	4400-4566 in any core field
Restrictions:	Will not run on 8/I or 8/L
Source Language:	PAL III

DECUS NO. 8-534

DUAL BINARY LOADER

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Used to load two binary tapes simultaneously into core.

Minimum Hardware:	8K PDP-8 with 2 TTY readers, device codes 03 and 40
Other Programs Needed:	Binary Loader
Storage Requirement:	4245-4575 in field 1. Start-14370
Restrictions:	Written for PDP-8/E; one patch needed for 8/I or 8/L
Source Language:	PAL III

DECUS NO. 8-535

BINARY PUNCH FOR PDP-8/E WITH 2 TTY's (or with high speed punch)

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Punches any number of blocks (the user need not count them) from any core fields of memory, with or without field pseudo-op codes. User and punch communicate via console keyboard. (no switch register settings).

Minimum Hardware:	4K PDP-8/E, Console keyboard and a punch not part of console keyboard
Other Programs Needed:	Binary Loader
Storage Requirement:	4000-4376, any core field
Restrictions:	8/E only
Miscellaneous:	Written for TTY punch, device code 41; patches (3) are given for High Speed Punch
Source Language:	PAL III

DECUS NO. 8-536

Advanced Averager Improvement

Dr. J. L. Blom, Laboratory Ergonomic Psychology, TNO, Amsterdam, The Netherlands

This is a series of listings for five overlays to use the Advanced Averager program under the PS/8 monitor system on the LAB-8/I. Added is a sixth part (on paper tape) which writes the calculated data to any of the output devices under the PS/8 system.

Minimum Hardware:	LAB-8/I with 8K core; 2 DECtapes
Other Programs Needed:	PS/8 Monitor System, Advanced Averager (DEC-LB-U17C-PB)
Restrictions:	Runs only on 8K
Source Language:	PAL-D

DECUS NO. 8-537

Talking Eights

Louise Gerhart, Digital Equipment Corporation, Maynard, Massachusetts

This program transmits and receives synchronous messages between two PDP-8/Es. Messages are entered via teletype so that operators at remote points may hold a "conversation."

Minimum Hardware:	2 PDP-8/Es equipped with 4K core, DP8E Synchronous Interface Modems and Lines
Storage Requirement:	4K
Source Language:	PAL-8

DECUS NO. 8-538

Integer IOH for FORTRAN Library

Ronald C. Barrett, Northwestern University, Evanston, Illinois

INTIOH is for use with FORTRAN programs having only integer arithmetic, and is a substitute for the format interpreting routine of the PS/8 FORTRAN library. Eight pages of core are saved. A new format is defined for input of file names used in device independent input/output and chaining.

Minimum Hardware:	8K PDP-8 or PDP-12, Disk or DECtape
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	6 pages - 1400_8 words
Source Language:	SABR

DECUS NO. 8-539

TD8E 4K Loader

Mark G. Roberts, Digital Equipment Corporation, Albuquerque, New Mexico

This package contains a one-page handler to load from TD8E

DECUS NO. 8-539 (Continued)

DECtape and a program to load paper tape onto DECtape. It will load everything except last page of memory; requires two passes of paper tape.

Minimum Hardware:	4K PDP-8/E, TD8E DECtapes
Other Programs Needed:	Binary Loader; TD8E DECtape Subroutine
Restrictions:	Only works in 4K of memory
Source Language:	PAL III

DECUS NO. 8-540A

BRAILLE-8

Richard Rubinstein, University of California, Irvine, California

BRAILLE-8 enables a blind time-sharing user to use a remote computer interactively with output in Braille. Connection to the remote machine is via an EIA-compatible line which may be hardwired or used with an acoustic coupler. BRAILLE-8 translates characters and buffers output to the (easily modified) console teletype.

A complete one-cell Braille representation of the standard teletype character set is used, and Braille output codes may be modified easily by the table changes if the user so desires. Available switch options: Full/half duplex; Hold output; Flush buffer.

Minimum Hardware:	PDP-8/E, 4K, Bootstrap loader, ASR33 (with Braille modification), KL8EX EIA interface
Restrictions:	Uses core occupied by bootstrap loader
Miscellaneous:	Contact DEC Computer Special Systems for teletype modification information
Source Language:	PAL-8

DECUS NO. 8-540B

BPRINT

Richard Rubinstein, University of California, Irvine, California

BPRINT is a subroutine which enables a user's main program to emboss Braille on a modified ASR33 teletype. A complete one-cell Braille representation of the standard teletype character set is used, and Braille output codes may be modified easily if the user so desires.

Minimum Hardware:	4K PDP-8, ASR33 (with Braille modification)
Other Programs Needed:	Main user program
Storage Requirement:	One page
Restrictions:	User's program must initialize teleprinter flag
Miscellaneous:	Contact DEC Computer Special Systems for teletype modification information
Source Language:	PAL-8

DECUS NO. 8-541

Cassette Utility Program and PALC

E. Della Torre and J. Roitman, McMaster University, Hamilton, Ontario, Canada

The Cassette Utility Programs are a group of programs designed to help in the preparation of programs for the PDP-8 computer. They consist of an Editor program, two tabulator programs, a page format program, a binary duplicator and a binary tape assembler and disassembler which are described in full in the write-up, PALC is a version of PAL III using cassette recorders.

Minimum Hardware:	PDP-8, 4K, TTY, Two (Compucorder) Cassette recorders; High Speed Reader and/or Punch are desirable.

DECUS NO. 8-542

Radioactive Decay

A. L. Al-Nuaimi, Ontario Hydro, Pickering G. S., Pickering, Ontario, Canada

This program solves the radioactive decay equation:

$$A = A_o e^{-\lambda t}, \quad A = (A\emptyset)*EXP(-DT)$$

for any one of the four variables:

A= activity after decay
AØ=activity before decay=original activity
TH=half-life of the radioisotope
T=time of decay, where:
D= the decay constant (λ)= .69315/TH.

Minimum Hardware:	PDP-8/I, 4K, Disk
Other Programs Needed:	Disk Monitor and FORTRAN-D Operating Systems
Restrictions:	Teletype Input-Output only
Miscellaneous:	After completing a set of computations, program restarts itself
Source Language:	FORTRAN-D

DECUS NO. 8-543

TS8REV - Reverse Assembler for TSS/8

William Harts, Dix Hills, New York

This program is an adaptation of DECUS NO. 8-178, Reverse Assembler, which has been modified to run on a standard TSS/8 computer. It will provide PAL mnemonics from any RIM, BINARY or SAVE format tape. This can be very useful in debugging a program when the user does not have a symbolic listing.

DECUS NO. 8-543 (Continued)

Minimum Hardware:	TSS/8
Storage Requirement:	15 TSS/8 Disk Segments
Restrictions:	HSR input and TTY output only
Miscellaneous:	Tape offered is TSS/8 SAVE format
Source Language:	PAL-D

DECUS NO. 8-544

CHECK and CHANGE-D

Benjamin C. Woodbury, Holden, Massachusetts

CHECK and CHANGE-D is an octal debugging program. Its advantage over DEC's DDT is that it loses no locations of core. It takes advantage of Monitor's scratch blocks, and automatic input-output block reading into core. CHECK and CHANGE-D stores its master controller in this place, reads specific blocks over itself, and uses 7200-7377 for a scratch page. When finished it restores block 2.

Minimum Hardware:	4K PDP-8, at least one disk unit, ASR33
Other Programs Needed:	DEC's Monitor System
Source Language:	PAL-D

DECUS NO. 8-545

PIF (Program Interrupt Facility for 3 TTY's)

Gary R. Garber, Laurence High School North, Trenton, New Jersey

This is a one page utility or demonstration program that recognizes CR/LF and CTRL/TAB on an interrupt basis. It was originally designed to facilitate easier typing of programs, but can be expanded to almost any use on an interrupt basis.

Minimum Hardware:	4K PDP-8, 1 to 3 TTY's
Source Language:	PAL III

DECUS NO. 8-546

DETEF - DECtape File-Handling System

Dr. Carl Reutersward, Research Institute of National Defense, Sundbyberg, Sweden

The DETEF system comprises:

1. A keyboard monitor similar to the Disk/DECtape Monitor, but better suited to tape operation. Programs are loaded, saved and recalled as named files made up of sequences of contiguous blocks. Files of many type-designations may be allocated and deleted by monitor commands. The resident DECtape handler operates in the continuous mode (core locations, not pages, are specified).

2. Utility programs for reading file directory, for packing and copying files, etc.

3. A modification of FOCAL W: Segmented program and data files accessed by programmed saving and loading operations; variables not erased by loading of programs; two data buffers for economic storage of floating point numbers and 12-bit integers.

4. An adaption of EDIT: DECtape files for input and output; multiple inputs; input used for output; listing of line numbers.

5. An adaption of PALD: control of extent of assembly listing; symbol table expansion through storage on DECtape.

Minimum Hardware:	4K PDP-8/I, EAE, TC01, one TU55; Optional: HSR/P, 32K, eight TU55's, AX08
Storage Requirement:	7600 to 7777 (Monitor loader and DECtape handler)

DECUS NO. 8-547

Advanced Averager Program (Rotterdam Version)

L.T.M.E. Hillegers and S. Miller, Medical Faculty, Department of Anatomy, Rotterdam, The Netherlands

This is a modification of the LAB-8 Advanced Averager Program (Paper Tape Version C. DEC-LB-U17/18C-LA) for one-pass loading of Sections III, IV and V, including additional functions used in neurophysiological research (oscilloscope display of reflex conditioning curves).

Minimum Hardware:	4K PDP-8/L, AX08 Laboratory Peripheral, TTY, Oscilloscope
Other Programs Needed:	RIM and BIN Loaders

DECUS NO. 8-548

Links to Page Routine

Leendert Paul Geffen, Data Research Associates, Wayland, Massachusetts

Provides convenient numbered pages in Pass 3 listing of assemblers, and for output of Reverse Assembler, without the necessity of punching tape and reading it again through the Page Routine. With MACRO-8, output will halt after body of the listing, and "Continue" must be pressed to get symbol table. Assembler links are furnished in two versions each, with main program in either field 1 or field Ø.

Minimum Hardware:	8K PDP-8, ASR33 (4K for Reverse Assembler)
Other Programs Needed:	DECUS NO. 8-184 reassembled @ *6000 (BIN tape of this is included with BIN tape offered); Either DECUS NO. 8-178, Reverse Assembler DEC-08-ASCI-PB, PAL III, or DEC-08-CMAB-PB MACRO-8, High and Low speed combined as the case may be
Source Language:	PAL

DECUS NO. 8-549

Polynomial Least Squares Fit

Guy R. Sherwood, Edward Hines, Jr. V. A. Hospital, Hines, Illinois

This program works on the least squares principle and calculates the coefficients for a polynomial equation. It allows for up to 12 different degree equations. It also allows for up to 12 values of X, F(X), and the weight of each value to be entered. The program permits up to 3 values of F(X) for each X to be entered. The maximum degree this program can fit depends on the data.

Minimum Hardware:	8K PDP-8/I, TTY
Source Language:	PS/8 FORTRAN

DECUS NO. 8-550

Modified Matrix Inversion -Real Numbers

John W. Horm, University of Pittsburgh, Pittsburgh, Pennsylvania

This is similar to "Matrix Inversion - Real Numbers" (DECUS NO. 8-72) by Professor A. E. Sapega. It has been modified to run under PS/8. Input is from the high speed paper tape reader and the output is routed to the DECwriter with the option of having a paper tape made of the inverse.

Minimum Hardware:	PS/8 System, High Speed Paper Tape Reader, Punch (optional)
Storage Requirement:	8K Minimum
Source Language:	PS/8 FORTRAN

DECUS NO. 8-551

COMBO

William R. Anderson, Jr. 2700 Virginia Avenue, N. W., Washington, D. C.

COMBO was developed to give the 8K user of PAL III the ability to call up PAL from the Editor. The user can lock the panel, and with the Switch Register and keyboard, call up PAL and transfer Editor's buffer to PAL without the use of lengthy paper tape operations.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	BIN Loader, PAL III, Symbol Editor
Source Language:	PAL III

DECUS NO. 8-552

Storage Display Device Handler

Robert Moore, TROPEL, Inc., Fairport, New York

This program permits use of the Storage Scope as a line printer. A TTY key is hit to display the next page. (Pages are delimited by Form Feeds.) TABS are not expanded. Program runs in PS/8 or OS/8 wherever 2 page handlers are permitted.

Minimum Hardware:	PDP-8/I or 8/E with EAE, or PDP-8/E, 8/M or 8/E, Point plot display controller VC8E, 340, or VC8I; Storage Oscilloscope
Other Programs Needed:	PS/8 System
Source Language:	PAL-8

DECUS NO. 8-553

Big Brother II

Gary Garber, Laurence High School, Trenton, New Jersey

Big Brother II allows a program written in modified assembler language to be assembled in one pass and checked for errors. The program is then loaded automatically into the allotted section of core where it is executed automatically. Upon completion of the program control is transferred to Big Brother for debugging, editing or tape punching. The language is very similar to PAL III with a few formatting changes. It is at least 10 times faster than the normal assembly procedures. This program is essentially the first step toward a totally complete compiler and is very important when time is a factor. Big Brother is self-starting once the RIM has been loaded and has options for high or low speed input of ASCII tapes.

Minimum Hardware:	8K PDP-8, ASR33, High or Low Speed Reader, Memory Quotient Register
Restrictions:	Program length is limited to some extent. Program can destroy itself if format is not followed.
Source Language:	PAL III

DECUS NO. 8-554

ANOVA and DUNCAN

Marjorie H. Kleinman, Center for Community Research, New York, New York

ANOVA - Analysis of variance on up to 64 treatment groups. Missing data is permitted. Will compute and print out for each group the number of subjects, mean, standard deviation. T tests are performed between all possible pairs. Also, there is an option for calling DUNCAN multiple range program.

Minimum Hardware:	8K PDP-8/I, TTY, printer, disk or DECtape
Other Programs Needed:	PS/8 Operating System
Source Language:	FORTRAN

DECUS NO. 8-555

MULTC Multiple Correlation Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

Based upon Doolittle's method for solving simultaneous equa-

DECUS NO. 8-555 (Continued)

tions for the unknown B's. The maximum number of variables, including the dependent variable, is 8.

Minimum Hardware: 8K PDP-8 with TTY, printer and 1 DECtape or disk
Other Programs Needed: PS/8 Operating System
Source Language: FORTRAN

DECUS NO. 8-556

CHISQ Chi Square Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

Will compute up to 20 chi squares at a time on tables as large as 8 X 9. Missing data is permitted. Tables need not all be the same size for the same run. Items may have different ranges. There is an option for computing the contingency coefficient for each table.

Minimum Hardware: 8K PDP-8/I with TTY, printer and disk or DECtape
Other Programs Needed: PS/8 Operating System
Source Language: FORTRAN

DECUS NO. 8-557

CLUSTR Cluster Analysis Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

This program is based on hierarchical grouping, as described in FORTRAN PROGRAMMING FOR THE BEHAVIORAL SCIENCES, by Donald J. Veldman, and is adapted from the program provided in that book.

Minimum Hardware: 8K PDP-8, TTY, printer, 1 DECtape or disk
Other Programs Needed: PS/8 Operating System
Source Language: FORTRAN

DECUS NO. 8-558

CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program

Marjorie H. Kleinman, Center for Community Research, New York, New York

CORREL will compute Pearson product moment correlations on a matrix of variables as large as 80 X 80. Missing data is permitted. Before computing correlation coefficients, the appropriate means are substituted for any missing values.

PCOMP-VARMX uses the principal components method of extracting roots and vectors, and then performs varimax rotation on the factor loading matrix. Input is in the form of a square correlation matrix, and can be read from any input device. Output from CORREL may be used directly as input.

Minimum Hardware: 8K PDP-8/I with teletype, printer, 1 DF 32 disk, and 1 DECtape
Other Programs Needed: PS/8 Operating System
Miscellaneous: Intermediate data are stored on 2 devices, which are ASSIGNED
Source Language: FORTRAN

DECUS NO. 8-559

CUBIC - A Digital Program for On-Line Differentiation of Sample Analog Signals

John H. J. Allum, Man-Vehicle Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts

A digital computer program CUBIC has been developed for on-line differentiation of analog voltage signals. The program accepts voltage records of a time function and yields its derivative after one program cycle time of 4.2 msecs. The velocity is obtained by employing a least mean squares cubic fit technique.

The routine is intended for experimental work either as a data reduction tool or as a control signal for a closed loop experiment. The program can be implemented on a PDP-8 digital computer with one digital to analog converter channel and one analog to digital converter channel.

Minimum Hardware: PDP-8, 1 A/D and 1 D/A channel
Storage Requirement: 2K
Miscellaneous: This work was supported in part by NASA Grant NGR-22-009-025
Source Language: PAL

DECUS NO. 8-560

SAM-1

Robert L. T. Cronin, Belmont Hill School, Belmont, Massachusetts

SAM-1 is a Morse Code sending program designed to operate without D/A hardware. It utilizes the electromagnetic force emitted by core to interfere with a radio transmitter located up to 20 feet from the computer. Sending rate is variable via a SR setting. The higher the setting, the faster the rate.

Source Language: PAL III

DECUS NO. 8-561

Revised HELP Loader for High Speed Reader and New BIN Loader

Frank Palmisano, 7 Brentwood Road, Hazlet, New Jersey

Through the use of auto-indexing, interrupt, and a minimum of other commands, the HELP loader has been shortened to seven steps, making it quicker to initialize the system.

The BIN loader has been reduced from 143_8 locations to 100_8 locations, allowing room for the TC01 bootstrap and leaving the data break locations open.

DECUS NO. 8-561 (Continued)

Minimum Hardware: 4K PDP-8, HSR
Other Programs Needed: RIM Loader
Restrictions: Must be loaded in field zero. Uses Interrupt
Source Language: PAL

DECUS NO. 8-562

DISORT

John Alderman, Digital Communications Associates, Inc., Atlanta, Georgia

This is a program to produce alphabetically ordered directory listings for PS/8. With minor patches it can be used to sort any ASCII file under PS/8.

Minimum Hardware: PS/8 Configuration
Other Programs Needed: PS/8 or OS/8 Operating System
Source Language: PAL-8

DECUS NO. 8-563

TAPE

Russell Lyons, 8 Gould Road, Lexington, Massachusetts

Punches readable characters on paper tape using the low speed punch. It can punch all characters from 240 to 337 (ASCII).

Minimum Hardware: TSS/8, ASR33
Source Language: PAL-D

DECUS NO. 8-564

A Statistical System in PS/8

Jens G. Rosenkrantz, M. D., Childrens Hospital of Los Angeles, Los Angeles, California

A system, built upon DEC's PS/8, which runs a number of programs to do statistical analyses of data. The following programs are provided: (1) Mean-Variance; (2) Student's t Test; (3) Rank Analysis; (4) Analysis of Variance; (5) Correlation; and (6) Chi Square. Additional programs can be easily added to the system.

Data may be given from a variety of input devices. Answers may be written, on the teletype, high speed punch or line printer, and are formatted on 11 inch "pages." A large number of data files may be chained together by the user, in order to permit batching of data, each file calling a particular statistical test. Thus the system can function as a desk calculator (with teletype input) or can process large batches of data unattended.

Minimum Hardware: 8K PDP-8, Disk or DECtape
Other Programs Needed: 8K FORTRAN System
Restrictions: Output limited on most programs
Source Language: PS/8 FORTRAN (FORTRAN II)

DECUS NO. 8-565

RENUM - Renumbering Program for BASIC Tapes

Dom Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

Designed to resequence an Edu-20 BASIC tape so that all line numbers are multiples of (decimal) 10. The first line number in the new version is line 100. Commands which reference line numbers (THEN, GOTO, GOSUB) are readdressed to conform to the new numbering.

Minimum Hardware: 8K PDP-8E, F or M, ASR33 or PT8E high speed reader/punch
Source Language: PAL III

DECUS NO. 8-566

PARTL

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Program to evaluate the partial fraction expansion of a rational function N(s)/D(s), that has real coefficients and D(s) are written in linear or quadratic factors. Samples of control system reduction to its "Foster Form" canonical form, and network synthesis are given.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-567

EXPO

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Evaluates the approximate exponential expansion of the transition matrix or its augmented matrix, exp (AT) where A is a square matrix and T is a sampling period, which usually appear in the state variable approach to engineering problems, $\dot{x}(nT)=x(0)$.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K SABR Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-568

CFI - Continued Fraction Inversion

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

Program to convert a real continued fraction into a rational function.

DECUS NO. 8-568 (Continued)

A sample of evaluating electric network transfer function is given.

Minimum Hardware: 8K PDP-8/I, ASR33, HSR/P
Other Programs Needed: 8K FORTRAN Compiler, 8K SABR Assembler, 8K Linking Loader, User's Program
Source Language: 8K FORTRAN

DECUS NO. 8-569

FLIT Assembler

Gary R. Smith
Submitted by: George E. Ott, University of Wisconsin, Madison, Wisconsin

The FLIT Assembler produces a binary object tape on a high speed paper tape punch and a listing on a 33 ASR teletype from PDP-8 assembly language source tape read on a high speed reader.

FLIT has the following major advantages over other assemblers: 1. Literals and off-page linkages are automatically generated. 2. The source tape is read rapidly and reliably, reducing assembly time. 3. Line numbers appear on the listing, simplifying use of the Symbolic Editor. 4. Tabulations become 8-space fields in the listing just as with the Symbolic Editor. 5. The symbol table has room for at least 348_{10} user symbols.

FLIT does not recognize macros, floating point or double precision numbers, or Boolean operators. A few other minor source language differences exist between FLIT and other assemblers.

Minimum Hardware: 4K PDP-8, ASR33, HSR/P
Source Language: MACRO

DECUS NO. 8-570

BIN4SV

Roger Kuykendall, Electro Scientific Industries, Portland, Oregon

This program converts PS/8 - OS/8 saved files into binary files which may be stored in PS/8 - OS/8 binary format or output as binary on non-file-oriented devices (especially the paper tape punch).

Minimum Hardware: 8K PDP-8 mass storage device
Other Programs Needed: PS/8 or OS/8
Source Language: PAL-8

DECUS NO. 8-571

INPUT, OS/8 Version

Lars Palmer, Ph.D., AB Hassle, Molndal 1, Sweden

This is INPUT (DECUS NO. 8-480a) rewritten to function better under OS/8. All OS/8 devices can be read. This version will not function with paper tape FORTRAN II. A data file can be constructed with EDIT and read by FORTRAN.

Minimum Hardware: OS/8 Configuration
Other Programs Needed: 8K FORTRAN
Source Language: SABR

DECUS NO. 8-572

Combination Lettering and Duplicator-Coder Program

Ronald A. Wong, Edmund Wong Co., San Francisco, California

This program enables labeling and duplication of paper tapes in BIN or RIM format. The label is punched directly onto the copy tape and duplication can begin immediately. The input and output devices are selected automatically. Input and output can be from either high or low speed devices.

This program was written by modifying DECUS NO. 8-366 (by A. T. Siy) and DECUS NO. 8-181 (by M. A. Robinton).

Minimum Hardware: 4K PDP-8 with TTY, HSR/P optional
Restrictions: Cannot duplicate ASCII tapes on line
Source Language: PAL III

DECUS NO. 8-573

EDITS - A PS/8 Editor for Non-storage Scope Display

Ray Smith, M.I.T. Laboratory for Nuclear Science, Cambridge, Massachusetts

EDITS is a modified version of the PS/8 editor. EDITS displays a portion of the text buffer surrounding the current line. A couple of command changes have been made to facilitate its use with the display. The source can easily be reassembled to allow for different character generator hardware or software. EDITS displays line numbers if desired.

The tape includes a variety of display based software. Among the routines included is ZIP8 which: (a) Allows the PDP-8/I system to function as a remote PDP-10 terminal through the teletype console; (b) Runs with DECTAP/PA and TYPEDT.PA; (c) Allows PS/8 DECtape/PDP-10 text transmission in both directions; (d) Displays PDP-10 output on the CRT scope, if activated.

Minimum Hardware: PS/8 System, EAE, VC8/I
Other Programs Needed: PS/8 (will probably work with OS/8)
Storage Requirement: 8K
Restrictions: This program was intended for, and is used with, a hardware character generator. With the supplied software generation, the flicker is much worse
Source Language: PAL-8

DECUS NO. 8-574

TD8E System Handler for 8K PS/8

Harold T. Salive and Kim D. Ng, University of Auckland, Auckland, New Zealand

The programs permit running of PS/8 with the TD8E control and only 8K of core. ROM is not necessary with this program. A load-and-go system handler is included which makes restarting easy while preserving the user region of core. A second program included patches the system to remove the AS and DE commands and some device names. A listing is provided for a single-drive DECtape copy routine.

Minimum Hardware: 8K PDP-8, TD8E
Other Programs Needed: PS/8
Restrictions: Shouldn't use AS, De, or unit DTA1. Vulnerable to ODT. No checksum
Source Language: PAL-8

DECUS NO. 8-575

EAE Overlay for Four-Word Floating Point Package Multiply

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts

This overlay allows the Four-Word Floating Point Package (DEC-08-FMHA-D) to use an EAE in multiplication, thus decreasing the time to interpret an FMPY by a factor of 5.

Minimum Hardware: PDP-8, EAE
Other Programs Needed: DEC-08-FMHA-D
Source Language: PAL-8

DECUS NO. 8-576

LOCAL PAL8: LPAL8.SV

Harold T. Salive and Kim D. Ng, University of Auckland, Auckland, New Zealand

This program allows simple construction of a local PAL-8 having a permanent symbol table tailor-made for a local installation. A program changing symbol table is run through pass 1 of PAL-8. Then the constructor program is run. The constructor program uses the just completed pass 1 symbol table to replace the standard PAL-8 symbol table. The new local version is then saved by the program on SYS as LPAL8.SV.

Minimum Hardware: PDP-8, HSR
Other Programs Needed: PS/8, PAL-8
Source Language: PAL-8

DECUS NO. 8-577a

Paper Tape Duplicator (P.D.T.)

Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

A simpler (modified) version of the Master Tape Duplicator which does not use the interrupt facility.

Minimum Hardware: PDP-8 series processor, high speed paper tape reader and punch can be modified for low speed
Source Language: PAL III

DECUS NO. 8-578

Chromaticity Diagram

R. Jacot, Integra A. G., Wallisellen, Switzerland

From 40 measured data of the spectral transmittance of a material, the program computes and prints the coordinates in the chromaticity diagram and the transmittance for the colour temperatures 2854°K (C.I.E. standard source A) and for 2360°K.

Minimum Hardware: 4K PDP-8, TTY
Other Programs Needed: Floating Point Package 1 (DEC-08-YQ1B-PB) 4/17/70
Source Language: PAL III

DECUS NO. 8-579

LISTIT

Geoffrey Chase, O.S.B., Portsmouth Abbey School, Portsmouth, Rhode Island

LISTIT reads an ASCII paper tape, either 7 or 8-level code, and prints its contents on the console TTY or DECwriter, restoring tabs and ejecting pages in uniform length.

Minimum Hardware: PDP-8/E (F, M), TTY or DECwriter, paper tape reader
Source Language: PAL III

DECUS NO. 8-580

Decimal to Floating Point Conversion

R. Jacot, Integra A. G., Wallisellen, Switzerland

If a lot of data in floating point format are required, this program can be used to generate a complete source tape of the data in floating point format after they have been typed in decimal form. The generated tape can be assembled independent of the main program.

Minimum Hardware: 4K PDP-8, TTY
Other Programs Needed: Floating Point Package 1 or 2 (DEC-08-YQ1B-PB or DEC-08-YQ2B) 4/17/70
Restrictions: Runs only on low speed punch
Source Language: PAL III

DECUS NO. 8-581

Obsolete

DECUS NO. 8-597 (Continued)

12. Double Precision Arithmetic Package for OS/8 FORTRAN II
March 13, 1972 - Revised: December 4, 1972

DPARITH.FT is a fast double precision integer arithmetic internal SABR type code subroutine package for use in OS/8 FORTRAN II. This package will work on any PDP-8 with or without EAE. DPCVT.FT is a FORTRAN II subroutine using DPARITH.FT to convert double precision integers to and from floating point numbers.

Other Programs Needed:	OS/8 FORTRAN II/SABR
Restrictions:	All calls to DPARITH.FT must be inside of a subroutine or main with which it is compiled
Source Language:	OS/8 FORTRAN II/SABR

13. An OS/8 FORTRAN II Function to do BCD/Decimal Number Conversion
July 6, 1972 - Revised: December 4, 1972

IBCD packs or unpacks a BCD word (3 4-bitbytes) from or to a FORTRAN integer. The word to be packed or unpacked is given in argument "I" while the result is returned in "IBCD."

Restrictions:	Converts BCD numbers in the range of 0 to 999
Source Language:	OS/8 FORTRAN II/SABR

14. DICOMED 31 Image Display Device Handler
December 5, 1972

OS/8 subroutine "DIOMED" is a FORTRAN/SABR subroutine. It displays the point, 256X256, or 1Ø24X1Ø24 raster image on the DICOMED model 31 image display as well as doing other DICOMED commands such as ERASE, CHANGE GAMMA, TURN ON VIEW LIGHT, etc.

Minimum Hardware:	DICOMED 31 display and interface, EAE
Other Programs Needed:	OS/8 FORTRAN MAIN program
Restrictions:	Arrays are passed to DIOMED through COMMON
Source Language:	FORTRAN II/SABR

15. Program to Put a LINC8 Block 0 Bootstrap to Bring in the OS/8 System Disk
January 16, 1971 - Revised: December 5, 1972

TAPBOT writes a bootstrap block on block Ø of a unit Ø LINC8 128 word/block LINCtape which is being used as an OS/8 DECtape. The LINC load switch may then be used to bootstrap in the system device which in this case is an RFØ8 disk. It should also work with minor modification for other types of disks such as the DF32 or RK8.

Minimum Hardware:	LINC8 with at least one LINCtape drive and a disk
Restrictions:	OS/8 running on a LINC8 uses some device other than LINCtape as device SYS:
Source Language:	PAL-8

16. DATE - FORTRAN II OS/8 Subroutine to Return the OS/8 Date
November 8, 1971 - Revised: December 5, 1972

"DATE" returns the OS/8 date word in integer format. The algorithm for this FORTRAN callable subroutine was borrowed from the PS/8 system support manual.

Restrictions:	Requires OS/8 date word to be previously entered
Source Language:	OS/8 FORTRAN II/SABR

17. PTØ8/Datapoint 3300 PS/8 Build Programs
December 5, 1972

Five core images modified from the original version of November 1969 PS/8 software let the user build and run a PS/8 system with a PTØ8 as the system teletype. Used at 12ØØ or 24ØØ baud with a datapoint or similar terminal, PS/8 can be run with a much greater throughput.

Minimum Hardware:	PTØ8 serial interface (device codes 40/41
Other Programs Needed:	Existing PS/8 or OS/8 system
Restrictions:	The PS/8 core image has CONFIG set for a 4 platter RFØ8. To change this, another configuration .BN image from CONFIG must be used
Source Language:	ODT patched core images

DECUS NO. 8-598

CRT: An OS/8 Handler for Tektronix 611 Storage Scope

Donald C. Uber, Bio-Medical Division, Lawrence Livermore Laboratory, Livermore, California

CRT: is a two-page, write only, non file-structured device handler for the Tektronix 611 storage scope under the OS/8 operating system. The handler is listed in BUILD format for easy addition to an OS/8 system.

Minimum Hardware:	Tektronix 611 Storage Scope and PDP-8 Interface
Restrictions:	Non-standard interface required - is described in write-up
Source Language:	PAL-8

DECUS NO. 8-599

DIBILD.; Directory Rebuilder for PS/8 or OS/8

John Alderman, Digital Communications Associates, Inc., Atlanta, Georgia

DIBILD is a PS/8 or OS/8 utility program to restore directories that have been overwritten. It processes an ASCII file that is produced by PIP in the /E format (or a file that looks like this), and constructs a directory on the specified output device. The user supplies the program with the device code for the directory that is to be constructed, and the input file name (.DI is assumed). The "systems area" of the output specifiea device is protected since files will start at block 70(8). This feature can be changed by a simple patch to the source and reassembly.

July 1974

Please note that this program is offered with no promise that it is foolproof. Support for the program is not offered, and you use it at your own risk.

Minimum Hardware: PS/8 directory device and at least one other device

DECUS NO. 8-604 (Continued)

is useful when the user wants to toggle a patch into a system program before executing that program.

Minimum Hardware: 4K PDP-8, DF32 Disk or RF08 Disk or TC01 DECtape
Other Programs Needed: Disk Monitor System (DEC-08-SBAF-PB)
Restrictions: Actual system will recognize both Disk and DECtape but GETSYS will only operate on the system device.
Source Language: PAL-D

DECUS NO. 8-605

ADUMP8

Bruno Nicoletta and G. Franco Ruffini, Digital Electronic Automation, Moncalieri, Italy

This program provides a means of punching information contained in selected blocks of any core memory field, as binary coded paper tape using the high speed or TTY punch.

Minimum Hardware: 4K PDP-8, TTY or high speed punch
Source Language: PAL III

DECUS NO. 8-606

PIP11

Steven Williamson, Carleton College, Northfield, Minnesota

PIP11 allows a PS/8 user to read and write on DECtapes formatted and initialized for either DOS or RSTS, the two most commonly used systems on the PDP-11. Additional options allowing the output of data from an 11 DECtape to a DECtape that can be used by TSS/8 BASIC are also available.

Minimum Hardware: 8K PDP-8, EAE, 1 DECtape drive (2 preferable)
Other Programs Needed: PS/8 system
Source Language: PAL-8

DECUS NO. 8-607

CALCU1

J. V. Hopson, Bureau of Customs, 2100 K Street N. W., Washington, D. C.

Makes the PDP-8 perform like a printing calculator, with addition, subtraction, multiplication, division, and exponentiation. Prints out subtotals and totals on command. Recognizes control/C for return to monitor. Utilizes one of the DEC floating point packages (EAE--if so equipped, NON-EAE, or 27-BIT). Introductory dialog gives essential operating instructions.

Minimum Hardware: PDP-8, TTY
Other Programs Needed: Floating Point Package (EAE, NON-EAE or 27- BIT)
Source Language: PAL-8

DECUS NO. 8-608

FUTIL - OS/8 File Utility

Jim Crapuchettes, Department of Anesthesis, Stanford Medical Center, and Frelan Associates, Menlo Park, California

This program allows examination and modification of OS/8 (PS/8) mass storage devices from the teletype. A wide variety of commands allows this to occur along with searching, file look-up, and 24-bit integer expression evaluation.

Minimum Hardware: OS/8 Configuration, 8K
Other Programs Needed: OS/8
Source Language: PAL-8

DECUS NO. 8-609

OCOMP - Octal Compare and Dump

Dennis McGhie and Jim Crapuchettes, Frelan Associates, Menlo Park, California

An OS/8 utility program to compare or dump OS/8 files. Masking for compares and searching for dumps are included. The output file contains the contents in octal from the first input file, of all (dump) or part of the words (compare, search) from the file. This program is useful for comparing two versions of a ".SV" file.

Minimum Hardware: OS/8 Configuration (Source file is supplied on DECtape)
Other Programs Needed: OS/8
Source Language: PAL-8

DECUS NO. 8-610

INVENT-8

Charles Moeder, Digital Equipment Corporation, Maynard, Massachusetts

INVENT-8 is a series of subroutines for manipulating binary unformatted data running under the OS/8 Monitor (OS/8 FORTRAN II). It allows the user to open input and output files as well as read and write binary unformatted, fixed length records of up to 125 12-bit word per record.

Also included is a generalized sort generator for sorting these core image records.

Minimum Hardware: OS/8 Configuration, 8K, 64K Mass storage peripheral
Other Programs Needed: OS/8 FORTRAN
Source Language: SABR

DECUS NO. 8-611

SLED - Source and Listing Editor

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

Programs written in condensed format (with lines separated by semicolons and extended as required) do not give neat listings, suitable for publication, when passed through the standard MACRO or PAL III assemblers. SLED secures a neat listing from the raw listing tape produced from the assembler, with one blank line before each label, except labels used to define zero constants, and two blank lines before every break in program counter sequence. Along each line, non-significant spaces are eliminated to give a nicely justified format, and the obtrusive semicolons are removed. The number of lines to a page are controlled and new pages automatically started at suitable points in the listing. Pagination and titling are automatic. The program can be used to lay out source tapes in a similar manner.

Minimum Hardware:	PDP-8, TTY, HSR and/or HSP optional
Restrictions:	Program written for non-standard high speed paper tape reader - use standard DEC reader with caution. One delay needs adjustment for computer other than 8/S
Source Language:	MACRO

DECUS NO. 8-612

ELAN - Elementary Linguistic Analysis

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

ELAN is a simple program for educational demonstrations of the use of a computer in language studies. From an input of arbitrary length it counts the occurrence of every letter, punctuation mark, and other symbol in the sample, and also can be set to count the occurrences of up to 64 nominated words, or the beginnings or endings of words, each with a maximum length of 7 characters, and to present all these counts in a convenient format at the end of the sample, together with a word length analysis and a count of the number of paragraphs in the sample. Input can be by paper tape, using either a teletype of HSR, or directly from the keyboard.

Minimum Hardware:	PDP-8, TTY, HSR optional
Restrictions:	Developed for non-standard HSR; use DEC HSR with caution
Source Language:	MACRO

DECUS NO. 8-613

Interconversion Between A/D Floating Point and D/A Formats

Brian C. Hodgkin, Ph.D., Maine Medical Center, Portland, Maine

A collection of subroutines is provided which makes possible the conversion of data in one format to either of the other two formats. Complex calculations can be performed on A/D inputted information using floating point arithmetic, with results outputted in any of the three formats. Machine language and floating point programs can be intermingled by appropriate initialization and use of the subroutines.

Minimum Hardware:	PDP-8, A/D and/or D/A converter
Other Programs Needed:	23-bit Floating Point Package (DEC-08-NFPPA-A-PB)
Restrictions:	Can be used in single field as is; can be modified for multi-field operation. A/D and D/A formats must be the same as ADØ1A and AA50
Source Language:	PAL III

DECUS NO. 8-614

Clock Calibration

Masashi Kamii, The Central Institute for Experimental Animals, Nogawa, Kowasaki, Japan

Using CRT (RM503) and X'TAL-clock in an AX08 configuration this program allows visible calibration of the RC-clock.

Minimum Hardware:	LAB 8/I (PDP-8/I and AX08 without XR, XC, XM option)
Source Language:	PAL III

DECUS NO. 8-615

EAE Multiplication for 8K FORTRAN

Donald C. Parker, Clarkson College of Technology, Potsdam, New York

This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/I or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.RL. Core space, however, has been sacrificed for this additional speed.

Other Programs Needed:	8K FORTRAN
Source Language:	SABR

DECUS PROGRAM LIBRARY
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VOLUME I

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FOCAL8-192	Echo Change for FOCAL, 1969	D01, F02
FOCAL8-193	Anova, 2-way, Unsymmetrical	A01, G02
FOCAL8-194	Rectangular to Polar Coordination (German)	D01, G02
FOCAL8-195	All purpose Graphing Program	D01, G02
FOCAL8-196	Fisher's Exact Test	D01, G02
FOCAL8-197	Self-Teaching Program for FOCAL	D01, G02
FOCAL8-198	Michaelis-Menten Kinetics	D01, G02
FOCAL8-199	Stock Market Game	D01, G02
FOCAL8-200	SIMEQR - 20 Simultaneous Equations in 8K FOCAL	D01, G02
FOCAL8-201	FOCAL Patch for Function FP, Mod 4B	D01, F02, G02
FOCAL8-202	Code Generator	D01, G02
FOCAL8-203	Graph Sketching	D01, G02
FOCAL8-204	Acid-Base Equilibria	D01, G02
FOCAL8-205	Random Walk/Array	A01, G02, W00
FOCAL8-206	FOCAL Generates Binary Patches	D01, G02
FOCAL8-207	EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator	D01, G02
FOCAL8-208	A Normally Distriubted Random Number Generator in FOCAL	D01, G02
FOCAL8-209	GRFIT, A Simple Least Squares Routine	D01, G02
FOCAL8-210	CHAIN and FCOM	A01, B05, F02, G06
FOCAL8-211	WEST-KY Four-User FOCAL	A01, H12, W00
FOCAL8-212	Automated Terminal Usage Accounting for Four-User FOCAL	A01, H12, W00 (Same DECtape)
FOCAL8-213	FOCAL Random Number Generator	D01
FOCAL8-214	FDSK, An Overlay for FOCAL to Read Data - Or Program - Files from the PS/8 Systems Device	A01, F02, G06, W00
FOCAL8-215	FOCAL 1969 Octyl Loader	D01, G02
FOCAL8-216	FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL	A01, F02, G06, W00

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-217	Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions	D01, G02
FOCAL8-218	FOCAL Overlay CHAIN	D01, F02
FOCAL8-219	Keyboard Controlled High Speed Punch Routine for FOCAL 1969	D01, F02, G02
FOCAL8-220	Individual Tablet Assay	D01, G02
FOCAL8-221	LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation	D01, G02
FOCAL8-222	Center of Gravity Calculation	D01, F02
FOCAL8-223	FOCLX, 1972	A01, F02, W00
FOCAL8-224	SPASTIC - A System for Programming Angles, Scaler and Timer by Internal Counting	D01, F02, G06
FOCAL8-225	Loan Amortization Schedule	D01
FOCAL8-226	Frequency Transformation Program	D01, F02, G02
FOCAL8-227a	FOCL/F - An extended version of 8K FOCAL 69	A01, B13, F06, H12, J11
FOCAL8-228	Great Circle Distance Between 2 Points	D01, G02
FOCAL8-229	H-800 Wiring Diagrams	D01, G02
FOCAL8-230	CALCOMP Plotter FNEW PLOTX	D01
FOCAL8-231	Extended Precision Sine and Cosine for 4-word FOCAL	D01, F02, G02
FOCAL8-232	Roots by Inverse Interpolation	D01, G02
FOCAL8-233	A FOCAL-Correlation Program for the LAB-8 System 1. Auto-and Cross-Correlation Program 2. Auto-Correlation Program	D01, F02, G02
FOCAL8-234	Action Indicator Calculator	D01, G02
FOCAL8-235	MPS Radiation Pattern Program	D01, G02
FOCAL8-236	Polynomial Curve Fitting (Streamlined Programs)	D01, G02
FOCAL8-237	Bond Computations	D01, G02
FOCAL8-238	Millikan Oil Drop Experiment	D01, G02

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-239	DIV- Program for Division	D01, G02
FOCAL8-240	Science Fiction Quiz	D01, G02
FOCAL8-241	Satellite Orbital Parameters	D01, G02
FOCAL8-242	Solution of Linear Equation Systems with Symmetrically Matrix	D01, G02
FOCAL8-243	Analysis of Variance for One- Two - and Three-Treatment Designs for a PDP-8	D01, G06
FOCAL8-244	HANGMAN IV	D01, G02
FOCAL8-245	Executive and Utility Routines for FOCLX, 1972	D01, G02
FOCAL8-246	Undefeatable FOCAL TIC-TAC-TOE	D01, G02
FOCAL8-247	FNEWS Overlay to Use High Speed Punch with FOCAL Program	D01, F02, G02
FOCAL8-248	FOCTXT - Text Input-Output Patch to FOCAL-1969	D01, G02
FOCAL8-249a	Payroll Listings and Totals	D01, G02
FOCAL8-250	Six Curves - GMS037	D01, G02
FOCAL8-251	"WORD" - Character Generation Using FOCAL's FDIS Function	D01, G02
FOCAL8-252	12K Overlay for FOCAL	D01, F02, G02
FOCAL8-253	Solution to Any Equation Involving One Variable	D01, G02
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL, 1969	A01, F02, G02, W00
FOCAL8-255	Repeating Decimal	D01, G02
FOCAL8-256	OPTION $	D01, F02
FOCAL8-257	LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM	D01
FOCAL8-258	Hearing Loss Simulation	D01, G02
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69	D01, F02, G02
FOCAL8-260	Arithmetic and Geometric Progressions	D01, G02
FOCAL8-261	Chi Square Utility Package, CHISQR	D01, G02
FOCAL8-262	Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug	D01, G02
FOCAL8-263	ROOTS, A Polynomial Root Finder	D01, G02

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-264	MEMORY, A Children's Game	D01, G02
FOCAL8-265	LISTAL	D01, G02
FOCAL8-266a	STATPACK, An Interactive Statistical Package	A01, H12, W00
FOCAL8-267	BLACKJACK for FOCAL 1969	A01, G02, W00
FOCAL8-268	FX Function for Random Access Files	D01, G02
FOCAL8-269	4K FOCAL '69 Speed-Up Patches	D01, H12 *
FOCAL8-270	MONOPOLY	A01, G06, W00
FOCAL8-271	Modifications of FOCL/F for Data Acquisition and Control	A01, W00
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)	D01, G02
FOCAL8-273	The Phi Phenomenon	D01, G02
FOCAL8-274	FOCAL 5/69 Input Buffer Patch	D01, F02
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype	D01, G02
FOCAL8-276	The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data	D01, G02
FOCAL8-277	Newton Binomial	D01, G02
FOCAL8-278	A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$	D01, G02 (Specify 4K or 8K Tape)
FOCAL8-279	MUSECL MUS16	D01, G02
FOCAL8-280	Improved Multiply Loop for FOCAL	D01, F02, G02
FOCAL8-281	French Language FOCAL, 5/69	D01, F02, G02
FOCAL8-282	CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars	D01, G02
FOCAL8-283	Improved EAE Routine for FOCAL	D01, F02, G02
FOCAL8-284	8/E EAE Routine for FOCAL	D01, F02, G06
FOCAL8-285	Online Graph - With Self Determining Scale Factor	D01, G02
FOCAL8-286	Arithmetic Practice	D01, G02
FOCAL8-287	CC-FOCAL-Q	D01, F02
FOCAL8-288	FSPACE - Space Command for FOCAL '69	D01, F02, G02

* Same DECtape; includes 8-608 and 8-609

No.	TITLE	MEDIA/PRICE CODES
FOCAL8-289	TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible With the TTY Intercom Terminal to CDC6000 Computer Series	D01, F02, G02
FOCAL8-290	Kolmogorov-Smirnov Test for Normality	D01, G02
FOCAL8-291	DRANO	D01, F02
FOCAL8-292	CHCIG8	D01, F06, G06
FOCAL8-293	A Laboratory and Real Time Patch with FNEW FOCAL 5/69	D01, F02, G06
FOCAL8-294	Real Time FOCAL on the PDP-8 Computer	D01, F06
FOCAL8-295	ATTND - Monthly Attendance Reporting Module	D01, G02
FOCAL8-296	FOCALINUS - Molecular Geometry Calculator	A01, F02, G02, W00
FOCAL8-297	LUNGS - A System of Programs for the Calculation of Selected Cardiorespiratory Parameters	D01, F02, G06
FOCAL8-298	Critical Points of a P (x) of Degree N (Real Coefficients)	D01, G02
FOCAL8-299	FOPAY - Weekly Payroll Deductions and Computations	D01, G02

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-1	NC	$	$	$ NC	$	$	$	$	$	$	
FOCAL8-2	NC	1.		NA							
FOCAL8-3	NC			NC							
FOCAL8-4	NC			NC							
FOCAL8-5	NC		1.	NC							
FOCAL8-6	NC	1.		NA							
FOCAL8-7	NC	1.		NC							
FOCAL8-8	NC	1.	5.	NC							
FOCAL8-9	NC		5.	NC							
FOCAL8-10	NC			NC							
FOCAL8-11	NC	1.	5.	NC							
FOCAL8-12	NC			NC							
FOCAL8-13	NC			NC							
FOCAL8-14	NC			NC							
FOCAL8-15	NC			NC							
FOCAL8-16	NC	1.	5.	NC							
FOCAL8-17	NC			NA							
FOCAL8-18	NC			NC							
FOCAL8-19	NC		1.	NA							
FOCAL8-20	NC		1.	NC							
FOCAL8-21	NC			NC							
FOCAL8-22	NC			NC							
FOCAL8-23	NC			NC							
FOCAL8-24	NC			NC							
FOCAL8-25	NC			NC							
FOCAL8-26	NC		1.	NA							
FOCAL8-27	NC			NC							
FOCAL8-28	NC			NC							
FOCAL8-29	NC			NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-30	NC	$	$	$ NC	$	$	$	$	$	$	
FOCAL8-31	NC			NC							
FOCAL8-32	NC			NA							
FOCAL8-33	NC			NC							
FOCAL8-34	NC			NC							
FOCAL8-35	NC			NC							
FOCAL8-36	NC			NC							
FOCAL8-37	NC			NC							
FOCAL8-38	NC			NC							
FOCAL8-39	NC			NC							
FOCAL8-40	NC		3.	NA							
FOCAL8-41	NC		1.	NC							
FOCAL8-42	NC		1.	NC							
FOCAL8-43	NC			NC							
FOCAL8-44	NC			NC							
FOCAL8-45	NC			NC							
FOCAL8-46	NC			NC							
FOCAL8-47	NC			NC							
FOCAL8-48	NC		1.	NC							
FOCAL8-49	NC		1.	NC							
FOCAL8-50	NC		2.	NC							
FOCAL8-51	NC	1.		NA							
FOCAL8-52a	NC	1.	5.	5.	5.	17.	5.	15.			Bin or src files on DECtape or LINCtape
FOCAL8-53	NC			NA			5.	15.			On 1 LINCtape
FOCAL8-54	NC		1.	NA							
FOCAL8-55	NC		2.	NC							
FOCAL8-56	NC		1.	NC							
FOCAL8-57	NC	1.	5.	NC							
FOCAL8-58	NC			NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information at end of this section

November 1972

DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-116	NC	$ 1.	$	$ NC	$	$	$	$	$	$	
FOCAL8-117	NC		1.	NC							
FOCAL8-118	NC		3.	NC							
FOCAL8-119	NC		2.	NC							
FOCAL8-120	NC		1.	NC							
FOCAL8-121	NC		1.	NC							
FOCAL8-122	NC		1.	NC							
FOCAL8-123	NC	1.	5.	NC							
FOCAL8-124	NC		2.	NC							
FOCAL8-125a	NC		1.	NC							
FOCAL8-126	NC		1.	NC							
FOCAL8-127	NC		1.	NC							
FOCAL8-128	NC		1.	NC							
FOCAL8-129	NC		1.	NA							
FOCAL8-130	NC		1.	NC							
FOCAL8-131	NC		1.	NC							
FOCAL8-132	NC		5.	NC							
FOCAL8-134	NC		1.	NC							
FOCAL8-135	NC	1.		NC							
FOCAL8-136a	NC	1.		NA							
FOCAL8-137	NC		1.	NA							
FOCAL8-138	NC		1.	NC							
FOCAL8-139	NC	1.		NC							
FOCAL8-141	NC	1.	5.	NC							
FOCAL8-142	NC		1.	NC							
FOCAL8-143	NC		1.	NC							
FOCAL8-144	NC			NA	5.	17.					On 1 DECtape
FOCAL8-145	NC			5.	5.	17.					On 1 DECtape
FOCAL8-146	NC		1.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE BIN	PAPER TAPE ASCII	LISTING	DECTAPE U/S	DECTAPE D/S	LINCTAPE U/S	LINCTAPE D/S	MAGTAPE U/S	MAGTAPE D/S	OTHER INFORMATION
FOCAL8-147	NC	$	$ 1.	$ NA	$	$	$	$	$	$	
FOCAL8-148A	NC	1.		NA	5.	17.					4K] DECtape is
FOCAL8-148B	NC	1.		NA							8K] Source for both
FOCAL8-149	NC		1.	NA							
FOCAL8-150	NC	1.	1.	NC							
FOCAL8-151	NC		2.	NC							
FOCAL8-152	NC		1.	NC							
FOCAL8-153	NC	1.		NC							
FOCAL8-154	NC	1.	5.	5.							
FOCAL8-155	NC		1.	NA							
FOCAL8-156	NC		1.	NC							
FOCAL8-157	NC	1.		NC							
FOCAL8-158	NC		1.	NC							
FOCAL8-159A	NC			NC							
FOCAL8-159B	NC			NC							
FOCAL8-159C	NC			NC							
FOCAL8-160	NC		2.	NC							
FOCAL8-161	NC		1.	NC							
FOCAL8-162	NC	1.	5.	NC							
FOCAL8-163	NC		3.	NA							
FOCAL8-164	NC	1.		NC							
FOCAL8-165	NC		1.	NC							
FOCAL8-166A	NC		1.	NC							
FOCAL8-166B	NC		1.	NC							
FOCAL8-167	NC		5.	NC							
FOCAL8-168	NC		1.	NC							
FOCAL8-169	NC		1.	NC							
FOCAL8-170	NC		5.	NA	(COMPLETE SET) OR						
FOCAL8-170.1	NC		1.	NA							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-222	NC	$ 1.	$	$ NC	$	$	$	$	$	$	
FOCAL8-223	NC	1.		NA							
FOCAL8-224	NC	1.	5.	NC							
FOCAL8-225	NC			NC							
FOCAL8-226	NC	1.	5.	NC							
FOCAL8-227a	NC	1.		10.	5.	17					
FOCAL8-228	NC		1.	NC							
FOCAL8-229	NC		2.	NC							
FOCAL8-230	NC			NC							
FOCAL8-231	NC	1.	5.	NC							
FOCAL8-232	NC		1.	NC							
FOCAL8-233	NC	1.	5.	NC							
FOCAL8-234	NC		1.	NC							
FOCAL8-235	NC		1.	NC							
FOCAL8-236	NC		3.	NC							
FOCAL8-237	NC		1.	NC							
FOCAL8-238	NC		1.	NC							
FOCAL8-239	NC		1.	NC							
FOCAL8-240	NC		1.	NC							
FOCAL8-241	NC		1.	NC							
FOCAL8-242	NC		3.	NC							
FOCAL8-243	NC		5.	NC							
FOCAL8-244	NC		1.	NC							
FOCAL8-245	NC		1.	NC							
FOCAL8-246	NC		1.	NC							
FOCAL8-247	NC	1.	5.	NC							
FOCAL8-248	NC		5.	NC							
FOCAL8-249a	NC		1.	NC							
FOCAL8-250	NC		1.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-251	NC	$	$2.	$ NC	$	$	$	$	$	$	
FOCAL8-252	NC	1.	5.	NC							
FOCAL8-253	NC		1.	NC							
FOCAL8-254	NC	1.	5.	NA							
FOCAL8-255	NC		1.	NC							
FOCAL8-256	NC	1.		NC							
FOCAL8-257	NC			NC							
FOCAL8-258	NC		2.	NC							
FOCAL8-259	NC	1.	5.	NA							
FOCAL8-260	NC		1.	NC							
FOCAL8-261	NC		1.	NC							
FOCAL8-262	NC		2.	NC							
FOCAL8-263	NC		1.	NC							
FOCAL8-264	NC		5.	NC							
FOCAL8-265	NC		1.	NC							
FOCAL8-266	NC			NA	5.	17.					
FOCAL8-267	NC		1.	NA							
FOCAL8-268	NC		5.	NC							
FOCAL8-269	NC			NA	5.	17.					Tape with 8-608 & 609
FOCAL8-270	NC		5.	NA							
FOCAL8-271	NC			NA							
FOCAL8-272	NC		1.	NC							
FOCAL8-273	NC		1.	NC							
FOCAL8-274	NC	1.		NC							
FOCAL8-275	NC		1.	NC							
FOCAL8-276	NC		1.	NC							
FOCAL8-277	NC		1.	NC							
FOCAL8-278	NC		2.	NC							4K Paper tape - $1.00 8K Paper tape - $1.00
FOCAL8-279	NC		1.	NC							

N/C - No Charge
N/A - Not Available

U/S - User Supplied Tape (Certified)
D/S - DECUS Supplied Tape

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DEC 7-(369)1112A-R1172

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-280	NC	$1.	$1.	$ NC	$	$	$	$	$	$	
FOCAL8-281	NC	1.	1.	NC							
FOCAL8-282	NC		1.	NC							
FOCAL8-283	NC	1.	5.	NC							
FOCAL8-284	NC	1.	5.	NC							
FOCAL8-285	NC		1.	NC							
FOCAL8-286	NC		1.	NC							
FOCAL8-287	NC	1.		NC							
FOCAL8-288	NC	1.	5.	NC							
FOCAL8-289	NC	1.	1.	NC							
FOCAL8-290	NC		1.	NC							
FOCAL8-291	NC	1.		NC							
FOCAL8-292	NC	1.	5.	NC							
FOCAL8-293	NC	1.	5.	NC							
FOCAL8-294	NC	2.		NC							
FOCAL8-295	NC		1.	NC							
FOCAL8-296	NC	1.	5.	NA							
FOCAL8-297	NC	1.	5.	NC							
FOCAL8-298	NC		1.	NC							
FOCAL8-299	NC		1.	NC							

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N/A - Not Available

U/S - User Supplied Tape (Certified)
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GENERAL INFORMATION

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Payment for DECUS Coupons must be made in advance. Purchase Orders for coupons must be paid before coupons can be issued.

All charges are in U. S. dollars, and are subject to change without notice.

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Non-attendees - $5.00 per copy

Charges for DECUS three-ring binders are:

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Two inch (2") Blue general DECUS binder - $3.50

When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

A complete set of all current FOCAL8 write-ups is available for a service charge of $35.00.

July 1974

FOCAL8 PROGRAM ABSTRACTS

DECUS NO. FOCAL8-1

A Pseudo Random Number Generator for the PDP-8 for use with FOCAL

Gary A. Griffith, Georgia Institute of Technology, Atlanta, Georgia

A pseudo random number generator adapted to the PDP-8 computer has been tested for randomness and uniformity. The test for randomness shows a definite bias. However, this generation algorithm compares favorably with others presently being used. It was written to replace the random number generator of the 4K FOCAL language.

Minimum Hardware: 4K PDP-8
Source Language: 4K FOCAL

DECUS NO. FOCAL8-2

XOD Modification for use with FOCAL

Georgia Institute of Technology
Submitted by: John Alderman, Applied Data Research, Atlanta, Georgia

This program contains modifications to XOD (DECUS NO. 8-89) which allow it to be used to debug FOCAL. It also contains certain changes for the command character set which make them more like ODT-2, which is desirable for installations with many inexperienced users.

DECUS NO. FOCAL8-3

DISK FOCAL

D. E. Wrege and J. C. Alderman, Georgia Institute of Technology, Atlanta, Georgia

A dialect has been developed utilizing the disk (DF32 or RF08) for both text and variable storage in a 4K PDP-8. Variable storage is via the arrayed function FNEW, while text is stored via the LIBRARY command which has been pre-empted for the purpose. Limitations of programming complexity in the current version limit the user to about 6 complete FOCAL program images and 1320 DISK FNEW variables (8K of the disk). A trivial modification to the coding will allow the user to expand the disk area. The package was written for the DF32, but changes required for the RF08 are easily made by a user of such. The Disk/DECtape Monitor does not protect the user's files generated by the use of the package, but a program to implement the protection is under development.

DECUS NO. FOCAL8-4

PRIME PLOTS

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program plots successive primes while cycling over a specified prime interval. The interpretation of the results are left to the user.

DECUS NO. FOCAL8-5

The Sumer Game

Doug Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Canada

This is a simulation program/game which will run on a minimal PDP-8 system. The economy of a Sumerian city in the year 3000 B. C. is simulated in the fashion of a modern-day "business game."

DECUS NO. FOCAL8-6

FOCAL-8 Patch for LINC-8 Display

Peter Goldstern, Digital Equipment Corporation

This patch causes FDXS and FDYS commands in FOCAL to be displayed on the LINC-8 Display. This patch applies only to DEC-08-AJAD-PB, FOCAL.

Minimum Hardware: LINC-8
Other Programs Needed: FOCAL DEC-08-AJAD-PB

DECUS NO. FOCAL8-7

STRIP FOCAL: Storage of Data Arrays in FOCAL

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

This program, written for FOCAL W on an 8K machine, accepts data from paper tape on the high speed reader, and displays it on the Type 34 display unit. The data is stored in upper core, or on the disk, using the FNEW array. An ERASE or ERASE ALL command will not wipe out the stored data. Several sets of data may be stored in different sections of the array with the user keeping track of the indices.

Other Programs Needed: FOCAL W

DECUS NO. FOCAL8-8

Magtape FOCAL

J. C. Alderman, Applied Data Research, Atlanta, Georgia

A sophisticated handler package for the TC58 IBM compatible magtape controller in the FOCAL language. Data is transmitted to/from the FNEW arrayed storage in FIELD 1. The features of I/O overlap with program execution, defeatable error diagnostics, and programmable tape density and unit selection have been incorporated into the coding. Syntax is via the LIBRARY command, and there is extensive error checking of user calls.

The FIELD 1 resident portion of the magtape handler is removable by other users, and the result is a general purpose LIBRARY command handler package, capable of being linked to any device using the interrupt. A functional argument is transmitted to the FIELD 1 coding, and any number of numerical arguments may be evaluated.

DECUS NO. FOCAL8-9

Hexapawn

Ralph Mayer
Submitted by: Walter Koetke, Lexington High School, Lexington, Massachusetts

The object of this program is to have the computer "learn" to play a game, called Hexapawn.

Hexapawn is played on a square board and each player has three pawns. A pawn can move forward to an empty space or diagonally forward to capture an opponent's pawn. One wins by having any one of his pawns reach the opponent's side of the board, by making it impossible for the opponent's pawn to move, or by capturing all of the opponent's pawns.

The computer "learns" to play this game by remembering each of the possible board configurations when it is encountered during a game, and then determining and remembering all of the possible moves applicable to each board configuration.

Storage Requirement: 8K

DECUS NO. FOCAL8-10

Patch to FOCAL W for LINC-8 A-D Converter

Dr. T. Nichols, Department of the Army, U. S. Army Natick Laboratory, Natick, Massachusetts

This patch allows FOCAL W programs to use the LINC-8 analog to digital converter.

Execution of each function call requires approximately 10 milliseconds, limiting the maximum sampling rate to 100 SPS.

Minor changes to the patch will allow the execution of any single LINC instruction (stored at LINSTR) by FOCAL programs.

DECUS NO. FOCAL8-11

EAE Routines for FOCAL

J. Dwight Aplevich, University of Chicago, Committee on Mathematical Biology, Chicago, Illinois

This patch replaces the floating point system in FOCAL with one nearly identical to the standard EAE Floating Point package. A new floating integer subroutine is included, as well as a multiplicative-congruential pseudo random number generator. New FITR and FRAN routines are included.

Minimum Hardware:	PDP-8 with type 182 EAE
Other Programs Needed:	FOCAL DEC-08-AJAB (4/29/68)
Storage Requirement:	6400-7577; 5753-5777
Restrictions:	Will NOT fit other versions of FOCAL
Source Language:	PAL

DECUS NO. FOCAL8-12

QUIP1 - Quick Plot in Quadrant 1

D. A. Dalby, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

The implementation of an additional extended function named "FLOT" in FOCAL to generate a straight line plot on a CalComp 563 incremental plotter considerably increases the usefulness of FOCAL for simple plotting applications. QUIP is a program in FOCAL language which demonstrates one use of the FLOT function: to generate a general XY plot in the first quadrant. The user simply types the control parameters and (x,y) values on the keyboard. An infinite set of plotting symbols of continuously variable size, width-to-height ratio, symbol order (number of strokes), and positive (counter-clockwise) or negative (clockwise) rotation is available by simply typing the appropriate parameters on the keyboard.

Minimum Hardware:	PDP-8, ASR33, CalComp 563 Incremental Plotter

DECUS NO. FOCAL8-13

3D PLOTTER

John M. Jamieson, Georgia Institute of Technology, Atlanta, Georgia

This program, written in FOCAL, plots a function, Z, of two other variables, X and Y, on the memoscope or X-Y plotter. The function must be written in Cartesian space.

Minimum Hardware:	8K PDP-8, storage scope and/or X-Y plotter, ASR33, HSR
Other Programs Needed:	FNEW array, Extended FOCAL for some functions
Storage Requirement:	8000 words

DECUS NO. FOCAL8-14

Least Squares Fit to a Straight Line

Edward T. Chow, Georgia Institute of Technology, Atlanta, Georgia

This is a program using the principle of least squares to fit a straight line to a set of up to 35 experimental data points.

The program requires one pass of the data. At the end of the pass the output gives the values of the slope and the intercept of the straight line equation. In addition, the calculated values of the experimental data based on the straight line equation are pointed out. Finally, the program gives the value of R which is a criterion of fitness of equation to the input data.

Other Programs Needed: FOCAL DEC-08-AJAB

DECUS NO. FOCAL8-15

Least Squares Fit to a Cubic Polynomial

Edward T. Chow, Georgia Institute of Technology, Atlanta, Georgia

This is a program using the method of least squares to fit a cubic polynomial to a set of experimental data. The program demands two passes of the data for its completion; however, the coefficients of the polynomial are outputted after the first pass, and at the end of the second pass the output gives the value of R which is a criterion of fitness and gives the calculated values of the experimental data based on the cubic polynomial.

In addition, a section of the program can be used as a self-contained program for solution of a set of N by N linear equations.

Other Programs Needed: FOCAL DEC-08-AJAB

DECUS NO. FOCAL8-16

One-Sample Statistics: Two-Sample Statistics: Welch Procedure; One-Way Analysis of Variance; Sheffe's Contrast Between Means

M. J. McKeown, University of Chicago, Department of Obstetrics and Gynecology, Chicago, Illinois

A three part program used to perform one-sample and two-sample statistics, Welch Procedure; One-Way Analysis of Variance; and Sheffe's Contrast between Means, which allows one to investigate more thoroughly the source of the difference between group means.

DECUS NO. FOCAL8-17

FOCAL: How to Write New Subroutines and Use Internal Routines

Doug Wrege, Engineering Experiment Station, Georgia Institute of Technology, Atlanta, Georgia

This document is an attempt to explain how user-developed software can be interfaced to the basic FOCAL package, without requiring the user to spend valuable time trying to understand all of its detailed workings. Section II deals with a general discussion of how FOCAL works, in a descriptive fashion. Section III is concerned with the philosophy of the language, and the last few sections are technically oriented toward helping the user actually code his additions. Several examples and ready-coded routines, which may be used to simplify the user's problems are included.

An extension of this document, which includes most of the discussions contained in this volume, is offered as DECUS NO. FOCAL8-271. (See abstract)

DECUS NO. FOCAL8-18

T-ASK

J. Alderman, Applied Data Research, Atlanta, Georgia

This subroutine, available in two versions, Standard FOCAL Version and FNEW Array FOCAL Version, allows the user to enter an input unit, as well as a number, and converts the number to a common unit before returning to the calling program. It is particularly useful for programs utilizing TIME as an input parameter, since the program will convert the following units to seconds: YEARS, DAYS, HOURS, MINUTES, SECONDS, AND FORTNIGHT.

DECUS NO. FOCAL8-19

Least Squares Fit to an Exponential

Submitted by: J. W. Lynn, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

This program is used in conjunction with "FOCAL" to make the best two parameter least squares fit of

$$Y = A * EXP (ALPHA * X)$$

to the user's data.

DECUS NO. FOCAL8-20

MULTIPULSE

Chris Hamilton, Georgia Institute of Technology, Atlanta, Georgia

A FOCAL program for use on PDP-8 to check the differential linearity of a multichannel pulse height analyzer.

DECUS NO. FOCAL8-21

MULTIPULSE-2

Chris Hamilton, Georgia Institute of Technology, Atlanta, Georgia

MULTIPULSE-2 (M-2) will calculate the differential non-linearity of a multichannel pulse height analyzer using as data a Compton spectrum on paper tape which has been expanded through all channels whose channel width deviation is under study.

DECUS NO. FOCAL8-22

Monte Carlo Solution to Neutron Penetration Problem

Bryan W. McGhee, Georgia Institute of Technology, Atlanta, Georgia

This display is a one axis display (Z coordinate only) of each scattering event - though scattering is calculated in 3-dimensions. The axis shifts upward for each new neutron to facilitate ease of following collisions.

DECUS NO. FOCAL8-23

Seismic Refraction Sloping Layer Program

David D. Prentiss, Atlantic Oceanographic Laboratory, Bedford Institute, Dartmouth, Nova Scotia, Canada

This program, developed for a PDP-8 4K machine, requires the full library of functions. It calculates a seismic refraction model using the slope-intercept method of M. Ewing, G. P. Woollard and A. C. Vine proposed in 1939 and the notation of J. I. Ewing's article on marine seismic refraction and reflective methods appearing in Volume III of "The Sea."

Source Language: FOCAL, 8/68

DECUS NO. FOCAL8-24

GRADE: A Grade Averaging and Display Program

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

This program will average grades from a number of quizzes, taking into account weighting factors of relative importance between quizzes, and plot a histogram of the number of grades in a given percentile.

Minimum Hardware: PDP-8 with extended memory (4K if no display required), Type 34 Display

Source Language: FOCAL W

DECUS NO. FOCAL8-25

Payroll Calculations (California, 1968)

G. L. Helgeson, Helgeson Nuclear Services, Inc., Pleasanton, California

This routine is used to calculate payrolls. It is based on the California State Unemployment Insurance rate, FICA rate and withholding tax.

This program could be modified easily to fit the rules of any particular state. If some of the pay ranges would not be used, they could be omitted from the two tables, making more room for other routines, such as providing running totals on gross pay, deductions, and net pay.

Source Language: FOCAL, 1968

DECUS NO. FOCAL8-26

Curve Fitting

Richard Rothman, Groton School, Groton, Connecticut

This program finds the best curve of a set of points. There are three types of curves involved: 1) Exponential Curve, $Y = Ae^{BX}$; 2) Power Curve $Y = AX^{N}$; 3) Linear Line $Y = MX + B$.

DECUS NO. FOCAL8-27

Δ - Y Complex; Y - Δ Complex; Series Resonant Circuit Analysis

David H. Tyrrell, Middlesex County College, Edison, New Jersey

Δ - Y Complex - This program does a DELTA-WYE transformation for A-C circuits.

Y - Δ Complex - This program does a WYE-DELTA transformation for A-C circuits

Series Resonant Circuit Analysis - This program computes resonant frequency, bandwidth, Q, and values of inductive and capacitive reactance of resonance for a given R-L-C series circuits. It also produces, upon request, a table of impedance and phase angle for 10 points each side of the resonant frequency. Distance between points is determined by a user inputted DELTA-F.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-28

Column Width; Traverse; Least Square "Linear Fit;" Nozzle Weight Flow; Filter Design; Ohm's Law

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Column Width - Used for typesetting calculations

DECUS NO. FOCAL8-28 (Continued)

Traverse - A civil engineering and surveying application to compute a closed traverse given bearings and distances.

Least Square "Linear Fit" - Finds slope and Y-intercepts for the equation Y=MX+B given a set of data observations.

Nozzle Weight Flow - Checks inlet pressure ratio and calculates the weight flow through the nozzle (from Hamilton Standard).

Filter Design - Plots filter output as well as numerical answers to a digital filter design problem.

Ohm's Law - Computes Ohm's Law.

DECUS NO. FOCAL8-29

Second Order Differential Equation

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

This is a routine to solve $\frac{D^2X}{DT^2} - K1 \cdot \frac{DX}{DT} + K2 \cdot X = \emptyset$ given K1, K2, and initial values for X, $\frac{DX}{DT}$, and $\frac{D^2X}{DT^2}$. The user also selects the time interval DT. The result is plotted on the TTY from time zero until interrupted.

A check is made for off-scale values.

DECUS NO. FOCAL8-30

One Line Routines; X^3 and Circle; Superposition; Circle

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

One Line Routines - Demonstrates ability to create a one line program loop to plot using library functions of the FOCAL language.

X^3 and Circle - Use of subroutines if function plotting.

Superposition - The ability to superimpose multiple functions with different print characters in one output plot.

Circle - A circle of radius 10 plotted by residuals.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-31

Sines; Factors; Figure Eight; Right Triangle Solutions

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Sines - Plotting several variables using sine functions.

Factors - Determines whether a number is prime or gives its factors.

Figure Eight - Will plot various sizes of figure eights by means or residuals. This is represented by a simple fourth order equation.

Right Triangle Solutions - Applies trigonometry relations and the Pythagorean theorem for a right triangle.

DECUS NO. FOCAL8-32

Translation Table - French

Submitted by: Iroquois Falls and Calvert District High School, Iroquois Falls, Ontario, Canada

FOCAL commands translated into French.

DECUS NO. FOCAL8-33

Square Matrix Multiply; Prime Number Generator; Least Common Multiple; Base to Base Integer Conversion; Repeating Decimal

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Square Matrix Multiply - The arduous task of multiplying two square matrices is quickly done by this FOCAL Matrix Multiplication routine.

Prime Number Generator - The Prime Number Generator is a program which will accept a number, N, and type out all primes less than that value. As soon as the program is finished it loops back and starts over again by asking for N.

Lease Common Multiple (LCM) - The LCM routine is a neat, short program which will compute the LCM of any number of positive integers.

Base to Base Integer Conversion - The FOCAL Base to Base Conversion routine will convert any positive integer less than 2048 from one base system to another.

Repeating Decimal Program - This routine computes the decimal equivalent to any rational number whose absolute value is less than 1.

DECUS NO. FOCAL8-34

Simultaneous Equations; Abbreviated Simultaneous Equations; Curve Fittings

Submitted by: Digital Equipment Corporation, Maynard, Massachusetts

Simultaneous Equations - A familiar multi-variable problem is solved for 1st - 6th order equation sets (9th order if extended functions are gone).

Abbreviated Simultaneous Equations

Curve Fittings - Plot of exponential equation.

DECUS NO. FOCAL8-35

Rootfinder Program

Ron Dorman, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

The Rootfinder program is a simple procedure, for use in determining the real roots of any suitable function. The program uses a conventional search to find root-containing intervals followed by a binary search (successive approximation method) to converge on the root value.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-36

Determinot Program

Ron Dorman, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

The Determinot program is a simple program which may be used to find the determinant of a square matrix of dimension 2 x 2 to 6 x 6. The method used in finding the determinant is based on the definition of the determinant and involves an N summation of products of N matrix terms with the proper inversion sign.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL 1968

DECUS NO. FOCAL8-37

N-th Degree Polynomial Data Point Fitting Routine; N-th Degree Polynomial Data Point Fitting Routine with RMS Error

R. E. McCullough, University of Colorado, Denver, Colorado

N-th Degree Polynomial Data Point Fitting Routine - This program accepts the x- and y- coordinates for an unlimited number of data points and calculates for the equation

$$Y = A_0 + A_1X + A_2X^2 + \ldots + A_NX^N ,$$

the coefficients A_N which best fit the equation to the data points. The fitting criterion is "least squares." The program allows the user to select the degree, N, of the fitting equation. N may be as large as 7.

N-th Degree Polynomial Data Point Fitting Routine with RMS Error - This program is the same as N-th Degree Polynomial Fitting Routine except that it calculates the RMS error between the y-coordinates of the data points and the evaluated fitting equation. It will accept only a limited number of data points and the maximum equation degree allowed is inversely related to this number.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-38

Magic Square Generator

Doug Dyment, Digital Equipment of Canada, Ltd., Carleton Place, Canada

The magic square generator will generate an odd order magic square of the indicated size (11 x 11 is the largest that will fit unless the format specification in line 2.8 is altered), using a set of sequential integers, beginning with the number specified.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-39

Rectangular to Polar Conversion; Polar to Rectangular Conversion

David H. Tyrrell, Middlesex County College, Edison, New Jersey

Rectangular to Polar Conversion - Converts complex numbers in rectangular form to polar form.

Polar to Rectangular Conversion - Converts complex numbers in polar form to rectangular form.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-40

Simple Chi-Square Test

Michael J. McKeown, University of Chicago, Chicago, Illinois

The program will type out the data matrix and cell contents. Each cell will contain two values; O = xxx.xxx and E = xxx.xxx. The "O=" number is the "OBSERVED" value which was typed in by the user. The "E=" value is the expected value calculated by the program. The program will also type out row sums (RS=) and column sums (CS=), and the grand total (T=). The last line of output will be "X2=" and "DR=". These are the CHI-SQUARE and degrees of freedom.

Restrictions: Number of columns in matrix is limited to size of teletype paper
Source Language: FOCAL 1968

DECUS NO. FOCAL8-41

FRAN THE BARMAID

Dr. Murray Vernon King, Massachusetts General Hospital, Boston, Massachusetts

A demonstration program which uses the random number generator to choose cocktail ingredients and their quantities.

Source Language: FOCAL 1968

DECUS NO. FOCAL8-42

The Hangman Game

Dan Miller, Glastonbury, Connecticut

The program allows the user to play the game of Hangman with the computer, that is, a word guessing game using a limited number of trials at the letters in the word. Will run in 4K if extended functions are removed.

Source Language: FOCAL8/68

DECUS NO. FOCAL8-43

A Collection of FOCAL Patches

Edward A. Taft, III, St. Mark's School, Southborough, Massachusetts

A collection of assembly-language patches designed to correct some errors and deficiencies in the FOCAL interpreter and to add some welcome FORTRAN-like versatility to the input and output.

These patches will operate properly with FOCAL, 8/68 (DEC-08-AJAC-PB) and with its 8K extension. It will also work in Field Ø of 2-user FOCAL, though not Field 1.

DECUS NO. FOCAL8-44

Magtape Analyser Using Universal I/O FOCAL

John C. Alderman, Jr., Applied Data Research, Atlanta, Georgia

This program sets up the tape unit to read one record 1000 decimal words (2000 characters) long into Field 1. After the record is read, the status register contents are printed in octal, and the number of characters computed from the remainder in the word-count address location. The number of characters is then printed in decimal. A routine is also available to print the contents of the record, two-characters-per-word in octal.

Minimum Hardware: 8K PDP-8 with TC-58/TU-2Ø (or TU-2ØA)
Other Programs Needed: Universal I/O Handler for FOCAL (DECUS NO. FOCAL8-45)
Source Language: FOCAL W

DECUS NO. FOCAL8-45

Universal I/O Handler for FOCAL

John C. Alderman, Jr., Applied Data Research, Atlanta, Georgia

The Universal I/O Handler for FOCAL makes it possible to write the hardware MAINDEC in a high-level language, and with the possibility that maintenance people can change, or write specific test routines in FOCAL as required.

Source Language: FOCAL W

DECUS NO. FOCAL8-46

4-Digit, 12-Bit Word Practice

Thomas Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will drill the student in interpreting lamp patterns on console of PDP-8 computer. Lamp patterns are presented, and then the user types in the correct octal notation. A tally is kept of the users' responses.

Minimum Hardware: 8K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-47

Fourier Synthesis of a Square Wave

Thomas Ford, White Mountains Regional High School, Whitefield, New Hampshire

Fourier Synthesis of a Square Wave will give the plot of a wave form for a variable number of terms.

Source Language: FOCAL-69

DECUS NO. FOCAL8-48

A FOCAL Program to Determine Low-Frequency Loudspeaker Parameters Experimentally

Richard Merrill and Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This program is a FOCAL translation of a program devised by J. P. Ashley and M. D. Swan used in determining the low-frequency characteristics of loudspeakers for use in speaker system and enclosure design. The method allows determination of speaker parameters using a minimum of testing equipment.

Minimum Hardware: 4K PDP-8, LINC-8 or PDP-12
Source Language: FOCAL-69

DECUS NO. FOCAL8-49

Constantine's Function

Richard May, Digital Equipment Corporation, Maynard, Massachusetts

This routine is the solution and graphical output of the function:

$$M(\sigma,\gamma) = \frac{4}{\pi} * \sum_{n=0}^{\infty\,(N=6)} (-1)^N * e^{\frac{-(N^2+1)}{2}} * \left(\frac{2\sigma}{\gamma}\right)^2 \times \pi^2$$

as $\frac{2\sigma}{\gamma}$ varies from 0 to 1.

Source Language: FOCAL-69

DECUS NO. FOCAL8-50

FOCAL Version of RC Active Filter

Bean and Roman, University of Texas, Southwestern Medical School, Dallas, Texas

This program is a FOCAL version of a program by Kincaid and Shirley as published in Electronic Design Volume 13. Derived from two fundamental equations, it can be used to design Butterworth or Chebyshev filters in either low-pass or high-pass versions of each. (See also FOCAL8-175)

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-51

FOCAL "WRITE" Patch

John Larkin, Technical Associates, Inc., Metairie, Louisianna

This patch changes the FOCAL "WRITE" routine to add blanks to paper tape generated by "WRITE," which corrects the "INPUT BUFFER OVERFLOW" error generated by loading long paper tapes into FOCAL-69.

Other Programs Needed: FOCAL-69
Restrictions: Will not run with 8K FOCAL

DECUS NO. FOCAL8-52a

FOCAL, 5/69
Edward A. Taft, III, Manchester, Massachusetts

This is a new version of FOCAL, based on FOCAL W, 8/69, which has been expanded and rewritten to remove numerous bugs and restrictions and to provide a large number of new commands and extended capabilities. Some of the new features are:

1) Better control over I/O devices, including high speed punch; 2) New I/O formats, including buffered input that accepts expressions as well as numbers, input and output of single ASCII characters, and a tabulation controller; 3) A group of "OPTION" commands that perform minor functions such as suppressing or restoring keyboard echo and changing I/O modes; 4) A more compact extended function package, resulting in an enlarged user area; also a command for deleting the extended functions; 5) Extended command formats, also a provision for using calculated line numbers.

A DECtape or LINCtape for this program and its 8K overlay (DECUS NO. FOCAL8-189) has been submitted by James Van Zee, University of Washington, for the convenience of PS/8-OS/8 programmers.

DECUS NO. FOCAL8-53

JMPFOCAL: FOCAL as a LINC-8 Subroutine

James E. Randall, Indiana University, Bloomington, Indiana

This system uses FOCAL W programs as LINC-mode subroutines on an 8K LINC-8. It allows FOCAL W to be used to process data stored on LINCtape.

The FOCAL programs are limited to 585 core locations and are slower than LINC floating point routines, but they are easy to write and to format.

Minimum Hardware: LINC-8 with 8K of memory
Other Programs Needed: User written LINC and FOCAL programs
Source Language: LAP6

DECUS NO. FOCAL8-54

Channel Information and Inverted Histogram Plot

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will accept up to 36 channels of information stored as A (I) during 'T' passes. It will then plot an inverted histogram using the symbol ' [ ],' spacing through vacant channels, and subtracting one count till all channels are vacant.

Source Language: FOCAL-69

DECUS NO. FOCAL8-55

Multichannel Analyzer

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This general program, Multichannel Analyzer, also includes a specialized version for the reduction of raw grades from the teacher's rank book to the letter grades specified for report cards. The method of visualizing scores is entirely the work of Kenneth L. Russell of Sam Houston State Teachers College, and quite adequately described in his publication 'Visual Grading' available from Educational Filmstrips, also of Huntsville, Texas.

The program will operate in 4K with the extended functions retained (they are not used) for at least 32 sets of data.

Source Language: FOCAL-69

DECUS NO. FOCAL8-56

Merchandise Price Tags

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program represents a preliminary effort to use the FOCAL language for the solution of a business oriented problem. With minimum input, the program will generate merchandise price tags, including the merchant's per-package-cost in a convenient code.

Source Language: FOCAL -69

DECUS NO. FOCAL8-57

FOCAL Display on a 338

David Whitely, International Computers Limited, Kidsgrove, Stoke-on-Trent, England

This program enables a vector display to be generated on a 338 using the instructions already available in FOCAL. It is also possible to draw blank vectors and to erase the display file under program control.

Minimum Hardware: 8K PDP-8, 338 Display
Source Language: FOCAL

DECUS NO. FOCAL8-58

A Patch to FOCAL W to use the LINC-8 Display

Peter Lemkin, NINDS PRB, National Institute of Health, Bethesda, Maryland

This program is a patch for FOCAL W (8/68) which lets users with LINC-8's use the LINC point display in FOCAL programs. The user sets up and intensifies the X and Y coordinates the same way as for the PDP-8 display except for the following differences:

A. X and Y coordinates are reversed so that for example:

SET H = FDXS(X)+FDIS(Y)
should be rewritten as
SET H = FDXS(Y)+FDIS(X)

B. The range of X is from 0 to 512_{10}
and the range of Y is from -256_{10} to $+256_{10}$

The patch clobbers the ARCTAN FOCAL function. If the ARCTAN function is needed, it can be computed from the FEXP function.

Source Language: FOCAL W

DECUS NO. FOCAL8-59

FOCAL Overlay Common Area for 4K Core Memory

Herbert Zimmermann, Digital Equipment GmbH, Koln, Germany

This program is an overlay which implements the common area with the function FNEW. Two versions of the overlay tape are available, one for FOCAL without extended functions, and one for FOCAL with extended functions. The overlay "common area" is read in in a normal way.

Minimum Hardware: 4K PDP-8
Other Programs Needed: Binary loader; FOCAL (DEC-08-AJAE-PB)
Source Language: FOCAL

DECUS NO. FOCAL8-60 (See DECUS NO. 8-251)

A System for Production of Problem Sets with Individualized Data

H. Bradford Thompson, Department of Chemistry, University of Toledo, Toledo, Ohio

This system produces problem sets for use in science and mathematics instruction, in which input data are changed for each student. Two programs are involved, (1) a FOCAL program into which the instructor inserts the algebra required to perform the calculations, and (2) a program which accepts a text with data positions marked, and then inserts individualized data from the FOCAL program (without the answers) and prints the copies.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL (Any version)
Source Language: FOCAL, PAL III

DECUS NO. FOCAL8-61

Least Square Fit to a Polynomial

Adrian Demayo, Department of Energy, Mines and Resources, Inland Water Branch, Water Quality Division, Ontario, Canada

Given L1 pairs of points $X_i(obs)$, $Y_i(obs)$ (i=1...L1) this program finds the coefficients B_i expression:

$$Y_i(calc) = \sum_{j-1}^{L} B_{j-1} X_i^{j-1} \quad (obs) \qquad L = NA...NB$$

$$i = 1...L1$$

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-62

The FOCAL TGH Clinical Package

H. Dominic Covvey, Toronto General Hospital, Toronto, Canada

This is a package of biomedical programs used for a variety of purposes, such as: calculation of gas concentration in the blood; volume measurements of the left ventricle; intake analog data; statistical analysis on pairs of data; washout studies; respiratory physiology; and a demonstration program which gives the first four or so components of the fourier series for a square wave.

Source Language: FOCAL

DECUS NO. FOCAL8-63

CURFIT

Donald L. Shirer, Valparaiso University, Valparaiso, Indiana

CURFIT is a program written in the FOCAL language which fits weighted or unweighted data to a straight line on a Cartesian, log-log or semilog graph. It calculates the slope

DECUS NO. FOCAL8-63 (Continued)

and intercept of the line, the standard error in these values, plus other measures of the "goodness" of fit. Values may be added or deleted from the data list easily, and there is no limit to the number of sample data pairs.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-64

Newton-Raphson Method for Determination of Polynomial Roots

Dan C. Stanzione, Electrical Engineering, Clemson University, Clemson, South Carolina

This program is used to determine the 'n' zeroes of a polynomail, f(x), where

$$f(x) = a_0 + a_1x + \ldots + a_nx^n$$

where a_0 and a_n are not equal to zero and a_0, $a_1 \ldots$, a_n are in general complex.

Minimum Hardware: Basic PDP-8 configuration
Restrictions: Delete extended functions when running on 4K machine
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-65

Kruskal-Wallis One Way Analysis of Variance by Ranks

Gene Sylwesiuk and Elliot N. Gale, SUNYAB, Department of Behavioral Science, Buffalo, New York

This is a statistical program which allows the user to test the difference between the means of k groups when the data are not parametric and are independent.

Minimum Hardware: PDP-8/S, ASR33
Restrictions: Delete extended functions
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-66

"QUICK SCAN" Using Scheffe's Calculation

W. P. Ronald, Canada Department of Agriculture, Research Station, Vancouver, British Columbia, Canada

This program is a modification of "Sheffe's Contrast Between Means" (FOCAL8-16), and is designed to be used in conjunction with FOCAL8-16, or with DECUS 5/8-9. Using the output from an analysis of variance calculation, it quickly supplies the user with a general picture of the significance of group mean differences, at any selected F level.

Storage Requirement: 41Ø locations
Restrictions: A large number of samples requires deletion of extended symbols
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-67

T-Test

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

This program is designed to calculate students' T- ratio for independent samples. The output format gives sample means and variances, standard error of the mean difference, the value of t, and the number of degrees of freedom upon which t is distributed.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-68

Determination of Roots of a Polynomial

A. E. Sapega, Trinity College, Hartford, Connecticut

This program will find all roots, real and complex, of a polynomial. The 4K version consists of four programs. Program I finds a real root. Program II divides the polynomial by the real root, so reducing the order of the polynomial by one. Program III finds complex roots after all real roots have been extracted. Program IV divides the polynomial by a pair of roots to reduce the order of the polynomial by two. An 8K version contains all the above parts in one program.

Minimum Hardware: 4K PDP-8
Restrictions: Delete extended functions for 4K version
Source Language: FOCAL-69

NOTE: When ordering please state whether 4K or 8K version is required.

DECUS NO. FOCAL8-69

Analysis of Variance

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

This program is designed to solve the analysis of variance problem for the two-factor completely randomized design, and to table the results of the analysis in a form acceptable for publication in many scientific journals. Both the input and output formats are designed for simplicity and ease of operation.

An alternate form of the program makes possible the evaluation of either one-factor or two-factor designs.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-70

Analysis of Variance Randomized Block "F" Test

C. T. Lund, Canada Department of Agriculture, Vineland Station, Ontario, Canada

The purpose of this program is to isolate variation in an experiment attributable to treatments and replicates, and test this variation for significance.

Minimum Hardware: PDP-8/L, ASR33
Restrictions: The block design must be complete
Source Language: FOCAL 1968

DECUS NO. FOCAL8-71

FOCAL Golf Program for the PDP-8 (8K) Computer

Gilbert S. Fair, Digital Equipment Corporation, Northbrook, Illinois

This program simulates the playing of golf, including the shot selection options of club, power and direction together with numerous variations of these selections, to more closely resemble the actual experience of a golfer "on the links."

Minimum Hardware: 8K PDP-8, ASR33
Storage Requirement: 7000-8000 words (including FOCAL)
Miscellaneous: Takes about one hour for 9 holes (dependent on user reaction)
Source Language: FOCAL -69

DECUS NO. FOCAL8-72

General Least Squares Fit

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

Can be used to fit data to any arbitrary curve (line, exponential, polynomial, Gaussian, Lorentzian, etc.). Curve is specified by the calculation in group 3, so any curve that can be calculated can be fitted to data.

Minimum Hardware: 8K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-73

Real Matrix Inversion

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

Inverts a real, square matrix using FOCAL. This is essentially a translation of the IBM MINV.

Minimum Hardware: PDP-8
Restrictions: 6 x 6 matrix is the largest that can be done with 4K
Source Language: FOCAL

DECUS NO. FOCAL8-74

Linear Least Squares Fit

Harold Metcalf, SUNY Stony Brook, Stony Brook, New York

A short, fast simple linear least squares fit (linear regression).

Source Language: FOCAL

DECUS NO. FOCAL8-75

Blackjack

Jerry D. Burns, Exotic Environments Laboratory, Arizona State University, Tempe, Arizona

A modified Blackjack game, written in FOCAL. The game contains standard Blackjack payoffs as well as a "double down" option on hands of 10 or 11.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-76

Screening Regression

Dr. Robert G. Miller, 30 Juniper Lane, Glastonbury, Connecticut

This program performs a stepwise multiple linear regression analysis. For a dependent variable Y the program selects or screens from among a number of independent variables a subset (7 or less) of the total number of variables which contains most of the information of the entire set. There is no limit to the number of independent variables used.

Minimum Hardware: PDP-8/L, ASR33
Storage Requirement: 4096 words
Restrictions: The cross product matrix is required as input
Source Language: FOCAL - 69

DECUS NO. FOCAL8-77

MARX: A Grading Program

Peter Smith, Noble and Greenough School, Dedham, Massachusetts

This program accepts marks for a class of a given number, for a given number of weighted quizzes and tests, and outputs in tabular form, the students' respective ranks, averages, and relation to the class average (plus or minus, as the case may be). In addition, it gives the class average, and a table showing the distribution of averages along a scale from flunk (below 60) to 100.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-78

RACK-O

Daniel Miller, 30 Juniper Lane, Glastonbury, Connecticut

A computerized version of the Milton Bradley Company game RACK-O. The object is to try to put a "set" of numbers in numerical order (limitations are put on your changes) before the machine does.

Minimum Hardware: PDP-8, ASR33
Other Programs Needed: Pseudo random number generator (special binary tape for this program)
Source Language: FOCAL - 69

DECUS NO. FOCAL8-79

The Carnival Game

Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

The Carnival Game allows the user to play a gambling game involving three dice. Once started, the program produces a monolog explaining the principle and operation of the game.

Minimum Hardware: PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-80

Using the High Speed Punch with FOCAL

Harold Metcalf, Physics Department, SUNY Stony Brook, Stony Brook, New York

This program enables the use of the high speed punch in FOCAL by direct or indirect command, in much the same way that the asterisk enables the optical reader.

Minimum Hardware: PDP-8, high speed punch
Other Programs Needed: FOCAL - 69
Source Language: PAL III

DECUS NO. FOCAL8-81

FOCAL Lunar Landing Simulation (APOLLO)

James A. Storer
Submitted by: Walter Koetke, Lexington High School, Lexington, Massachusetts

This program realistically simulates an Apollo moon landing using NASA figures. It begins with module at Ø seconds, 120 miles above the moon, carrying 1600 pounds of fuel, with a velocity of 2600 miles per hour. Upon radar checks of velocity, altitude, remaining fuel, and time each 10 seconds, you may decide upon fuel rate for next time arrival. The object is to land safely on the moon.

Minimum Hardware: 4K PDP-8
Restrictions: Cannot retain FOCAL's extended functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-82

Physical Sine Curve Programs

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Consists of:

1) Simple Sine Man; 2) Damped Sine on Axis; 3) Sum Shaded Sines; 4) Plot and two physical sine curves; 5) Fourier Synthesis of a Square Wave.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-83

Gas Law Programs

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Consists of:

1) Ideal Gas Plot P/V; 2) Ideal Gas Volume vs. Temperature; 3) Real Gas Volume vs. Temperature.

Source Language: FOCAL

DECUS NO. FOCAL8-84

2D Plotter for Serial Experimental Data

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program will accept and plot on TTY up to 40 sets of data (in 4K). The printout is organized to display the Cartesian Space by spacing through values of "Y" and line feeding through values of "X" where these may represent any physical quantities. Following the plotting of data, the display scale factor and the adjusted values for the plotter parameter are typed out by calling for the whole symbol table.

The program was designed to serve as a universal plotting routine in its own right, but is group numbered to facilitate incorporation into some other program as a dedicated display routine.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-85

Program Replication

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This is intended as a vehicle for the essential single line 06.01 which specifies the immediate-mode command.

The FOR command will cause the program presently in core to be typed out the specified number of times with the specified number of lines between each copy of the program.

DECUS NO. FOCAL8-85 (Continued)

The search feature was employed to facilitate cutting the TTY paper into individual pages.

The program as provided will make ten copies of itself as soon as it has loaded and the G followed by a CARRIAGE RETURN are read from the tape.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-86

KCF Temperature Conversion Table

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program expands the usefulness of the sample program listed in Introduction to Programming (DEC). Temperature conversion and table printout is available from any starting temperature (6 digit limit), in any size increment, to any higher temperature. The program may be used to generate tables of any range and subdivision for use in the field, or the range of immediate interest may be run as needed in the laboratory.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-87

Keyboard Readable Punch

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program should prove useful to users of paper tape who also have limited core storage. The routine operates manually from the TTY keyboard (LOCAL) to punch readable characters. Using this procedure, the leader portion of the paper tape can be perforated in a meaningful way for tape identification.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-88

Atomic and Molecular Transition Probabilities in FOCAL

Harold Metcalf, Physics Department, SUNY Stony Brook, Stony Brook, New York

This constitutes part of a series of programs for evaluating 3-J and 6-J symbols in the calculation of quantum mechanical matrix elements which was developed at the State University of New York at Stony Brook.

Source Language: FOCAL

DECUS NO. FOCAL8-89

The Recursive Evaluation of Functions

A. K. Head, C.S.I.R.O. Division of Tribophysics, Melbourne, Australia

The evaluation of functions by recursion is a technique which is not often used in computing, but it has proved to be the solution to two different problems in FOCAL. The first was the need for circular functions which were more accurate than the internal functions when using 4-word arithmetic (when the internal functions have only 3-word accuracy). The second was the need for functions which occupy less memory than the corresponding internal functions. A selection of some of the circular and hyperbolic functions which have been used are included in this program.

Source Language: FOCAL - 69

DECUS NO. FOCAL8-90

X-Y Plotter Patch for FOCAL '69

Roy H. Swatzell, Jr., University of Alabama, School of Medicine, Birmingham, Alabama

This routine is designed to give the user point or line plotting capability through the FOCAL Interpreter.

Minimum Hardware: PDP-8, ASR33, X-Y Plotter (Digital)
Other Programs Needed: FOCAL - 69, BIN Loader
Storage Requirement: 111_8 locations (in FOCAL)
Restrictions: This routine replaces the arctangent and log routines in FOCAL
Source Language: PAL III

DECUS NO. FOCAL8-91

Multiplication of Rectangular Matrices

Carl Bryant
Submitted by: Brother John F. O'Connell, St. John's Preparatory School, Danvers, Massachusetts

This is the author's answer to the suggestion made in DECUS NO. FOCAL8-33 that someone generalize the program to include multiplication of rectangular matrices.

Source Language: FOCAL - 69

DECUS NO. FOCAL8-92

FOCAL Horserace for the PDP-8 (8K) Computer

Gilbert S. Fair, Digital Equipment Corporation, Northbrook, Illinois

This program simulates a horserace with 9 horses, using a random number generator to produce different results for each race run, and permitting 20 or so bets to be placed on each race.

DECUS NO. FOCAL8-92 (Continued)

Minimum Hardware: 8K PDP-8, ASR33
Storage Requirement: 7000-8000 words (including FOCAL)
Source Language: FOCAL - 69

DECUS NO. FOCAL8-93

Dose-Response Routine

Rudolph H. deJong and Roger A. Nace, University of Washington School of Medicine, Seattle, Washington

The S-shaped log dose-response curve, widely encountered in biomedical analysis, is transformed to a straight line by probit conversion. This program outputs log dose and probit values for subsequent plotting on linear graph paper. The expanded program for 8K systems adds a plotting routine that outputs a scattergram on automatically scaled coordinates.

Minimum Hardware: 4K or 8K PDP-8
Restrictions: 4K FOCAL has no plot
Source Language: FOCAL - 69

DECUS NO. FOCAL8-94

Multidimensional Integration by Gaussian Quadrature

H. Bradford Thompson, University of Toledo, Department of Chemistry, Toledo, Ohio

A subprogram provides multidimensional integration of a known function by Gaussian quadrature. The user may define the function, integration limits, and number of points used. Gaussian quadrature is valuable within FOCAL because of its low error for a limited number of calculated points.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL - 69

DECUS NO. FOCAL8-95

One-Armed Bandit

James J. Ward and Larry A. Owens, Digital Equipment Corporation, Maynard, Massachusetts

This is a demonstration of the PDP-8 as a slot machine.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL - 69

DECUS NO. FOCAL8-96

Statistics - Standard Deviation

E. W. Coleman, Picker X-Ray Manufacturing
Submitted by: E. F. Steinfeld, Digital Equipment Corporation, Pittsburgh, Pennsylvania

Accepts any number of data values from the keyboard or from paper tape, computes and prints out mean, variance, standard deviation, coefficient of variation, maximum data value, minimum data value, and number of data points.

Minimum Hardware: PDP-8, ASR33 (high speed reader optional)
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-97

Multiple Equation Graphing on a Teletype

R. Bradford Malt, Wellesley High School, Wellesley, Massachusetts

This program graphs up to 9 equations simultaneously on an ASR33 or similar teletype. It requires only one type head pass per line, providing considerable speed. Provisions are made for error condition checks, and correction of specification overflow is automatic.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-98

FOCAL PUNCH OVERLAY

James J. Chang, Department of Chemistry, University of California at Berkeley, Berkeley, California

FOCAL PUNCH OVERLAY permits the FOCAL user to use the FOCAL "Write" command to punch out indirect programs on the high speed punch. The overlay self-destructs after use and must be reloaded to be used again.

Minimum Hardware: PDP-8, ASR33, high speed punch
Other Programs Needed: FOCAL-69
Source Language: PAL III

DECUS NO. FOCAL8-99

3 Dimensional TIC TAC TOE (3X3X3)

Leonard Fertuck, Saskatoon Research Council, Saskatoon, Saskatchewan, Canada

This program plays a game of 3 dimensional Tic Tac Toe in which the object is to maximize the total number of lines when all cells in the 3X3X3 cube have been filled. Game rules and operating instructions are provided as comments in this program.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-100

Additions to FOCAL W

Alan S. Fields, Naval Ship Research and Development Laboratory, Annapolis, Maryland

These are additions to FOCAL W, of 8/68, for both 4 and 8K systems. Assembly language listings are included as Appendices.

DECUS NO. FOCAL8-100 (Continued)

Appendix 1 gives the simple patch required to permit group numbers to go up to 31.99 rather than 15.99. This may be useful only with 8K. Included in Appendix 1 is the symbol table used by PAL-3 for all the additions.

Appendix 2 gives a simple routine which on repeated calls turns the echo on and off. This simplifies "read-in" of data tapes if only a low speed reader is available. The routine uses the DXS function slots in the tables. Systems with scopes will have to provide a change. The routine occupies unused locations in the floating point package.

Source Language: FOCAL 8/68

DECUS NO. FOCAL8-101

"HORSERACE"

William Garcia, Jr., Dow Badische, Freeport, Texas

Simple, but a very exciting horserace, based on the frequency of numbers generated. Ten decimal numbers, 0-9, are used for a better distribution. The highest frequency at which a number appears is paired with that of the lowest frequency.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 1968

DECUS NO. FOCAL8-102

Solution of Quadratic Equations with Complex Coefficients

Forrest Howard
Submitted by: Brother John F. O'Connell, C.F.X., St. John's Preparatory School, Danvers, Massachusetts

The principle basis of this program is from the discussion of quadratic equation with complex coefficients in INTERMEDIATE MATHEMATICS, PART II (SMSG, Yale University Press, 1961), Section 12-5, pp. 707-710. To get around the difficulty of working with the definition of

$$i = \sqrt{-1}$$

since the computer will reject the square root of a negative number, the rectangular form of $z = a + bi$ is converted to the polar form for the operations upon z and then back to the rectangular form for the output. The theorem included in the reference mentioned above indicates that some problems will have two solutions, while others will have only one. The example problems included with this program indicate that this is quite so.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL-69

DECUS NO. FOCAL8-103

TEACH

Edward Steinfeld, Digital Equipment Corporation, Pittsburgh, Pennsylvania

This is an example of what could be accomplished in the computer aided instruction realm. TEACH is only a sample and does not carry the student beyond the first hour of instruction. The program is divided into three sections: First, the instruction segment; Second, six problems with answers but no explanation; the third section is comprised of an explanation and six problems, with the option to continue or stop.

Minimum Hardware: 4K PDP-8
Restrictions: No functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-104

The Towers of Hanoi

Dr. Roger H. Abbott, Department of Zoology, Parks Road, Oxford, England

This program uses a recursive routine to solve the Towers of Hanoi problem. Either the total number of moves and the time required, or the actual moves, will be typed on the teletype. It is intended as a demonstration of the way in which recursion may be used in FOCAL.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-105A

LAB-8 Extended Functions for FOCAL (4K)

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

These replace the standard extended functions, to give the LAB-8 user greater flexibility in interacting with the AXØ8 through FOCAL, thereby simplifying the programming of certain applications which otherwise would only be possible in assembly language.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69
Source Language: PAL 1Ø Version 141

DECUS NO. FOCAL8-105B

LAB-8 Extended Functions for FOCAL (8K)

Richard Rothman, Digital Equipment Corporation, Maynard, Massachusetts

This adds many more functions of general usefulness to those already implemented in the 4K version. The write-ups for both versions are combined in one document, but the tapes may be ordered separately.

DECUS NO. FOCAL8-105B (Continued)

Minimum Hardware: 8K PDP-8
Other Programs Needed: FOCAL-69
Source Language: PAL III Version 141

DECUS NO. FOCAL8-106

FOCAL Traveling-Wave Sketches

Arthur L. Pike, Tufts University, Department of Electrical Engineering, Medford, Massachusetts

This program sketches graphs of the following wave expressions:

$$i(y,t) = A\varepsilon^{\alpha y} \sin(10\pi t - \beta y) = \mathrm{Im}(A\,\varepsilon^{(\alpha + j\beta)y}\,\varepsilon^{j10\pi t})$$

In this equation, angular frequency $\omega = 10\pi$ radians per second, and propagation constant $\underline{r} = \alpha + j\beta$; the components of $\underline{r}$ are positive for an incident wave, with negative values for a reflected wave. Phase constant β is fixed by the program at $\pi/2$, thereby fixing the phase wavelength at:

$$L = \frac{2\pi}{\beta} = 4 \text{ units}$$

Thus, a value of $t = 0.1$ corresponds to π radians in the phase angle. Hence, with $t = 0.05$, the corresponding angle is 90°. Amplitude A is scaled by the program so that the maximum amplitude of any wave will tie in the sketch space.

Source Language: FOCAL-69

DECUS NO. FOCAL8-107

NIM

Kenneth McCord, Highland Park High School, Highland Park, Illinois

The game of NIM consists of three columns of coins where the number of coins in each column is different. The object of the game is, by alternating turns with the computer, to remove all the coins from the playing board. The one who removes the last coin or coins is declared the winner.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL with extended functions deleted. Also delete "=" sign
Source Language: FOCAL-69

DECUS NO. FOCAL8-108

Analysis of Variance for Two-Dimensional Material

Lars Palmer, AB Hässle, Pharmacological Laboratory, Goteborg, Sweden

This program calculates the standard analysis of variance table for a two-dimensional analysis of variance with the same number of replications per group.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-109a

Program to Find Real Roots of a Polynomial Equation of Degree N (an integer) With Real Coefficients

Jeff Gelpey
Revised by: Brother John O'Connell, C,F.X., St. John's Prep School, Danvers, Massachusetts

This program uses the NEWTON-RAPHSON method to find the real roots of a polynomial equation of degree N with real coefficients. It has the usual limitations of the above method, but has worked well for a large number of problems found in Calculus and Elementary Functions textbooks.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL '69

DECUS NO. FOCAL8-110a

SWAP - FOCAL Disk Data Overlay

James J. Chang, University of California at Berkeley, Chemistry Department, Berkeley, California

This overlay causes the 8K FOCAL interpreter to use the last two tracks of a DF32 disk for the storage of variables. The number of variables which may be used in an 8K system is changed from over 100 to well over 600 variables. Program execution time is, however, severely increased.

Minimum Hardware: 8K PDP-8/I, DF32 disk
Other Programs Needed: FOCAL, 1969 (DEC-08-AJAE-PB) and utility overlays (DEC-08-AJ1E-PB)
Restrictions: Only works with this version of FOCAL and overlay
Source Language: PAL, MACRO

DECUS NO. FOCAL8-111

Battle of Numbers Game (Newberry College Version)

Edward D. Huthnance, Newberry College, Newberry, South Carolina

The program allows the user to play Battle of Numbers against the computer. The computer usually wins.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-112

TIC-TAC-TOE (FOCAL)

Doug Wilson and Mark Linehan
Submitted by: Mr. C. Hamblet, Governor Dummer Academy, Byfield, Massachusetts

Two versions of this program are supplied. The first may be used with or without extended functions in core. It provides only the basic game logic, with minimal teletype messages. The second must be used without the extended functions in core. It has the following features: 1) Each move is shown in the form of a matrix; 2) Operator cheating is detected; 3) A running score is maintained.

Minimum Hardware: 4K PDP-8, ASR33
Miscellaneous: In both versions, the computer always makes the first move
Source Language: FOCAL-69

DECUS NO. FOCAL8-113

Acid--Base Titration Curves

Edgar H. Nagel, Valparaiso University, Valparaiso, Indiana

This program is designed to construct a titration curve for the titration of a weak acid (0.1M initial concentration) with 0.1M strong base. The acid may have any number of replaceable hydrogens and the successive pKa values are entered to initiate the plot. The only simplifying approximation is to substitute concentrations for activities.

Minimum Hardware: PDP-8, ASR33
Source Language: FOCAL-69, with extended functions

DECUS NO. FOCAL8-114

Liquid Scintillation Data Processing Program

Arnold Fish, Digital Equipment Corporation, Princeton, New Jersey

Routine for calculating DPM, largest DPM value and plotting DPM data given data as a list of values in the format:

SAMPLE No.	TIME	COUNTS A	COUNTS B	COUNTS SUM
SN	T	CA	CB	CS

Source Language: FOCAL-69

DECUS NO. FOCAL8-115

Short Programs for Statistical Analysis Using FOCAL

D. J. Dowsett and R. Priest, Atkinson Morley's Hospital, Wimbledon, England

The package includes: 1) Plotting the Normal Curve for instruction purposes; 2) Calculation of the mean and standard deviation values for a single sample; 3) Student's 't' Analysis; 4) 2 x 2 Chi-squared analysis together with an open ended chi-squared program for testing goodness of fit; 5) Least squares correlation program together with a Spearman-rho correlation by rank; 6) Analysis if Variance for two samples with one criterion of classification.

Although designed for medical purposes there is no reason why these routines cannot be used in other faculties.

Source Language: FOCAL-69

DECUS NO. FOCAL8-116

KV8FT

Arthur L. Pike, Tufts University, Medford, Massachusetts

This patch incorporates a slightly shortened version of the Variable Stroke Character Generator in such a way that FOCAL can branch to VSCG for writing on the 611 scope instead of to XOUTL for writing on the teletype. With this patch, FOCAL can use the scope and high speed punch for writing FOCAL programs and for producing rapid punched output of tables or other lengthy data. With appropriate attention to format this patch allows FOCAL programs to add text labels to graphical constructions that are drawn with the aid of the GRAPH overlay.

Minimum Hardware: 8K PDP-8, KV8/I Display unit
Other Programs Needed: 8K FOCAL patch, FOCAL, GRAPH patch
Source Language: FOCAL-69

DECUS NO. FOCAL8-117

ED-50

Lars Palmer, AB Hässle, Pharmacological Laboratory, Goteborg, Sweden

This is an iterative procedure for a least square fit to the function :

$$Y = \frac{A}{1+B^{\overline{X}}}$$; i.e. the dose-response curve.

Minimum Hardware: 4K PDP-8
Restrictions: Maximum data points c: a 30
Source Language: FOCAL-69

DECUS NO. FOCAL8-118

Three Mathematical Routines
1. To Raise A+B*I to the N Power
2. Complex Roots of Real Interpreters
3. Cube Root Finder

Forrest Howard
Submitted by: Brother John F. O'Connell, C.F.X., St. John's Preparatory School, Danvers, Massachusetts

1. To Raise a + bi to the Nth Power - This program is based on De Moivre's Theorem for raising complex numbers to a given power N. It works with all integral values of A and B and for A and/or B equal to zero. It seems reasonable to

DECUS NO. FOCAL8-118 (Continued)

assume that it would also work with decimal fractions for A or B. In the illustrative examples the = sign has been deleted to improve the printout of the answers which appear in rectangular coordinate form rather than the trigonometric form.

2. To Find the P Complex Routes of a Real Number N - This program was planned around the geometrical method of finding the cube roots of unity. The printout gives the roots in rectangular coordinate form of the complex number.

3. Cube Root Finder - This program gives a very good approximation of the cube root of real numbers.

Minimum Hardware: 4K PDP-8/S
Source Language: FOCAL-69

DECUS NO. FOCAL8-119

CHEMS LAB 5

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

Among the "new breed" chemistry courses designed for secondary application, the 'chemical materials study' (CHEMS) is a favorite which continues to be adopted, adapted, revised, and rewritten. CHEMS LAB 5 is designed to contrast the energy involved in a phase change with that of a chemical change using very simple materials and equipment. It also provides early experience in quantitative investigation by dealing with the uncertainly of measurement, and the ideas of accuracy and precision.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-120

PFI - Product Form of the Inverse

James H. Christensen, University of Oklahoma, Norman, Oklahoma

Matrix inversion using the product form useful for parametric studies and linear programming, as well as matrix inversion which is economical in terms of time and storage requirements.

Minimum Hardware: Any configuration with FOCAL
Source Language: FOCAL

DECUS NO. FOCAL8-121

Play Golf With Arnold Palmer

David A. Cutler, Lake Michigan College, Benton Harbor, Michigan

Simulates a golf game in which the user acts as caddy for Arnold Palmer and has control over what club he uses after his drive. It makes provisions for trees, water and sand traps. The program tallies the score for easy reference.

Minimum Hardware: 8K PDP-8/I
Other Programs Needed: LIBRA Overlay
Source Language: Multi-user FOCAL

DECUS NO. FOCAL8-122

Charge Account

Frederick W. Holzwarth, George Washington High School, Philadelphia, Pennsylvania

This program is useful in teaching high school students manipulation of subscripted arrays. It also gives academic students an introduction to business application. The data included was taken from one of the types of charge accounts offered by a local department store.

Minimum Hardware: 4K PDP-8/S, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-123

LOAD Command for FOCAL-1969

Edward Steinfeld, Digital Equipment Corporation

LOAD; new command for FOCAL-1969. If you have found that FOCAL is impossible to bomb-out, try this overlay. This command deletes the LOCATIONS command that is used to return control to the DISK Monitor. With LOAD you may change any core location in field Ø by simply typing LOAD LOCATION/CONTENTS using two four digit octal numbers.

Minimum Hardware: PDP-8
Other Programs Needed: FOCAL-69
Restrictions: Deletes use of LOCATIONS command
Source Language: PAL-D

DECUS NO. FOCAL8-124

Analysis of Variance Package

W. P. Ronald, Canada Department of Agriculture, Vancouver, British Columbia, Canada

This package contains two programs, a one-way analysis and a two-way analysis with block effects. In both cases, the initial output consists of single sample statistics. These are followed by an analysis of variance table and an F ratio. The analysis of variance tables produced by these programs may be used with an F test, such as Scheffe's or Duncan's to deter-

DECUS NO. FOCAL8-124 (Continued)

mine whether any significant differences exist between group means.

Restrictions: Requires deletion of extended functions
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-125a

Magtape Formatter for MTA Handler

John Alderman, Applied Data Research, Atlanta, Georgia

This creates the formatted magtape required for use with DECUS NO. 8-391, MTA Handler for PS-8. The program is started by a 'GO' and the tape length is entered by the operator. A formatted tape is then created, complete with zeroed directory, ready for use with the handler.

Minimum Hardware: 8K PS-8 System configuration, TC-58/TU-20 (7 track) IBM Compatible tape unit
Other Programs Needed: FOCL.S (DECUS NO. FOCAL8-148
Source Language: FOCL.S (DECUS NO. FOCAL8-148

DECUS NO. FOCAL8-126

PLOTTER

John W. Smith, Indiana University, Department of Anatomy and Physiology, Bloomington, Indiana

Allows one to utilize the teletype to plot a wide variety of equations (Y=F(X)). The equation is entered as a FOCAL 'SET' command. The program asks the limits of X and generates scaling information to place all data on the graph with maximum resolution. F(X) may include all the FOCAL functions.

Minimum Hardware: 4K PDP-8
Storage Requirement: 145 locations left (QUAD with extended functions)
Source Language: FOCAL-69

DECUS NO. FOCAL8-127

FOCAL-SLOT

F. R. Johnson, Dow Badische Company, Freeport, Texas

FOCAL-SLOT is a demonstration program which allows the operator to simulate playing a slot machine.

By repeated use of FRAN ( ) a three digit number is generated. Each digit is evaluated and the proper special character is printed. Operation is continuous until break out by a CTRL/C.

Minimum Hardware: 4K PDP-5/8
Source Language: FOCAL 1968

DECUS NO. FOCAL8-128

Probability (2P); From t ("Student") Distribution

Milton Landowne, M. D., U. S. Army Institute of Environmental Medicine, Natick, Massachusetts

Calculates probability that a difference between means is due to chance, when given the number of degrees of freedom and the ratio (t) of the difference between means and the standard error of this difference.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL-69

DECUS NO. FOCAL8-129

FOCAL Readable Punch

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The operating program consisting of groups 1 and 2 will punch tape-high readable characters using the low speed punch. Groups 3, 4, 5 constitute the fundamental program which was used to build group 2, and which may be used to change or completely rebuild it.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69
Source Language: FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-130

FLHSTO

R. W. Carter, St. Peter's College, Jersey City, New Jersey

FLHSTO is a focal program which first provides a "tight" loop which gathers and counts data values while storing only unique entries. A frequency table and display follow second, and a histogram follows third and last. If storage permits, these sections may be used as subroutines.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-131

ZAREA

R. W. Carter and Friedrich A. Graeper, St. Peter's College, Jersey City, New Jersey

After input of two Z segment boundaries and a segment width (tolerance), ZAREA computes by numerical (summation) integration the area of the above segment under the Gaussian curve. Execution time can be decreased by tolerance increases at the expense of accuracy. Tolerance of Ø.ØØ1 or better produce highly accurate results.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-132

CIG-8 MARK II

J. J. Matthews, University of Exeter, Exeter, United Kingdom

CIG-8 is an overlay to FOCAL 1969 for interactive graphics on a non-storage scope. A reasonable refresh rate is obtained through a display file assembled by an integer storage function. Selective modification of the file by FOCAL programs gives interaction. The HSR routine is sacrificed but the rest of FOCAL plus a shortened FCOM, FIN and the F.F.T. function are added.

Minimum Hardware:	8K PDP-8 with VC8/I or equivalent; optional: Disk/Tape Monitor and AD08
Storage Requirement:	All of both fields
Source Language:	PAL-D

DECUS NO. FOCAL8-133

Withdrawn

DECUS NO. FOCAL8-134

1-20 Counting Game

John Ernst, Mary Holmes College, West Point, Mississippi

The program enables the user to play the 1 to 20 counting game with the computer. The game is played by counting from 1-20 using these rules: Players alternate, and each may say one or two numbers in succession, starting where the other player left off. The one who says 20 wins.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL-69

DECUS NO. FOCAL8-135

MODV - Choice

Arnold V. Fish, Digital Equipment Corporation, Parsippany, New Jersey

This overlay provides a modified version of 8K FOCAL-69 in terms of variable storage. It enables FOCAL to automatically store variables in field 1 along with the text which is normally stored there via 8K FOCAL. It gives the user more room in field for user created functions. It provides for software protection of the last page of field 1 if desired.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	FOCAL-69, 8K overlay
Source Language:	PAL-D and FOCAL-69

DECUS NO. FOCAL8-136a

FOCAL, AMITY 73 with FOP 1

Steven J. Roy, Amity Regional Senior High School, Woodbridge, Connecticut

This is an updated version of the original FOCAL, AMITY which was based on Rick Merrill's FOCAL '68 and adapted by Bob Tuttle of Amity RSHS. Several options are offered.

FOP 1, FOCAL Option Package, is an overlay compatible with and made for FOCAL, AMITY 73. It is used to retain or delete functions offered by FOCAL, AMITY 73's initial dialogue. It is particularly useful for installations with only low speed input capability.

Minimum Hardware:	4K PDP-8
Restrictions:	Cannot be used with Disk or Tape Monitor
Source Language:	PAL III

DECUS NO. FOCAL8-137

General Nth Order Regression

Richard W. Ralston, Jr., Olin Corporation, Charlestown, Tennessee

This program does a general Nth order multiple regression on data stored in an FNEW data array. Maximum is 9th order (without logs). Typeout gives coefficients, variances and "F" ratio on each variable, plus total variance and residual variance. The method is Forward Dolittle (see Hunter-Response Surface Methodology).

Minimum Hardware:	4K PDP-8 plus Disk
Other Programs Needed:	Any FNEW array FOCAL for storage of data
Source Language:	FOCAL

DECUS NO. FOCAL8-138

WCXT: The Wilcoxon Matched-Pairs Signed-Ranks Test for Non Parametric Data

G. C. Ongley, Graylingwell Hospital, Chichester, Sussex, England

A "T" test for non parametric data. It compares differences between two samples of paired data for magnitude and direction, large differences being given more weight than small differences.

Source Language:	FOCAL

DECUS NO. FOCAL8-139

Universal Input/Output for FOCAL

John Alderman, Applied Data Research, Atlanta, Georgia

A universal input/output handler for FOCAL has been developed. Of primary interest to those with "odd-ball" hardware configurations, it allows the FOCAL user to execute I/O commands, load external registers, and read them, and test for "skip" conditions, without requiring other assembly language

DECUS NO. FOCAL8-139 (Continued)

patches. The system has many potential uses, and as a teaching/debugging aid for hardware, relieves the unsophisticated user from much of the tedium in I/O testing. Since the PDP-8 and 9/15 have similar I/O command structures, a version for the 9/15 is undoubtedly possible.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL W (8/68)
Restrictions:	Works only with FOCAL W
Source Language:	PAL III

DECUS NO. FOCAL8-140

Withdrawn

DECUS NO. FOCAL8-141

Spanish Language FOCAL

Max M. Burnet, Digital Equipment Corporation, Maynard, Massachusetts

This patch is used to convert all the commands, functions and initial dialogue of FOCAL-69 to the Spanish language. It is provided as a binary tape which is loaded after the first two sections of FOCAL-69 (DEC-08-AJAE-PB).

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL-69 and INIT
Restrictions:	Applicable only to FOCAL-69
Source Language:	PAL III

DECUS NO. FOCAL8-142

Successive Powers of a Matrix

J. A. Peperstraete, Katholieke Universiteit Leuven, Heverlee, Belgium

This program calculates the successive powers of a matrix, up to the highest power the user wants. The program takes never more than three matrices in core, so there is no technical limitation to the highest power the user asks for - however one has to take into account the FOCAL precision of 6 digits and the cumulative effect of rounding-off errors. The order of the matrix is limited to 6 x 6; for matrices up to 9 x 9, the user has to change the output handling command 01.23.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL-69 without extended functions
Source Language:	FOCAL-69

DECUS NO. FOCAL8-143

Repeated Matrix Multiplication

J. A. Peperstraete, Katholieke Universiteit Leuven, Heverlee, Belgium

The repeated matrix multiplication program multiplies an unlimited number of matrices. The intermediary results are typed out only on user's request, so that a considerable amount of time is saved. The user types the input data of all subsequent matrices to be multiplied, at the end he asks the resulting product matrix which is typed out in matrix-like format.

The program detects itself if a new matrix conforms with the result of previous multiplications. The reduced storage volume is the program's major advantage; there are never more than three matrices in core, so, at each moment the total amount of available space (about 85 signed values) has to be divided among these three; e.g. when the previous result is a 3 x 3 matrix, the new matrix may be of order 12 x 3 etc.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL-69 without extended functions
Storage Requirement:	30 lines of FOCAL script
Source Language:	FOCAL-69

DECUS NO. FOCAL8-144

FOCALJ -- DECtape FOCAL-69

James Crapuchettes, Stanford Electronic Labs, Stanford University, Stanford, California

A modified version of FOCAL-69 (8K version) which includes DECtape I/O through the library command. This I/O is for non-file structured data. Also includes a FNEW command to access the data, a modified FADC command for the AF01-A A/D and a clock and an FPUP command to raise and lower the pen on an X-Y recorder connected in parallel to the display.

DECUS NO. FOCAL8-145

FOCAL for Disk and DECtape with Program Chaining

Lloyd B. Robinson, Lick Observatory, University of California, Santa Cruz, California

This version of FOCAL is useful for control of special devices. Special FOCAL commands can call FOCAL language subroutines from DECtape, store integers and variables on disk, and control block by block transfers between disk and DECtape. Up to 16 more special purpose commands can be added to the system in a convenient manner.

Minimum Hardware:	8K PDP-8, KE 8/I Arithmetic, One DECtape and/or DF32 Disk
Other Programs Needed:	Overlays 8K FOCAL-69
Storage Requirement:	0-3177, 4600-7577, 10000-10777, 16600-17777
Restrictions:	DECtape and disk storage ignores the Monitor
Source Language:	PAL

DECUS NO. FOCAL8-146

Zeller's Congruence/Day of the Week

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

A demonstration program in which Zeller's Congruence is applied to calculate the day of the week following input of month, day and year. Input is self-terminating.

Minimum Hardware:	PDP-8
Source Language:	FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-147

Interaction Analysis

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program is designed to accept the numerical input of verbal categories and then output all of the computed dimensions in the literature for interaction analysis by Flanders, Amidon, et al. The skilled user may then compare these dimensions for his own purposes.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	4K or more
Restrictions:	Limited to FOCAL 5/69
Source Language:	FOCAL 5/69 (DECUS NO. FOCAL8-52)

DECUS NO. FOCAL8-148A (4K)

FOCL.S, An Expanded Language for Small Computers, Based on FOCAL

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia
Submitted by: John Alderman

This dialect of FOCAL-69 is intended to be a more powerful superset of FOCAL-69 and is syntactically compatible with it. Additional features include: multiple subscripted arrays; line continuation character; conditional "DO;" computed line numbers; expanded access to internal and external processor environment.

Minimum Hardware:	4K PDP-8 with ASR33
Source Language:	PAL-8

DECUS NO. FOCAL8-148B (8K)

See FOCAL8-148A above

Minimum Hardware:	8K PDP-8 with ASR33
Source Language:	PAL-8

DECUS NO. FOCAL8-149

Checkers

Paul M. Klinkman, North Smithfield Jr. Sr. High School, Woonsocket, Rhode Island

The computer plays a slightly modified version of checkers using this program. The checkers never land on 32 spaces. This saves 32 variables. Because of the strange nature of the board, checkers can't go off one side of the board to the other side.

Restrictions:	Unable to handle multiple jumps
Source Language:	FOCAL-69

DECUS NO. FOCAL8-150

FRAN8

Paul Fingerman, Department of Psychology, State University of New York, Stony Brook, New York

This overlay is a modified version of DECUS NO. FOCAL8-1 which was an adaptation of Brady's random number generator for FOCAL W. It does not replace it. This version was rewritten for FOCAL-69 without extended functions. It is relocatable, and can easily be adapted for use with extended functions.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	FOCAL-69
Storage Requirement:	66_8 locations, relocatable
Source Language:	PAL III

DECUS NO. FOCAL8-151

Fast Matrix Inversion for Real Numbers

Richard Merrill, Digital Equipment Corporation, Maynard, Massachusetts

This program will invert a matrix up to size 17 x 17 of real numbers using modified Gauss-Jordan methods. It is translated from DECUS NO. 8-72.

Minimum Hardware:	8K PDP-8, ASR33
Other Programs Needed:	FOCAL-11 or FOCAL-8 with 8K overlay
Restrictions:	If the error check is omitted, sizable errors will occur
Source Language:	FOCAL-11 (DECUS NO. 11-24)

DECUS NO. FOCAL8-152

Surface Plate Auto-Collimation

E. Welsh and R. Sinwell, Westinghouse Electric Corporation, Cheswick, Pennsylvania

This program is designed to calculate linear deviations of points along various tracks of a surface plate against a reference plane through 3 arbitrary points or linear deviations of points on a machine tool way against a reference line through 2 arbitrary points.

Input data consist of angular deviations in seconds measured by means of an auto-collimator in combination with a plane reflector. Output data consist of linear deviations in micro-inches.

Minimum Hardware:	4K PDP-8/I or 8/L
Restrictions:	Delete extended functions
Source Language:	FOCAL-69

DECUS NO. FOCAL8-153

Two Overlays for FOCAL '69, FEXP-X-P and FLOG

C. Ediss, University of Alberta, Edmonton, Alberta, Canada

This program relocates the FOCAL 69 exponential function into an area of core usually assigned to the high speed reader. Two new commands are also added to this area. The P command allows direct programming of full echo-non echo; the X command allows the removal and replacement of the = and sign in the output format. About 1100 locations are free to the FOCAL user. The log function may be added as an option, and uses 91 locations of FOCAL programming space. Sine, Cos and arctangent functions are not available.

Minimum Hardware: PDP-8, ASR33
Other Programs Needed: RIM, BIN, FOCAL-69 (DEC-08-AJAE-PB)
Source Language: Binary

DECUS NO. FOCAL8-154

8K FOCAL Display

Floor Anthoni, Medical Biological Laboratory, National Defence Research Council TNO, The Netherlands

In computer-graphics it is necessary to be able to display both lines and characters for a good picture. This program will provide these possibilities for the experienced FOCAL user. Two new functions (FX and FDIS) transform information from the FOCAL program to the display routine.

Minimum Hardware: 8K PDP-8, KV 8/I interface

DECUS NO. FOCAL8-155

FACTORS

Peter DeWolf, 1244 Oak Trail Drive, Libertyville, Illinois

This program will calculate the prime factorization of a number, x, and print it, print related prime factor information, give square root of x in a perfect square and give other related information.

Minimum Hardware: 4K PDP-8, ASR33
Restrictions: Extended functions removed; Tested numbers limited to 6 digits
Source Language: FOCAL-69

DECUS NO. FOCAL8-156

Blackjack for FOCAL

Vincent Perriello, Taft School, Watertown, Connecticut

This program was written to emphasize the versatility of the PDP-8 FOCAL while serving as an amusement to new or inexperienced users. It occupies nearly all of the buffer space, with the subscripted "card" variables.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-157

Modifications to TSS/8 FOCAL

Allan B. Wilson, Computer Applications Associates, Houston, Texas

TSS/8 FOCAL modified to provide two new capabilities: Use of arithmetic expressions as targets in branching statements, and disk storage of FOCAL programs. The patches occupy the core areas assigned to the high speed paper tape reader routines, the library command, and the binary loader in standard 4K FOCAL-69, hence, no text or pushdown space in TSS/8 FOCAL is sacrificed with the inclusion of these features.

Minimum Hardware: TSS/8
Source Language: FOCAL-69

DECUS NO. FOCAL8-158

Mileage Program

Carl Kishline, University of Wisconsin, Kenosha, Wisconsin

Computes the average gas mileage from the fuel consumption and distance, after which it will estimate the cost of fuel for a trip of a given length.

Minimum Hardware: 4K PDP-8, ASR33
Miscellaneous: This program will operate on a 7-user FOCAL system and should work on any FOCAL system including 4K with the extended functions

DECUS NO. FOCAL8-159A

Computer Programs in Use in the Water Qualities Division, Vol. 1

Dr. Adrian Demayo, Water Quality Division, Department of Fisheries and Forestry, Ottawa, Ontario, Canada

This is a booklet containing programs AD0001 through AD0008. The first four programs are for Least Square Fit to Various Types of Polynomial Expressions; three programs are for Least Square Fit to a Linear Expression with Two or Three Variables and the last program is for Solutions of a Polynomial Equation.

DECUS NO. FOCAL8-159B

Computer Programs in Use in the Water Qualities Division, Vol. 2

Dr. Adrian Demayo, Water Qualities Division, Department of Fisheries and Forestry, Ottawa, Ontario, Canada

This booklet contains programs AD0009 through AD0014. The first two are for Balance Calculation; one program is for Calculation of Concentration from Auto Analyzer Charts and the last three are Report on Analysis.

DECUS NO. FOCAL8-159C

Computer Programs in Use in the Water Quality Division, Vol. 3

A. Demayo and P. Goulden, Department of the Environment, Ottawa, Canada

These programs, AD0015 and AD0016, are used to calculate the standard curves and the analytical results obtained with a Technicon CSM-6 Auto Analyzer.

Miscellaneous:	These booklets may also be ordered free of charge directly from Dr. Demayo
Source Language:	FOCAL-69

DECUS NO. FOCAL8-160

Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test

Elliott Gale and Gene Sylwesuik, SUNYAB Department of Behavioral Science, Buffalo, New York

These are statistical programs which allow the user to test the difference between two independent groups (Mann-Whitney) or between two related groups (Wilcoxon) when the data do not meet the criteria for parametric t tests.

Minimum Hardware:	PDP-8/S
Source Language:	FOCAL 8/68

DECUS NO. FOCAL8-161

Wilmot Grading Program

William W. Wilmot, Central Michigan University, Mt. Pleasant, Michigan

The purpose of this program is to average students' grades. It can be used for any number of grades per student. It calculates the average grade for each student, the overall class average, and the class standard deviation.

Minimum Hardware:	4K PDP-8
Restrictions:	Letter grades must be converted to numbers
Source Language:	FOCAL-69

DECUS NO. FOCAL8-162

Transistor H-Parameter Conversions

James A. Williams and Robert E. Werner, Brigham Young University, Provo, Utah

This program will allow the user to convert from one H-parameter to another under control of FOCAL. When the user types "GO" the program will introduce itself and ask questions concerning the type of parameter data one has and the parameter he requires. After the new data is typed out the program will ask questions concerning circuit gain. The value obtained from this calculation is theoretical since all the program requests is a value for RL (load resistance). The program was written under TSS/8 control, but the ASCII tape available may be loaded in the teletype under control of FOCAL. A binary tape is available for users with a high speed reader and the PIP option.

Minimum Hardware:	4K PDP-8 with teletype, high speed reader optional
Restrictions:	Delete all extended functions in FOCAL
Source Language:	FOCAL-69

DECUS NO. FOCAL8-163

Erlang C Blocking Probability Programs

Richard R. Plum, Traffic Systems Engineering Department, Bell Telephone Labs, Inc., Holmdel, New Jersey

Three programs are offered: The first computes the Erlang C Blocking Probability; the second computes the Erlang C Blocking Probability and the average delay in seconds; the third computes the Probability of a delay greater than 10 seconds in addition to the above.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL-69

DECUS NO. FOCAL8-164

Four New Functions for FOCAL 5/69

Vincent E. Perriello, Taft School, Watertown, Connecticut

This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52) enables four new functions that make FOCAL more user-oriented than ever. With the aid of these additions the user can tailor FOCAL to his own needs. They give the ability to write or call subroutines in core, read the switch register and read from any core location, an aid in debugging. This patch wipes out FADC, FDIS, FDXS and FNEW.

Other Programs Needed:	FOCAL 5/69 (DECUS NO. FOCAL8-52)
Storage Requirement:	31_8 locations
Source Language:	PAL-D

DECUS NO. FOCAL8-165

F- (Variance Ratio) Distribution Probability

Alan S. Fields, U. S. Naval Ship Research and Development Laboratory, Annapolis, Maryland

For X_1^2 and X_2^2. independent random variables following chi-square distributions, with V_1 and V_2 degrees of freedom, the distribution of $F = \frac{X_1^2/V_1}{X_2^2/V_2}$ follows the variance ration distribution. The probability that F occurred by chance, a

DECUS NO. FOCAL8-165 (Continued)

measure of effectiveness of the experiment, is calculated.

Minimum Hardware: PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-166A & B

First and Second Order Partial Correlations

Dr. William Wilmot, Central Michigan University, Mt. Pleasant, Michigan

Program A computes the three first order partial correlations for three variables. User supplies the zero-order correlations between the three variables. In program B the user supplies the correlations between the four variables and the program calculates the second order partial correlations between the four variables.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-167

Five Statistical Programs for the PDP-8 or PDP-12

Stephen J. Mayor, Medical College of Ohio at Toledo, Toledo, Ohio

This package consists of five statistical programs. Since there is insufficient storage space for data if the programs are chained together and fed into a machine with only 4K of core, each tape may be ordered separately. However, if sufficient core is available, these programs may easily be chained together using FOCAL since none of the instructions in any of the programs occupy the same line number. The programs are: 1) Student's t Test; 2) Dunnett's t Test; 3) Normalized Plot Routine; 4) Mean and Standard Deviation; 5) Analysis of Variance for Single Variable of Classification.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-168

One-Armed Bandit - PDP-8 Style

Frank R. Borger, Michael Reese Hospital, Chicago, Illinois

One-Armed Bandit lets the player operate the computer as a slot machine. The computer "spins the wheels," checks for wins, and keeps a total of the player's wins or losses. This is similar to DECUS NO. FOCAL8-95 and FOCAL8-127. DECUS would be interested in user feed-back as to which program is superior.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-169

FOCAL Version of the GE Basic Artillery Game

Ronald A. Wong, Edmund Wong, 660-44th Avenue, San Francisco, California

In most computer games the situation is the player versus the computer. However, in this game, the computer is just measuring the skill of the player -- by testing his ability with an artillery piece in coming within 100 yards of a target, whose distance was randomly selected.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69 with extended functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-170

Saint Peter's College Statistical Package

Professor Robert W. Carter, Saint Peter's College, Jersey City, New Jersey

This package contains 8 programs for statistical analysis with FOCAL. The tape for each application may be ordered separately or the complete package may be ordered as one unit. All write-ups are included in one document. The programs and their applications are as follows:

FOCAL8-170.1 FLGPLT - Plots scaled frequency distributions
" .2 FLBIND - Computes binomial probability Distributions
" .3 FLPCTL - Computes percentile scores
" .4 FLSDEV - Computes means and related measures
" .5 FLHMES - Computes "H," the information measure of noise
" .6 FLTMES - Computes "T," the information measure of relationship
" .7 FLPEAR - Computes a Pearson linear correlation and regression analysis
" .8 FLSPER - Computes Spearman's rank-order correlation coefficient

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-171

Minnesota Sociology Statistics Programs

Philip M. Voxland, Department of Sociology, University of Minnesota, Minneapolis, Minnesota

The program package consists of a series of small statistical analysis programs of interest to behavioral science researchers. Various parametric and non-parametric statistics are calculated for nominal, ordinal, interval, and ratio level measurements, for discrete and continuous data and for raw data, grouped data and tabular data.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69
Source Language: FOCAL 69

DECUS NO. FOCAL8-172

XPON

David A. Moon, Wayland High School, Wayland, Massachusetts

The purpose of XPON is to calculate integer powers of positive integers with more than the usual seven digits of precision in FOCAL. As the result is computed, it is divided into groups of five digits. Each group occupies a FOCAL variable. The method of exponentiation is repeated multiplication.

Restrictions:	The base and the exponent must both be integers
Source Language:	FOCAL

DECUS NO. FOCAL8-173

APOLLO II

David A. Moon, Wayland High School, Wayland, Massachusetts

This is a greatly improved version of the Apollo simulation game which has been running on almost every timesharing system in the country. The user is pilot of a lunar module, which he can steer in two axes. It is free to move up and down, and parallel to the lunar surface. The user must control attitude thrusters and the descent engine by typing in numbers. The program reports time, range to landing site, attitude, velocity components, fuel reserves, etc. every 5 seconds of simulated time. A small random error is introduced into these figures to simulate real conditions. After the module reaches the lunar surface, the program reports on its condition and makes remarks about the pilot's skill. This version of Apollo has been found to be considerably more challenging than the version which permits only vertical motion, since there are far more variables to control.

Minimum Hardware:	PDP-8 with Disk (must be able to run LIBRA)
Other Programs Needed:	FOCAL-69 (DEC-08-AJAE), LIBRA (DEC-08-AJ5E or DEC-08-AJ6E)
Storage Requirement:	Two library blocks (1400 words)
Source Language:	FOCAL-69, LIBRA

DECUS NO. FOCAL8-174

SYNDIV 5

David A. Moon, Wayland High School, Wayland, Massachusetts

SYNDIV 5 permits synthetic division of m-polynomial by n-polynomial. The user is requested to type in the coefficients of two polynomials. The first is divided by the second, and the coefficients of the quotient and remainder are printed. On input or output the "*X↑n" associated with the coefficient is supplied by the program. The degrees of both the dividend and the divisor may be from 1 to 9 with the extended functions still in core. A translation into a dialect of APL is included.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL

DECUS NO. FOCAL8-175

Modifications and Supplement to FOCAL8-50
RC Active Filter Design and Plot and 3-Pole Butterworth Filters

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

As in FOCAL8-50, the filter design and plot portion of this program are separate parts - a computation program and a graphing program. The computation program allows: a) speedier execution, b) format, c) self reinitialization, which allows several passes at a design. The modifications to the graph program consist of: a) removal of a bug, b) format, c) simplification of coding. These two parts cannot both fit into FOCAL's user area and hence must be used one at a time. The 3-Pole Butterworth Filters portion of the program scales the normalized designs by Kerwin in Huelsman's Active Filters (McGraw-Hill, 1970) to meet the parameters of the user.

Minimum Hardware:	4K PDP-8 and TTY
Other Programs Needed:	FOCAL, 1969 with extended functions
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-176

Program for Producing Histograms from Clinical Data on Teletype

Eddy Emons, Royal Postgraduate Medical School, Hammersmith Hospital, London, England

This program uses data from the Hypertension Clinic, which are blood pressure measurements taken from patients in the lying and upright positions respectively. Both the systolic (upper) and the diastolic (lower) pressures are recorded for each position.

FOCAL is used with all the extended functions erased. The data are recorded with the high speed reader and stored in a two dimensional array in field one via the integer overlay FNEW. For each pressure measurement, the mean and standard deviation are computed.

From the two dimensional array stored in field one another two dimensional array is computed and stored in field zero, representing the histogram data. FOCAL then scans through each array and types the histogram on the teletype.

Minimum Hardware:	8K PDP-8/I, high speed reader
Other Programs Needed:	FNEW integer overlay
Storage Requirement:	Program: 515 locations; data field one: 3900; field 0: 566 locations
Restrictions:	Extended functions are deleted
Source Language:	FOCAL-69

DECUS NO. FOCAL8-177

PS/8 FOCAL, 1971

David Schneider and Barry Smith
Submitted by: Hartwell H. Whitney, Jr., Oregon Museum of Science and Industry, Portland, Oregon

PS/8 FOCAL, 1971 is a modified version of FOCAL, 1969 for use with PS/8. It provides device-independent library commands, data file manipulations, recursive subroutine calls and chaining to other programs, character manipulations, computed line numbers, and other features.

A LINCtape version is available for PDP-12 users.

Minimum Hardware:	PS/8, 8K and mass storage device, 64K disk or DECtape
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. FOCAL8-178

Motion Picture Package

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This is a package of six short FOCAL routines which should prove useful to those in the motion picture industry. It consists of: 1) 16 mm Motion Picture Theater Optimization, 2) Motion Picture Scaling Program for Special Effects, 3) Running Time Program for Professional Motion Picture Films, 4) Movie Theater Lens Selection Program, 5) Cine Lens Depth of Field and Hyperfocal Calculations, 6) Footage-to-Time Conversion Program for 16 mm, 35 mm and 65/70 mm Cine Films.

Minimum Hardware:	4K PDP-8 with TTY, or any configuration equipped for FOCAL
Storage Requirement:	4K
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-179

Depth of Field Program for Still Camera Lenses

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

In order to insure sharp focus in their photographs, amateur and professional photographers need to determine the depth of field of their lenses for particular settings. This program is based upon the assumption that an acceptable circle of confusion has a constant relation to the lens EFL.

Minimum Hardware:	4K PDP-8 with TTY
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-180

FOCAL-SORT

F. R. Johnson, Dow Badische Company, Freeport, Texas

This is a short routine to sort subscripted arrays by pair interchange. If duplication is found in array(x), then corresponding two elements in array (y) are sorted into ascending order.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL-1968
Restrictions:	Inefficient for arrays of greater than 20 elements
Source Language:	FOCAL-1968

DECUS NO. FOCAL8-181

Filter Design

Ronald Zane, Institute for Astronomy, University of Hawaii, Honolulu, Hawaii

Filter Design is a program for the design of five passive filters:

1. Constant K High Pass Filter
2. Constant K Low Pass Filter
3. Bridged T Notch Filter
4. Parallel T Notch Filter
5. Lumped Parameter Constant K Delay Line

On line interaction with the program facilitates a compromise between operational parameters and available components.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-182

First Order Differential Equation: Initial Value Problem

Algorithm by Runge-Kutta
Submitted by: U. K. Shivadev, Harvard University, Cambridge, Massachusetts

This program, which offers the 4th order Runge-Kutta method of solving a first order non-linear differential equation, is self-explanatory. Initial value, step size and termination point are to be specified. Results are typed at specified intervals.

Minimum Hardware:	8K PDP-8/E, ASR33
Source Language:	8K FOCAL '69

DECUS NO. FOCAL8-183

DARTS

D. W. Robert, COMPRITE, LTD., Boreham Mill, Warminster, Wilts., England

This game allows a number of players to play 301 DARTS according to English rules. The darts never fall out of the board.

DECUS NO. FOCAL8-183 (Continued)

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-184

Manpower

C. C. Wilton-Davies, Royal Naval Physiological Laboratory, Alverstoke, Gosport, Hants, England

This is an interactive program for allocating manpower between a number of jobs with different deadlines. The costs of different solutions may be compared, and options of overtime, hiring and firing are available.

Minimum Hardware: 8K PDP-8
Other Programs Needed: 8K FOCAL
Source Language: 8K FOCAL '69

DECUS NO. FOCAL8-185

LIFE

C. C. Wilton-Davies, RNPL, Alverstoke, Gosport, Hants, England

This program is a FOCAL version of the game LIFE, attributed to John Horton Conway of the Cavendish Laboratory in Cambridge, England. The computer plays with a matrix of locations, each of which may start as full or empty. Full locations are said to contain "cells" which survive, die or reproduce according to simple laws.

Minimum Hardware: 4K PDP-8 for very limited 4 x 4 matrix, 8K for reasonable size matrix
Source Language: FOCAL

DECUS NO. FOCAL8-186

SUMER (French)

J. F. Champarnaud and F. H. Bostem, Liege, Belgium

This French language version of HAMURABI (the Sumer Game) is available on both paper tape and PDP-12 LINCtape. On the LINCtape, both FOCAL, 8K and FOCAL SUMER lists are included.

Minimum Hardware: 8K PDP-8 or PDP-12
Source Language: 8K FOCAL '69

DECUS NO. FOCAL8-187

Display FOCAL

E. Seliak and W. Martin, University of Melbourne, Parkville, Australia

This program enables FOCAL to plot on the storage tube, in vector mode, under interrupt.

Minimum Hardware: 4K PDP-8, VTØ1 storage tube with KV8/I controller, TTY
Other Programs Needed: FOCAL, 1969
Storage Requirement: 0-7577
Source Language: PAL

DECUS NO. FOCAL8-188

Generating Random Numbers with FOCAL

W. Siegel, K. Whittle and J. Siegel, University of Western Ontario, London, Canada

This program provides a patch to correct the problem with FOCAL's random number generator. This routine uses an algorithm developed by Green, Smith and Klem (1959) which has several advantages for use with minicomputers. First, unlike most such generators, it uses an addative rather than a multiplicative process; addition is much faster than multiplication with most machines. Second, the routine is relatively short and third, it has been documented and tested and its characteristics are known. A listing for the patch for FOCAL-12 is provided, but other versions of FOCAL may be modified with similar changes. Three short general programs are included which type out sequences of random integers.

Minimum Hardware: PDP-8 or PDP-12
Other Programs Needed: FOCAL, FOCAL-12
Source Language: Assembly Language

DECUS NO. FOCAL8-189

8K Overlay Patch for FOCAL5/69 (DECUS NO. FOCAL8-52a)

Magnus Lundin
Submitted by: Lars Palmer, AB Hassle, Goteborg, Sweden

This patch corrects some bugs in FOCAL 5/69. The changes include: 1. No line feed generated when printing a CR in character mode. 2. CTRL/C given during high speed punching no longer causes FOCAL 52a to hang in the interrupt routine. 3. CTRL/L is ignored during data input. 4. 8K patch corresponding to 8K patch for FOCAL '69. 5. Hello command corresponding to: OT, I, E, : S; E; EA;. 6. A visual indicator in line Ø if extended functions are in core. 7. Space is created in the library lists for additional library commands. 8. ADC and display routines are removed.

Minimum Hardware: 8K PDP-8/E, HSP (Can easily be rewritten for other PDP-8 computers
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: PAL

DECUS NO. FOCAL8-190

Patch to Add LABEL Feature to FOCAL 5/69 (DECUS NO. FOCAL8-52a)

Magnus Lundin
Submitted by: Lars Palmer, AB Hassle, Goteborg, Sweden

This patch adds LABEL (DECUS NO. 8-68a) in a slightly modified version to FOCAL 5/69 in such a way that it can be reached from keyboard by a new library command. The program is stored in field 1, beginning at 71ØØ and can be removed by another library command if all of field 1 is required for large programs.

Other Programs Needed:	DECUS NOs. FOCAL8-52a and FOCAL8-189
Source Language:	PAL

DECUS NO. FOCAL8-191

Reverse Overlay for FOCAL, 1969

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This overlay can be used to convert 4-word (10 decimal place) FOCAL back to normal 3-word (6 place) FOCAL.

DECUS NO. FOCAL8-192

Echo Change for FOCAL, 1969

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This is a patch for one-user FOCAL, 4K or 8K, to allow killing (and restoration) of echo by typing an asterisk (*) followed by a carriage return. The High Speed Reader routine in FOCAL is sacrificed when this patch is used. No user or function storage is taken.

DECUS NO. FOCAL8-193

Anova, 2-way, Unsymmetrical

Lars Palmer, AB Hassle, Goteborg, Sweden

This is an analysis of variance program for the two-way classification table. It is a general method to analyze two-way classifications which gives the analysis of variance table and calculated row and column factors for unequal groups and for missing groups.

Minimum Hardware:	8K PDP-8, HSR helpful
Source Language:	FOCAL '69

DECUS NO. FOCAL8-194

Rectangular to Polar Coordination (German)

Frank Dieter Lehmann, Hauni-Werke, Hamburg, Germany

In the original Rectangular to Polar Conversion program (DECUS NO. FOCAL8-39) the polar to rectangular program works very well, but the rectangular to polar conversion works only if $-90^{\circ} < \text{angle} < +90^{\circ}$ which restructs it, this program works for $0^{\circ} \leq \text{angle} < 360^{\circ}$. The short listing is commented in German.

Minimum Hardware:	4K PDP-8, TTY
Source Language:	FOCAL '69

DECUS NO. FOCAL8-195

All Purpose Graphing Program

Mike Viola
Submitted by: Robert T. Cronin, Belmont Hill School, Belmont, Massachusetts

This program can plot almost any type of equation through the three options afforded the user in the program. All graphs are inverted and scaled down so that the entire graph fits on the dimensions given the program. This makes selective enlarging of any graph possible.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL-QUAD
Storage Requirement:	At least 800 FOCAL locations
Source Language:	FOCAL '69

DECUS NO. FOCAL8-196

Fisher's Exact Test

Robert M. Smith, University of Alabama Medical Center, Birmingham, Alabama

This non-parametric technique is used with 2 X 2 bivariate tables when cell frequencies are insufficient for Chi-square tests. The program prints a table with labels and marginal frequencies and an exact probability of occurrence of the frequency distribution.

Minimum Hardware:	4K PDP-8/I, ASR/KSR33
Source Language:	FOCAL

DECUS NO. FOCAL8-197

Self-Teaching Program for FOCAL

Henry R. Bungay, III
Submitted by: T. L. Drake, Clemson University, Clemson, South Carolina

This program teaches elementary features of FOCAL. The concept is to leave the program to try to use the commands. A guide sheet lists statement numbers for convenient reentry into the teaching program. Although the program is used routinely on a PDP-15 it has been tested by the author on a PDP-8. For use with a PDP-8, with a small memory, earlier portions of the program must be erased to provide room for subsequent portions. It would be very easy to modify the program or to use parts of it in other programs.

Minimum Hardware:	4K PDP-8 or PDP-15
Source Language:	FOCAL

DECUS NO. FOCAL8-198

Michaelis-Menten Kinetics

Stan Vivian, University of Manitoba, Faculty of Medicine, Winnipeg, Canada

This is a FOCAL program to provide maximum likelihood estimates of the parameters VMAX and K of the Michaelis-Menten equation. Standard errors and both 95 and 99% confidence limits of the parameters are also provided. Fitted data points and the reciprocals of the estimates are printed out for graphical purposes.

Minimum Hardware:	8K PDP-8, TTY
Storage Requirement:	FOCAL Text: Locations 100-4705 Field 1
Restrictions:	Maximum of 30 data points
Source Language:	FOCAL '69

DECUS NO. FOCAL8-199

Stock Market Game

Ronald Papa, Hamden High School, Hamden, Connecticut

This game simulates buying and selling of stocks based on the exchange's most basic principles. The operator has a choice of three different stocks to deal with. Each is preset and rises and falls randomly within a range of ± 3.5. Starting with $10,000 the player continues until all his money and stocks are lost or until he chooses to stop with whatever 'profit' or 'loss' he has taken.

Restrictions:	No extended functions on PDP-8 series
Source Language:	FOCAL '69

DECUS NO. FOCAL8-200

SIMEQR - 20 Simultaneous Equations in 8K FOCAL

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program provides solutions of as many as 20 linear simultaneous algebraic equations with real-number coefficients. The program also tabulates the input data with row-column labels for efficient verification.

Minimum Hardware:	8K PDP-8/I, ASR33 (Should have high speed reader for paper tape data entry
Other Programs Needed:	8K FOCAL '69 and DECUS NO. FOCAL8-201
Source Language:	FOCAL8

DECUS NO. FOCAL8-201

FOCAL Patch for Function FP, Mod 4B

Arthur L. Pike, Tufts University, Medford, Massachusetts

This patch provides facility in 8K FOCAL for 3-word floating point data storage in Field 1, permitting 596_{10} items to be filed or retrieved under function FP. This put and get operation is an adaptation of DECUS NO. FOCAL8-7 for use with 8K FOCAL, 1969.

Minimum Hardware:	8K PDP-8, ASR33
Other Programs Needed:	FOCAL '69 with 8K overlay DEC-08-AJ1E
Restrictions:	FOCAL statements must be below 4000, Field 1 (See write-up)
Source Language:	PAL III

DECUS NO. FOCAL8-202

Code Generator

Peter DeWolf, 1244 Oak Trail Drive, Libertyville, Illinois

This program will type out a complete Vigenere cipher table, with random first line, for polyalphabetical substitution. It will also type out the corresponding decoding table for ease in use; Both tables, or either one alone, can be typed as many times as desired.

Minimum Hardware:	PDP-8/S, ASR33
Other Programs Needed:	DECUS NO. FOCAL8-52a
Restrictions:	Extended functions out
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-203

Graph Sketching

Peter Cornish, Trinity Grammar School, Melbourne, Australia

This program should prove useful in the study of probability, statistics, areas under curve, etc. After the program is started, the computer asks a number of questions needed to sketch the graph. After the necessary input it then sketches the graph and types the X and Y values for the points plotted.

Minimum Hardware:	PDP-8/L or equivalent
Restrictions:	Can only plot one Y value for any X value
Miscellaneous:	Can be used with FOCAL's extended functions IN
Source Language:	FOCAL '69

DECUS NO. FOCAL8-204

Acid-Base Equilibria

F. R. Johnson, Dow Badische Company, Freeport, Texas

Acid-Base Equilibria will calculate hydrogen ion concentration, hydroxyl ion concentration, pH, and paH based on a variety of inputs.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL 1968
Source Language:	FOCAL, 1968 extended

DECUS NO. FOCAL8-205

Random Walk/Array

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

This program generates and plots a random two dimensional array.

Minimum Hardware:	4K PDP-8, ASR
Other Programs Needed:	DECUS NO. FOCAL8-52a
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-206

FOCAL Generates Binary Patches

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The educational uses of a minimum 4K system dedicated to FOCAL needs a convenient way to punch binary format tape, especially if this is usually in the form of short patches from well documented machine language listings. This program makes use of the convenient special options of FOCAL 5/69 (DECUS NO. FOCAL8-52a) to format and punch leader, trailer, origin and instruction codes, as well as a checksum using the ASR punch.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-207

EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

The single character handling of FOCAL 5/69 is used to output EIA on the low speed punch of an ASCII teletype. A second program formats and lists the NC program for a two-axis 'SLO-SYN' machine controller. It stores the required characters and outputs a finished tape.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions:	Works with 5/69 version of FOCAL only
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-208

A Normally Distributed Random Number Generator in FOCAL

Stan Vivian, University of Manitoba, Winnipeg, Canada

This two line program will provide a normally distributed random number from a population of mean zero and specified standard deviation S. Besides the input standard deviation S, the subroutine uses two variables X and Y. The normally distributed number is returned as X. Another version is provided for use with DECUS NO. FOCAL8-150; it is a single line of FOCAL and executes faster. A demonstration program is also included.

Source Language:	FOCAL '69

DECUS NO. FOCAL8-209

GRFIT, A Simple Least Squares Routine

R. C. Gross, Eastman Kodak Company, Rochester, New York

The program accepts data for x and y, where x is known and y has some degree of scatter in the data, calculates the best straight line, gives a correlation coefficient as well as standard errors for the calculated slope and intercept.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL 1969 or similar
Restrictions:	Best used without extended functions
Miscellaneous:	See also DECUS NO. 8-483
Source Language:	FOCAL

DECUS NO. FOCAL8-210

CHAIN and FCOM

Alessandro Zanon, Instituto Nazionale diFisica Nuclear, Legnaro (padova) Italy

CHAIN - A virtual no-core memory FOCAL overlay chaining FOCAL programs.

FCOM - A new function to store data on common area or on DECtape.

These two complementary programs are written for the use of FOCAL on 4K PDP-8 family computers with the DECtape Monitor System. They are used whenever a series of programs and/or a large amount of data are necessary.

Minimum Hardware:	4K PDP-8, TC01 and two TU55 DECtapes
Other Programs Needed:	FOCAL (DEC-08-AJAE-PB) and DECtape Monitor System
Storage Requirement:	4200-4777
Restrictions:	No Extended Functions, FADC( ) and FRAN ( )
Source Language:	PAL-D

DECUS NO. FOCAL8-211

WEST-KY Four-User FOCAL

C. Davis, L. McGimsey and G. Moore, Western Kentucky University, Bowling Green, Kentucky

This modified version of four-user FOCAL '69 provides a DECtape library facility accessible to all users. A library of approximately 100 FOCAL programs including some FOCAL tutorials, drills, and a variety of programs which are intended for the support of undergraduate science and mathematics

DECUS NO. FOCAL8-211 (Continued)

instruction is included. Machine accounting of terminal usage is optional.

Minimum Hardware:	8K PDP-8/I, DECtape, a machine readable clock such as KW8I or the RC clock in the AXØ8 is highly desirable
Other Programs Needed:	Single user and four-user FOCAL '69 are included
Source Language:	PAL-D and FOCAL

DECUS NO. FOCAL8-212

Automated Terminal Usage Accounting for Four-User FOCAL

G. E. Moore, L. S. McGimsey, C. L. Davis
Submitted by: Chester L. Davis, Western Kentucky University, Bowling Green, Kentucky

Machine accounting of the usage of eight terminals connected to two PDP-8/I computer systems at the Instructional Computer Laboratory of the University of Kentucky has been implemented. Programs for emulating a programmable clock, recording usage data, sorting, storing transaction records on DECtape and summarizing usage are presented.

Minimum Hardware:	8K PDP-8/I, DECtape, machine readable clock such as KW8I or the RC clock in the AXØ8
Other Programs Needed:	Single-user and four-user FOCAL 69 are included in the system
Source Language:	PAL-D and FOCAL

DECUS NO. FOCAL8-213

FOCAL Random Number Generator

Dr. Ronald S. Remmel, Princeton University, Princeton, New Jersey

A short, 6 line routine for generation of random numbers in FOCAL.

Minimum Hardware:	Any machine capable of handling FOCAL
Source Language:	FOCAL

DECUS NO. FOCAL8-214

FDSK, An Overlay for FOCAL to Read Data - Or Program - Files from the PS/8 Systems Device

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

FDSK provides 8K FOCAL with a minimum-core access to a mass-storage device: the PS/8 system-device. It enables the user to process data files (on the system-device) preprocessed by other programs. It can be used to run FOCAL batch-wise.

As FOCAL was used to perform the last step in the processing of data, only a READ on the system-device was implemented. The data transfer is in ASCII format.

Minimum Hardware:	8K PDP-8; 64K Disk or DECtape
Other Programs Needed:	FOCAL '69 8K Overlay; PS/8 Programming System
Storage Requirement:	45_8 locations in Field Ø; 645_8 locations in Field 1
Source Language:	PAL-8, PAL III

DECUS NO. FOCAL8-215

FOCAL 1969 Octyl Loader

F. R. Johnson, Dow Badische Company, Freeport, Texas

This octyl loader will allow the user of FOCAL 1969 to load a tape in octyl format. Using this loader FNEW(X) commands can be loaded without resorting to a binary load and can be used by terminals remote from the computer itself.

Minimum Hardware:	4K PDP-5/8
Other Programs Needed:	FOCAL 1969
Storage Requirement:	63 core locations and a pointer
Source Language:	PAL III

DECUS NO. FOCAL8-216

FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL

Hans Mees and Floor Anthoni, Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands

FARRAY uses Field 1 from top to bottom (competitively with the text area) for the storage of one - or two - dimensional arrays. Arrays can be defined in integer or 3- or 4- word floating point format. Arrays can be created or deleted dynamically during program execution.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	FOCAL '69; 8K overlay; 4 word overlay
Storage Requirement:	106_8 locations Field Ø; 514_8 locations Field 1
Restrictions:	A FARRAY function cannot be called within itself
Source Language:	PAL-8, PAL III

DECUS NO. FOCAL8-217

Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions

U. K. Shivadev, Harvard University, Cambridge, Massachusetts

This program solves any two first order ordinary differential equations simultaneously using Hamming's fourth order algorithm.

Minimum Hardware:	8K PDP-8/E; Paper tape reader

DECUS NO. FOCAL8-217 (Continued)

Other Programs Needed:	DEC-08-LBAA-PM Binary Loader and DECUS NO. FOCAL8-148 FOCL.S 8K
Source Language:	FOCL.S (DECUS NO. FOCAL8-148)

DECUS NO. FOCAL8-218

FOCAL Overlay CHAIN

Herbert Zimmerman, Digital Equipment GmbH, Cologne, Germany

The overlay CHAIN was written to minimize the amount of hardware for the sophisticated usage of FOCAL. Two basic programs are included - a program to build a system tape and to call the various FOCAL-Interpreter configurations, and the overlay CHAIN. The functions of the overlay CHAIN are: a common area in core for integers, 3 word and 4 word floating point numbers; store and fetch of common area on/ from DECtape; a "computed GOTO" function; storage of FOCAL programs on DECtape and chaining of several programs.

Minimum Hardware:	4K PDP-8/E; Single or dual transport TD 8/E
Other Programs Needed:	Binary Loader, FOCAL DEC-08-AJAE-PB, FOCAL 4 word overlay
Storage Requirement:	Approximately 4 pages
Restrictions:	For 4K only, RIM and BIN will be destroyed
Source Language:	PAL-8

DECUS NO. FOCAL8-219

Keyboard Controlled High Speed Punch Routine for FOCAL 1969

Eddy Emmons, Royal Postgraduate Medical School, Hammersmith Hospital, London, England

A new function call has been implemented for FOCAL 1969 to allow the high speed punch to output all FOCAL commands and can be used under program control.

A new command, which is ignored by FOCAL, changes the printer IOT's for Punch IOT's. The Punch will exit to the keyboard when errors occur. These routines can be used with or without the extended functions and do not require extra user space'. Either argument or command can be extended to activate other high speed output devices as KV8/I, line printer, etc. (when 8K is available).

Minimum Hardware:	4K PDP-8, 8/I, 8/L
Other Programs Needed:	FOCAL 1969
Storage Requirement:	50_8 locations
Restrictions:	FDIS and FADC are pre-emptied
Source Language:	PAL-8

DECUS NO. FOCAL8-220

Individual Tablet Assay

L. L. Alber and M. W. Overton, U. S. Food and Drug Administration, Chicago, Illinois

This program was written to process spectrophotometric readings from the laboratory auto-analyzer system. The experimenter performs the analysis in the usual manner and types in the instrumental reading at the computer station. The amount of drug per tablet and percent of declared is calculated and printed out before proceeding to the next entry. Upon completion, the average found per tablet and the average percent of declared is listed.

Minimum Hardware:	8K PDP-8
Source Language:	8K FOCAL 1969

DECUS NO. FOCAL8-221

LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation

Dr. James E. Gano and Dr. H. Bradford Thompson, University of Toledo, Toledo, Ohio

The Stern-Volmer Equation, often utilized by photochemists to treat data, in its most general form (reactive and quenchable triplet and singlet states) is processed by an iterative least squares approach applicable to such nonlinear equations.

Minimum Hardware:	8K PDP-8; To employ plotting option AXØ8 and XY recorder must be included
Storage Requirement:	5114_8
Source Language:	8K FOCAL

DECUS NO. FOCAL8-222

Center of Gravity Calculations

Joel D. Scheraga, Stamford High School, Stamford, Connecticut

This program, written especially for students of Model Rocketry, enables the user to determine the center of gravity of the rocket and the weight of the rocket 1. minus the engine; 2. including the engine; 3. at the time of burnout.

Minimum Hardware:	4K PDP-8, TTY
Other Programs Needed:	DECUS NO. FOCAL8-52a
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-223

FOCLX, 1972

Bob Cronin, Belmont Hill School, Belmont, Massachusetts

This is a 4-user, expanded version of FOCAL 1969, similar to FOCAL, AMITY (DECUS NO. FOCAL8-136). Added features are change core function and examine core function.

DECUS NO. FOCAL8-223 (Continued)

Suggestions for application of these functions are included in the write-up.

Minimum Hardware:	8K PDP-8, 1-4 ASR33 with associated interfaces
Restrictions:	No high speed reader routine
Miscellaneous:	Tape is punched in XCBL format (See DECUS NO. 8-26D)
Source Language:	PAL III

DECUS NO. FOCAL8-224

SPASTIC - A System for Programming Angles, Scaler and Timer, by Internal Counting

C. Richard Desper, Army Materials and Mechanics Research Center, Watertown, Massachusetts

The FOCAL interpreter has been modified to control a simple PDP-8/L interface for X-ray diffraction experiments. Control operations are accessed through a set of FOCAL functions which control four stepping motors, an internal data break scaler, a timer based on crystal clock interrupt, and the X-ray shutter solenoid.

Minimum Hardware:	4K PDP-8, ASR33, Special X-ray interface DECSPEC 08 0239 D (300Hz clock, data break scaler, solenoid driver, 4 stepping motor drivers
Other Programs Needed:	FOCAL 1969
Restrictions:	Not for PDP-8/S
Source Language:	PAL III

DECUS NO. FOCAL8-225

Loan Amortization Schedule

Adrian Demayo, Department of the Environment, Ottawa, Ontario, Canada

Three computer programs to calculate a loan (mortgage) amortization schedule under various circumstances.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL '69

DECUS NO. FOCAL8-226

Frequency Transformation Program

Klaus Lickteig, Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

Various Fourier transformation methods can be applied when using the Frequency Transformation Program. The following methods are applied:

1. Different integration methods: Simpson and trapezoidal integration; 2. Using a lag window: "hanning" and "hamming;" and 3. Fast Fourier Transformation.

By means of an example, a Critical Comparison of the methods is made.

Minimum Hardware:	8K PDP-8/I or 8/E, ASR33, HSR (optional)
Other Programs Needed:	FOCAL 1969 (DEC-08-AJAE-PB); 8K Overlay (DEC-08-AJ1E-PB); MODV-Choice (FOCAL8-135)
Source Language:	FOCAL 1969, PAL III

DECUS NO. FOCAL8-227a

FOCL/F - An Extended Version of 8K FOCAL/69

D. E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

FOCL/F is a version of FOCAL language which implements several extensions for increased power and versatility. Among these are: user defined functions, user defined interrupt service, execution of machine language instructions from FOCAL, arrayed variables, PS/8 compatibility, line number computation, extended commands, ASCII character commands, links for ease of addition of user assembly-code subroutines, new TTY-high speed reader control commands, A PS/8 overlay is available for file handling from FOCAL, which permits device independent program calling/saving, variable files, and ASCII files. FOCL/F version 12/1/72 is closely compatible with FOCAL-10, the newly released implementation of FOCL/F on the DECsystem-10 by Rob Warnock III at the chemistry department of Emory University. This document includes additions to the earlier version dated 6/1/72.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	PS/8 or OS/8 for PS/8 overlay
Source Language:	PAL

DECUS NO. FOCAL8-228

Great Circle Distance Between 2 Points

A. Moses, Computer Applications Engineering Company, El Paso, Texas

Given the degrees and minutes of latitude and longitude of any 2 points on the surface of the earth, this program calculates the angle at the center of the earth between the 2 points and the great circle distance. Uses a spherical earth with 3960 mile radius.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL

DECUS NO. FOCAL8-229

H-800 Wiring Diagrams

Thomas J. Ford, White Mountains Regional High School, Whitefield, New Hampshire

A DEC H-800-W connector is diagrammed and wire lists, pin diagrams and change orders randomly prepared for it. A second program handles real cases for one connector.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions:	Will cause trouble if used with other versions of FOCAL
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-230

CALCOMP Plotter FNEW PLOTX

P. R. Bell and M. G. Roberts, Digital Equipment Corporation, Albuquerque, New Mexico

This FNEW function uses a modified PLOTX to draw lines and reset the current position to any coordinate rather than just the origin.

Minimum Hardware: 4K PDP-8 with CALCOMP plotter
Other Programs Needed: FOCAL - 69
Source Language: PAL-8

DECUS NO. FOCAL8-231

Extended Precision Sine and Cosine for 4-word FOCAL

Dr. H. B. Thompson, University of Toledo, Toledo, Ohio

This patch provides sine and cosine routines commensurate with the extended precision of 4-word FOCAL. Absolute error for arguments less than 2 pi is less than $3X10^{-10}$. The routine occupies slightly less memory than the original.

Other Programs Needed: 4-word version FOCAL-69
Storage Requirement: Overlay on original FOCAL 69: LOC 5200-5344
Source Language: PAL III

DECUS NO. FOCAL8-232

Roots by Inverse Interpolation

H. Bradford Thompson, University of Toledo, Toledo, Ohio

This subprogram uses a modified inverse interpolation (regula falsi) method to find roots of any continuous function. The user may write a master program, plus subprograms to calculate the function and to store, print, or employ roots, to fit his individual needs.

Other Programs Needed: FOCAL (any version)
Source Language: FOCAL

DECUS NO. FOCAL8-233

A FOCAL-Correlation Program for the LAB-8 System
1. Auto- and Cross-Correlation Program
2. Auto-Correlation Program

Klaus Lickteig, Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

If there are analog measurement signals of low frequencies, a correlation analysis can be made with a FOCAL program. 1) Program 1: An auto- and cross-correlation operated simultaneously. 2) An auto-correlation program with output of data on the teletype should be an example of the possibility of developing out of the above program.

Minimum Hardware: 4K PDP-8/I or PDP-8/E with AXØ8, A/D converter, ASR33
Other Programs Needed: FOCAL 1969 (DEC-08-AJAE-PB)
Source Language: FOCAL, PAL III

DECUS NO. FOCAL8-234

Action Indicator Calculator

Roger Geffen, Data Research Associates, Wayland, Massachusetts

A parameter dependent on price and volume is calculated for a succession of days or weeks, and a cumulative total of this parameter is printed out along with the current value and a line number, which may be the day of the month. Some ability to recover from errors, and the ability to terminate the program at will are incorporated.

Minimum Hardware: PDP-8E, 8K
Other Programs Needed: FOCAL 1969 (DEC-08-AJAE-PB); DECUS NO. FOCAL8-153
Source Language: FOCAL 1969

DECUS NO. FOCAL8-235

MPS Radiation Pattern Program

John G. Morey, Marvelwood School, Cornwall, Connecticut

The program will tabulate the radiation pattern shape (in millivolts per meter at one mile) of any vertical element directional antenna array. Extent of tabulation, number of towers and operating values of each tower (based with reference to one common point) are determined by user input.

Minimum Hardware: 4K PDP-8, ASR33, low speed reader
Restrictions: Sine and cosine functions necessary. Handles maximum of 10 towers
Source Language: FOCAL 1969

DECUS NO. FOCAL8-236

Polynomial Curve Fitting (Streamlined Programs)

Dr. J. H. Battocletti, Medical College of Wisconsin, Milwaukee, Wisconsin

Near-ultimate streamlined programs to allow the greatest number of data points and the largest order as possible, are presented. Two are for the normal polynomial; one forces the fit to go through zero. The third uses the Chebyshev polynomial. Point-by-point error and total RMS error are calculated.

Minimum Hardware: 4K PDP-8 with teletype
Source Language: FOCAL 1969

DECUS NO. FOCAL8-237

Bond Computations

Robert Zuch, White Plains High School, White Plains, New York

The Bond Computations program provides for the valuation of

DECUS NO. FOCAL8-237 (Continued)

coupon bonds. Given the settlement date, maturity date, par value, coupon rate, and either the yield rate or dollar price of the bond, the program will find the yield rate or dollar price, the principal, accrued interest, and the final money. The program will evaluate bonds called before maturity, and will provide for a commission on the dollar price of the bond.

Minimum Hardware: 4K PDP-8, TTY, Tape Reader
Other Programs Needed: FOCAL 4-word overlay
Source Language: FOCAL 1969

DECUS NO. FOCAL8-238

Millikan Oil Drop Experiment

Advanced Topics Class WMRHS
Submitted by: D. Baird, W. McGee, L. Pierce, White Mountains Regional High School, Whitefield New Hampshire

FOCAL simulation of the classical Millikan experiment based on the BASIC simulation "CHARGE" produced by D. Scarl, A. Caggiano, and programmed by C. Lasik for the Huntington Two project.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-239

DIV - Program for Division

Helmut Doepner, Institut fur Physikalische Chemie, Kiel, Germany

Computes and types the repeating decimals that appear in a fraction. Many of the limitations that appear in the program on pages 11-57 and 11-58 of the Programming Languages Manual, 1970, which is useful only for fraction < 1, have been removed.

Minimum Hardware: 8K PDP-8
Source Language: 8K FOCAL 1969

DECUS NO. FOCAL8-240

Science Fiction Quiz

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This is a short, multiply choice literary quiz designed expressly for science-fiction readers.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-241

Satellite Orbital Parameters

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

A short program to determine the parameters of orbiting satellites. Inputs of the radius of the planet and the acceleration of gravity at the planet's surface result in information concerning the orbital velocity and period for any stated altitude above 90 miles.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-242

Solution of Linear Equation Systems with Symmetrically Matrix

K. Wagner, Technische Universitat Berlin, Berlin, Germany

The program gives the solution-vector, an approximate error-vector and the condition number of a linear equation system with symmetrically matrix.

Minimum Hardware: 8K PDP-8E
Other Programs Needed: 8K overlay
Source Language: FOCAL

DECUS NO. FOCAL8-243

Analysis of Variance for One-Two- and Three-Treatment Designs for a PDP-8

Robert Breaux, Texas Tech University, Lubbock, Texas

These programs provide a quick and easy analysis of variance. Modification of error terms to fit particular needs in biology, agriculture, medicine, etc., can be done easily. Output includes terms for pooling error terms, mean comparisons and trend analysis.

Minimum Hardware: 8K PDP-8
Source Language: FOCAL

DECUS NO. FOCAL8-244

HANGMAN IV

Andrew Layman, Stamford High School, Stamford, Connecticut

This program will allow user to play Hangman with only 4K. It is virtually idiot-proof and simulates non-computer game in playing style almost perfectly.

Minimum Hardware: 4K PDP-8, ASR33
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Restrictions: Delete Functions
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-245

Executive and Utility Routines for FOCLX, 1972

Robert Cronin, Belmont Hill School, Belmont, Massachusetts

These routines contain a header change for Quad FOCLX which will change the normal header message to any 12 character string typed by the user; a program to unpack and print a Quad FOCLX user buffer; a binary punch routine, and a tape label program.

Minimum Hardware:	8K PDP-8/I with 4 ASR33's and associated PT08's
Other Programs Needed:	FOCLX System (DECUS NO. FOCAL8-223)
Source Language:	FOCLX, 1972 (DECUS NO. FOCAL8-223)

DECUS NO. FOCAL8-246

Undefeatable FOCAL TIC-TAC-TOE

Henry K. Portner
Submitted by: Robert Cronin, Belmont Hill School, Belmont, Massachusetts

An undefeatable TIC-TAC-TOE program based upon a "Magic Square Algorithm."

Minimum Hardware:	4K PDP-8 series with console keyboard
Other Programs Needed:	Any FOCAL dialect
Source Language:	FOCAL '69

DECUS NO. FOCAL8-247

FNEWS Overlay to Use Hogh Speed Punch with FOCAL Program

Alessandro Zanon, Istituto Nazionale di Fisica Nucleare, Legnaro (Padova), Italy

This overlay adds three new functions to FOCAL-1969 and modifies the scope routine. One of these functions may be used to write a very short routine enabling the high speed punch

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL-1969 (DEC-08-AJAE-PB)
Source Language:	PAL-D

DECUS NO. FOCAL8-248

FOCTXT - Text Input-Output Patch to FOCAL-1969

F. R. Johnson, Dow Badische Company, Freeport, Texas

FOCAL was developed to be used as a problem solving language. As such, input to a user program is restricted to numeric entries. This patch allows two new functions, FRSC(X) (Read String of Characters) and FTSC(X) (Type String of Characters). These functions allow the user of FOCAL to input and output text that is not included in the body of the user program.

Minimum Hardware:	Any configuration which supports FOCAL
Other Programs Needed:	FOCAL-1969
Storage Requirement:	One page
Miscellaneous:	This program was developed on a PDP-5
Source Language:	PAL III

DECUS NO. FOCAL8-249

Payroll Listings and Totals

John A. Villano, CAM-A-TON, Waterbury, Connecticut

This routine uses all 72 characters of the teletype to print payroll information for each employee on one line and also outputs totals at the end of the payroll. A data tape, with leader-trailer between employees, prepunched with the initial ASK information of name, marital status, number of dependents and a one or zero depending upon whether an insurance payment is to be deducted, allows the operator to merely enter the number of hours worked. The routine will handle specified amounts of withholding and will skip FICA when the limit is reached.

Minimum Hardware:	4K PDP-8
Restrictions:	Employees' names limited to 7 characters and must not end in "E". Deleting insurance deduction column would permit 11 characters
Miscellaneous:	Object computer - PDP-8/F
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-250

Six Curves - GMS037

Joseph P. DiBella, General Management Systems, Miami Springs, Florida

Used to calculate six regression equations for a set of bivariate data. Regression coefficients and the index of determination are computed for a linear equation and five common non-linear equations. The six curve types used are:

1. Y=A+B*X
2. Y=A*B↑X
3. Y=A*X↑B
4. Y=A+B/X
5. Y=1/(A+B*X)
6. Y=X/(B+A*X)

There is no input limit for the total number of observations.

Minimum Hardware:	4K PDP-8/E, ASR33
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-251

"WORD" - Character Generation Using FOCAL's FDIS Function

Willard L. Craft and Michael H. Jacobitz, Adrian College, Adrian, Michigan

"WORD" is intended as a demonstration of a modification to

DECUS NO. FOCAL8-251 (Continued)

FOCAL's FDIS function. The game is similar to "Hangman," with both the computer and the operator thinking of a word and then trying to guess the other's word, letter by letter. A patch to extend the program's vocabulary is included. Information concerning the modification is also included.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL 1969

DECUS NO. FOCAL8-252

12.K Overlay for FOCAL

Andrew F. Bauer, Standard Telephone & Cables Ltd., Basildon, Essex, England

This program overlays 4 word 8K FOCAL to give FOCAL the use of 661 variables stored in Field 2 (excluding the last page). No special functions or definitions are necessary - the overlay in no way affects the normal operation of FOCAL.

It should be particularly useful to PS/8 users with TD8E DECtape who require a minimum of 12K to make better use of the core available.

Minimum Hardware: 12K PDP-8
Other Programs Needed: FOCAL '69 (DEC-08-AJAE-PB), INIT, 4-word, 8K Overlays
Source Language: PAL

DECUS NO. FOCAL8-253

Solution to Any Equation Involving One Variable

Peter Cornish, Trinity Grammar School, Kew, Melbourne, Victoria, Australia

This program solves the equation F(X)=0 through Newton's method of iteration. The computer asks for F(X), F'(X), and an approximation to X. The computer then works out a better solution, accurate to 6 or 10 significant figures, depending on the sort of FOCAL being used. When there is more than one value for X, the value closest to the approximation will be found out.

This program can be used with FOCAL's extended functions IN.

Minimum Hardware: PDP-8 with TTY
Restrictions: User must be able to differentiate F(X)
Source Language: FOCAL 1969

DECUS NO. FOCAL8-254

Patch to Allow Computed Line Numbers in FOCAL, 1969

Eben F. Ostby, RR#1, Box 10, Hampton, Connecticut

This patch loads over the routine XGETLN in FOCAL, modifies that routine to allow for computed line numbers, returns the correct value for LINENO with evaluatable arguments. In addition it still allows the use of the argument ALL.

Minimum Hardware: PDP-8
Restrictions: Disables ADC function; not usable with 8K and 4 word overlays. Argument for evaluatable line numbers must not start with letter "A"
Source Language: PAL

DECUS NO. FOCAL8-255

Repeating Decimal

Glen Larson
Submitted by: Kevin Willoughby, Attleboro High School, Attleboro, Massachusetts

A short, simple program to type the decimal equivalent of two numbers as a repeating decimal. This routine is fancier than the one in DECUS NO. FOCAL8-33, as it can handle fractions greater than one, and the output is self-terminating.

Minimum Hardware: PDP-8
Other Programs Needed: FOCAL, 1969
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-256

OPTION $

Horace D. Stephens, Waynflete School, Portland, Maine

This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) enables two OPTIONs, OPTION $ and OPTION F. OPTION $ makes F a legal variable identifier and makes $ the function label. (FSQT(4) becomes $SQT(4).) OPTION F restores F as the function label and makes F an illegal variable identifier. The patch will work with FOCAL 5/69 with or without the extended functions and with or without DECUS NO. FOCAL8-189. Two of FOCAL's OPTIONs must be replaced with this patch. Information is included to permit the user to select which OPTIONs to trade.

Minimum Hardware: 4K PDP-8
Restrictions: Replaces two of FOCAL's OPTIONs
Source Language: Machine Language

DECUS NO. FOCAL8-257

LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM

William Murray, 4164 Shady Valley Drive, Arlington, Texas
Submitted by: Sally Richards, Digital Equipment Corporation, Maynard, Massachusetts

Three short routines demonstrating the random generation function of FOCAL 5/69 (DECUS NO. FOCAL8-52a).

Minimum Hardware: PDP-8
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-258

Hearing Loss Simulator

Thomas H. Townsend, Area of Communication Disorders, Dept. of Speech, Central Michigan University, Mt. Pleasant, Michigan

The "Hearing Loss Simulator" program enables the Audiology student to follow clinical testing procedures to obtain thresholds on a hearing loss simulated by the computer. The student has all the options which are available on the clinic audiometer. These include the choice of six (6) frequencies, the ear to be tested, the pure-tone presentation mode, the masking level in the non-test ear, and the hearing threshold level of the pure-tone.

Minimum Hardware: 4K PDP-8/L and ASR33
Other Programs Needed: FOCAL, 1969
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-259

High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69

Jonathan Grobe, State University of New York at Stony Brook, Stony Brook, New York

Three modifications have been made to FOCAL 69. Punch is the new Type command for the high speed punch (Type operates low speed punch only; Punch operates high speed punch only). CRTL/W sets up the high speed punch for the Write command. FRAN is replaced by an improved random number generator, FRAN8 (DECUS NO. FOCAL8-150), but modified so it will also work with MODV (DECUS NO. FOCAL8-135). No user storage areas are affected, since these overlays occupy locations formerly used by FRAN, the Library command, and the Interrupt Processor.

Minimum Hardware: PDP-8, High Speed Punch, ASR33
Other Programs Needed: FOCAL, 1969 (DEC-08-AJAE)
Restrictions: Library command and Interrupt Facility are unavailable; CTRL/C doesn't work
Source Language: PAL III

DECUS NO. FOCAL8-260

Arithmetic and Geometric Progressions

J. Pressley, 33 Belvedere Avenue, Glen Waverly, Victoria 3150, Australia

This program will find any number in an arithmetic or geometric progression and will add the first n terms of that progression.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-261

Chi Square Utility Package, CHISQR

H. A. Taylor, Rutgers University, New Brunswick, New Jersey

Computes X^2 for a) 1xL frequency table, testing uniformity of frequencies; b) KxL frequency table, as a test of independence; c) 2x2 correlated contingency table, as a test for the significance of change or other related responses from the same individuals. For any 2x2 table, automatically applies Yates' correction for continuity if any expected value lies between 5 and 10; for a 2x2 test of independence, automatically applies Fisher's exact probabilities method if any expected value is less than 5.

Minimum Hardware: 4K PDP-8, TTY
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-262

Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug

R. F. Mais, R. D. McCook, Y. T. Oester, Research Service, Hines V. A. Hospital, Hines, Illinois

The two programs "Fraction Bound" and "Total Drug" provide for the calculation of fraction drug bound or /total drug concentration for a given total drug concentration or / fraction drug bound calculated from the usual protein binding constants of number of sites N(1) and N(2) and the corresponding association constants K(1) and K(2) and the protein concentration P. The programs are written in FOCAL for the PDP-Lab 8E with 4K core. The output is fraction bound (FB) or total drug (CO), free drug concentration (C), bound drug to protein ratio (R), R to free drug ratio (R/C), and fraction of protein sites occupied (FP).

Source Language: FOCAL 1969

DECUS NO. FOCAL8-263

ROOTS, A Polynomial Root Finder

Gregory Ruth, M.I.T. Charles Stark Draper Laboratory, Cambridge, Massachusetts

ROOTS solves second, third and fourth order polynomial equations whose coefficients are real. It finds all real and complex roots. It calculates the roots directly, from closed form solutions, so the results (which are exact solutions, not approximations) are obtained virtually instantaneously.

Minimum Hardware: PDP-8
Source Language: PS/8 FOCAL 1971

DECUS NO. FOCAL8-264

MEMORY, A Children's Game

Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

MEMORY is a children's game with paired cards, programmed for the KV8 display system in FOCAL. It relies on the player's capability to remember which cards lie on a table and where. The game is played with the cursor and interrupt-bar, and displayed on the KV8 display system.

Minimum Hardware:	8K PDP-8, KV8 display system with VT01 storage display and Joystick-interrupt-bar
Other Programs Needed:	8K FOCAL and 8K FOCAL Display for KV8 (DECUS NO. FOCAL8-154)
Source Language:	PAL-8, PAL-D

DECUS NO. FOCAL8-265

LISTAL

Lawrence Moss, University of Vermont, College of Medicine, Burlington, Vermont

LISTAL is a PS/8 FOCAL utility program that will dramatically determine the FOCAL programs on a given device and then individually lists each program on the teletype (or lineprinter if available). No operator interview is required and listing proceeds until all .FC files have been listed.

Minimum Hardware:	8K PDP-8, PDP-12 or LINC-8
Other Programs Needed:	PS/8 or OS/8, PS/8 FOCAL 1971 (DECUS NO. FOCAL8-177)
Source Language:	PS/8 FOCAL, 1971

DECUS NO. FOCAL8-266

STATPACK, An Interactive Statistical Package

Lars Palmer, A B Hassle, Molndal 1, Sweden

STATPACK is a statistical package written in FOCAL with a main aim being to give an interactive program with a high degree of convenience for the user. A large number of different statistical analysis are included in the program and can be reached from the keyboard with the material in core. The material has only to be entered once and is kept in core or written into a data file as requested by the user. The programs also contain accessory routines for calculating percentages and other functions of the input material and for changing, correcting and listing the material.

Minimum Hardware:	OS/8 System
Other Programs Needed:	PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language:	FOCAL

DECUS NO. FOCAL8-267

BLACKJACK for FOCAL, 1969

Jeffrey Scott, 8604 Bunnell Drive, Potomac, Maryland

This program plays Blackjack with a user. The computer acts as dealer and computes all winnings and losses. After a full deck of 52 different cards is dealt by the dealer, the teletype bell rings to show that a new deck has been started. The computer usually wins, but it is not a perfect player.

Minimum Hardware:	PDP-8
Other Programs Needed:	FOCAL, 1969 (DEC-08-AJAE-PB)
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-268

FX Function for Random Access Files

Lawrence Moss, Cardiopulmonary Lab., University of Vermont, Burlington, Vermont

The function FX is a random access data function for use with PS/8 FOCAL. It allows the user to build and handle data files in a random fashion, rather than in the sequential pattern which is standard with PS/8 FOCAL.The maximum array size is 2047 floating point variables, of either six or ten digit precision.

Minimum Hardware:	8K PDP-8 or PDP-12 with mass storage device
Other Programs Needed:	PS/8-12 or OS/8-12, OMSI PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language:	PAL-8

DECUS NO. FOCAL8-269

4K FOCAL '69 Speed-Up Patches

Jim Crapuchettes, Frelan Associates, Menlo Park, California

These changes are to a number of the internal routines for FOCAL '69, but they could be adapted to FOCAL8. In most cases, no changes to the functions of the routines have been made. These patches were developed after an extensive program of timing the execution of FOCAL.

Minimum Hardware:	4K PDP-8 (Source file is on OS/8 DECtape)
Other Programs Needed:	FOCAL '69
Source Language:	PAL-8

DECUS NO. FOCAL8-270

MONOPOLY

C. C. Wilton-Davies, R. N. Physiological Laboratory, Alverstoke, Hants, United Kingdom

The computer acts as "Banker" in the English version of the well-known board game. Storage limitations are overcome by

DECUS NO. FOCAL8-270 (Continued)

using eight of the programs as subroutines of the ninth, master program. Up to eight players are allowed, who may buy and sell properties with each other as well as from the bank, raise and settle mortgages, and buy houses to raise the rents on their properties. "Chance," "Community Chest" and dice throws are determined by random numbers, and jail awaits those who throw three doubles in a turn, or who are otherwise sent there.

Minimum Hardware: 8K OS/8 System
Other Programs Needed: PS/8 FOCAL (DECUS NO. FOCAL8-177)
Source Language: PS/8 FOCAL

DECUS NO. FOCAL8-271

Modification of FOCL/F for Data Acquisition and Control

Douglas E. Wrege, Georgia Institute of Technology, Nuclear Research Center, Atlanta, Georgia

It is the aim of this paper to help the user to code specific routines in FOCAL™ so that his dialect of FOCAL can be applied to his application (without being forced to understand in detail all the workings of FOCAL). Included are descriptive discussions of how FOCAL works, the philosophy of the language, and sections technically oriented toward helping the user actually code his additions. This paper is an extention of DECUS NO. FOCAL8-17 and includes most of the discussions contained therein. The particular versions of FOCAL described will be FOCAL/69 and FOCL/F, the latter being a version of 8K FOCAL/69 with modifications by the author allowing assembler patches to be more easily added. (DECUS NO. FOCAL8-227a.)

Miscellaneous: Documentation only

DECUS NO. FOCAL8-272

Punched Paper Tape Generator With Randomization Using FOCAL (1969)

Derek Wakelin, Department of Psychology, King's College, Old Aberdeen, Scotland

A FOCAL version of a program containing a random rectangular distribution generator for the production of punched paper tapes for controlling experiments.

Minimum Hardware: 4K PDP-8/I, TTY
Other Programs Needed: FOCAL - 1969
Source Language: FOCAL - 1969

DECUS NO. FOCAL8-273

The Phi Phenomenon

Dr. Thomas Biddle Perera, Barnard College, Columbia University, New York, New York

This program allows the display of the Phi Phenomenon; producing apparent motion from two stationary stimulus dots. It is a simple, easily modified display program using FOCAL on a PDP-8/e equipped with 4K memory, a VC8/E display controller, and a display oscilloscope. The program provides for easy modification of time, direction, and distance parameters to study their contributions to the effect.

Source Language: FOCAL, 1969

DECUS NO. FOCAL8-274

FOCAL 5/69 Input Buffer Patch

Vincent E. Perriello, CAM-A-TON, Waterbury, Connecticut

Patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) to enable data-tape read-in without causing input buffer overflow. The patch is compatible with the 8K (DECUS NO. FOCAL8-189) modification, and like the 8K patch, is patterned on a similar modification in FOCAL 1969.

Minimum Hardware: PDP-8/E, 8/F, 8/M with TTY
Other Programs Needed: FOCAL 5/69 (DECUS NO. FOCAL8-52a)
Source Language: PAL III

DECUS NO. FOCAL8-275

Teletype Histogram and Statistical Analysis of Data Set Extended and Corrected by Teletype

Pat Walsh and Art Miller, University of Illinois Medical Center, Chicago, Illinois

Small number samples (L400) are entered by teletype with resulting teletype listing of mean, standard deviation, variance standard error and total number with histogram display. Error removal sequence allows modification of incorrectly entered input.

Minimum Hardware: LAB-8/L, TTY
Other Programs Needed: FOCAL-8
Source Language: FOCAL '69

DECUS NO. FOCAL8-276

The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data

Pat Walsh and Art Miller, University of Illinois Medical Center, Chicago, Illinois

The purpose of this program is to apply a statistical measure, the Kolmogorov-Smirnov non-parametric test, to samples or data greater than 40 in number, and to suggest whether the two samples are from the same population.

Minimum Hardware: LAB-8, TTY
Other Programs Needed: FOCAL '69
Source Language: FOCAL '69

DECUS NO. FOCAL8-277

Newton Binomial

Kevin C. Willoughby, Attleboro High School, Attleboro, Massachusetts

This program expands the Newton binomial ($(A+B)^N$). Although the basic routine is fairly simple, the output is rather elaborate.

Instructions for use with various versions of FOCAL are included.

Other Programs Needed: FOCAL
Source Language: FOCAL

DECUS NO. FOCAL8-278

A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$

Lloyd Woolner, Fisheries Radiobiological Laboratory, Lowestock, Suffolk, England

The program evaluates the values of the parameters A and K in the equation $C = A\ (1-e^{-Kt})$ by an iterative method, which only requires a starting value for A. As well as calculating A and K, it produces the theoretical values for every t_i and carries out a goodness of fit test.

Minimum Hardware: 4K or 8K PDP-8/L
Miscellaneous: Please specify 4K or 8K when ordering
Source Language: FOCAL '69

DECUS NO. FOCAL8-279

MUSECL MUS16

David Salzman, Belmont Hill School, Belmont, Massachusetts

This program generates measures of music in the treble clef, within the range from middle-C to G'. Selection of the notes is restricted to the twelve naturals in this area; and tones are determined from within the structure of one of several chords: C-major, F-major, or G-major. The beats are variations of 1/16, 1/8, 1/4, 1/2 and whole-notes. Each measure consists of a sequence of notes from one of the chords, in the form of one or more beats, totaling the length of the measure $\frac{b}{4}$, such that the user defines b shortly after the program begins.

Source Language: FOCALX, 1972 (DECUS NO. FOCAL8-223)

DECUS NO. FOCAL8-280

Improved Multiply Loop for FOCAL

Jim Van Zee, University of Washington, Seattle, Washington

This 34 word patch provides a 25-35% reduction in FOCAL's multiply time with a PDP-8/E, F, or M computer. Use is made of the MQ register. The patch is 8 words shorter than the original code and works with FOCAL '69 or FOCAL '71 and presumably most other versions as well.

Source Language: PAL-8

DECUS NO. FOCAL8-281

French Language FOCAL, 5/69

Peter J. Andes, St. Anthony's High School, Smithtown, New York

This patch is designed to convert all the commands, functions, and options of FOCAL, 5/69 (DECUS NO. FOCAL8-52a) into the French language. The patch is in two parts, English to French and French to English.

Minimum Hardware: 4K PDP-8/L, TTY
Other Programs Needed: FOCAL, 5/69 (DECUS NO. FOCAL8-52a)
Restrictions: Applicable only to FOCAL 5/69. Extended functions necessary
Source Language: PAL III

DECUS NO. FOCAL8-282

CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars

James R. G. Howard II and Jimmie B. Fletcher, AIL Information Systems, APO New York, New York

This program will produce a conversion chart for Dollars to Deutsch Marks and Deutsch Marks to Dollars. The initial dialog establishes the starting point and the program will then produce a conversion chart of five rates beginning at the specified starting point and ending 0.05 DM higher. The conversions are made in decade increments from $0.10 to $900.00 and from 0.10 DM to 9000.00 DM. The program could easily be modified for other currencies in a manner shown in attachment 1 to the listing. The program is also an excellent example of "FOR LOOPS" in FOCAL and the power of FOCAL in non-scientific applications.

Minimum Hardware: 4K PDP-8/I, ASR33
Other Programs Needed: FOCAL, 1969 (DEC-08-AJAE)
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-283

Improved EAE Routine for FOCAL

James Van Zee, University of Washington, Seattle, Washington

This is a greatly improved EAE patch for FOCAL which was designed for the 10 digit version, but includes a modification for the regular version as well. It makes available a total of 39 words and reduces the actual multiply time by a factor of 13-15 over the software. This is 3.5 times faster than the patch shown in the listing. In addition the results are

DECUS NO. FOCAL8-283 (Continued)

rounded off rather than truncated so the accuracy is improved too. The coding is readily adapted to the standard Floating Point Packages. See also DECUS NO. FOCAL8-284.

Minimum Hardware: 4K, KE8/I, KE8/E or KE12 EAE
Other Programs Needed: FOCAL '69 or FOCAL-8
Source Language: PAL-8

DECUS NO. FOCAL8-284

8/E EAE Routine for FOCAL

James Van Zee, University of Washington, Seattle, Washington

This EAE patch was specifically designed for the KE8/E and uses Mode B instructions. Both 3 and 4 word versions of the multiply and divide routines are included. The normalize routine has also been rewritten. Total space available is 78 words (10 digit version). Multiply time is reduced by a factor of 18.5 (4.5 times faster than the regular EAE patch) with the results rounded off instead of being truncated. A 1-bit normalization is performed 2-3 times faster. Programmers with KE8-I or KE12 hardward should request DECUS NO. FOCAL8-283.

Minimum Hardware: 4K, KE8/E, EAE
Other Programs Needed: FOCAL '69 or FOCAL-8
Source Language: PAL-8

DECUS NO. FOCAL8-285

Online Graph - With Self Determining Scale Factor

Robert M. Hashway, West Warwick, Rhode Island

Will display on TTY the graph of a function of one variable. If a function is plotted over a 'wide' range and a particular area of the graph is of interest, upon input of new coordinates new scale factors will be calculated and the graph expanded over this domain to fit into a y-axis consisting of 50 spaces.

Extended functions must be retained.

Minimum Hardware: 4K PDP-8/e, ASR33
Other Programs Needed: FOCAL, 1969
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-286

Arithmetic Practice

R. Kenneth Walter, Webb School of California, Claremont, California

This program allows a student user to choose between operations of +, -, x, / integers or decimals and gives him 10 problems of the type he requests. Subsequent sets of problems are progressively easier, similar, or more difficult depending upon the student's percentage score.

Minimum Hardware: 4K PDP-8/L
Source Language: FOCAL, 1969

DECUS NO. FOCAL8-287

CC-FOCAL-Q

Adrian Q. Abraham
Submitted by: A. R. D. Ramsay, Christ's College, Christchurch, New Zealand

CC-FOCAL-Q enables two versions of FOCAL to be stored on DECtape. Either can be called into core from keyboard. FOCAL programs can be saved on DECtape, and called from DECtape.

Minimum Hardware: 4K PDP-8/e with ASR33; Single transport TD8E Dectape
Other Programs Needed: FOCAL, 1969
Restrictions: No provision has been made for any hardware, e.g. HSR, dual DECtape or 8K
Source Language: PAL III

DECUS NO. FOCAL8-288

FSPACE - Space Command for FOCAL '69

Jonathan Grobe, State University of New York at Stony Brook, Stony Brook, New York

A new command has been added to FOCAL 69 to output spaces. Instead of TYPE " " to output 20 spaces, one need only write X 20. A new technique is illustrated to add new commands to FOCAL -- it is not necessary to give up the Library or another command.

Other Programs Needed: FOCAL '69 (DEC-08-AJAE)
Storage Requirement: Locations 4525-4577 or 5325-5377
Source Language: PAL III

DECUS NO. FOCAL8-289

TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible with the TTY Intercom Terminal to CDC6000 Computer Series

Charlotte McFaul and Harold Cohn, Naval Ship Research and Development Center, Annapolis, Maryland

This patch uses the FOCAL command, TYPE !, to punch data on paper tape in a format compatible with the TTY INTERCOM terminals of the CDC6000 computer series.

Minimum Hardware: PDP-8 with low speed punch
Other Programs Needed: 4K FOCAL '69 (DEC-08-AJAE-PB)
Storage Requirement: 4K
Source Language: PAL-D

DECUS NO. FOCAL8-290

Kolmogorov-Smirnov Test for Normality

Ernest M. Stokely, University of Texas, Southwestern Medical School, Dallas, Texas

This program tests the hypothesis that a given sample comes from a parent population having a normal distribution. The test is an alternative to the chi-squared test. 8K FOCAL is desirable because of the large program size. Data ranking, normalization, and comparison with values from the cumulative normal distribution are computed by the program.

Minimum Hardware:	PDP-8/I with ASR33 or equivalent
Other Programs Needed:	8K FOCAL '69
Source Language:	FOCAL '69

DECUS NO. FOCAL8-291

DRANO

Ed Vogel, Canton High School, Canton, Massachusetts

DRANO takes user's FOCAL files, one by one, most recent first, prints a file name and information, then allows user to either delete, save, or list the file. It then proceeds to the next file.

Minimum Hardware:	TSS/8, ASR33
Source Language:	PAL-D

DECUS NO. FOCAL8-292

CHCIG8

Uli Weidmann, Department of Psychology, The University, Leicester, England

CHCIG8 provides text and plotting facilities on a non-storage scope (VC8E and VR14) for the 8K PDP-8/E (LAB8/E). It has fast chaining facilities - using TD8E DECtape - for running large programs, for data handling and for presenting dynamic displays or sequences of pictures. The high-speed punch and reader can be used. CHCIG8 can run under OS/8. The ADC knobs may be used as sense switches; the content of field 1 core locations can be displayed on the CRT.

Peripherals Required:	VC8-E, VR14, TTY
Storage Requirement:	8K (+ROM if OS/8 is used)
Restrictions:	No extended functions
Miscellaneous:	ASCII tapes offered are not Source tapes for CHCIG8. They are demo programs
Source Language:	FOCAL8, FOCAL '69, PAL-8

DECUS NO. FOCAL8-293

A Laboratory and Real Time Patch With FNEW FOCAL 5/69

G. Schayes and L. Zandarin, Institut d'Astronomie et de Geophysique, Louvain-la-Neuve, Belgium

Allows laboratory experiments to be connected in real time to the computer in FOCAL language. There are three main parts:

1) A FOCAL function FNEW is created having two independent features: a) it allows PDP-8/E core memories to be read (or to be written in) in FOCAL language; b) it allows to read in or to output pulses on the DR8/EA 12 channel buffered digital I/O.

2) Pulses coming on this DR8/EA interface are creating a dynamic interrupt of the inner program by executing the FOCAL group 15 instructions (equivalent to a "DO 15").

3) The KP8E Power Fail Detect option is used to save active registers as AC, LINK and PC when a power low condition is detected in order to restart the program at the interrupt point when power is restored.

This subroutine is to be used with FOCAL TAFT 5/69 (DECUS FOCAL8-52a) and the 8K overlay for FOCAL TAFT (DECUS FOCAL8-189).

Source Language:	PAL III

DECUS NO. FOCAL8-294

Real Time FOCAL on the PDP-8 Computer

Paul T. Brady and Judy Popelas, Bell Laboratories, Holmdel, New Jersey

Real Time FOCAL (RTF) is an adaptation of FOCAL MOD-V to allow input/output statements to be executed in the FOCAL language with millisecond timing accuracy. That is, the times at which inputs occur can be determined to within one msec, and outputs can be controlled to one msec accuracy. Also included in RTF are: (1) a statistical random number generator, (2) a computed GOTO statement, and (3) a logical AND function. RTF requires a PDP-8 with 8K memory and a real time clock and can be adapted to drive a variety of 12-bit input/output devices such as the BDIO on the PDP-8/E.

Two versions of RTF are available. The principal difference between them is that the first uses a clock and two BDIO devices that operate off of the PDP-8/E Omnibus, as well as some "standard" I/O bus devices, while the second version, written for the 8/L, performs I/O exclusively with standard I/O bus modules.

Minimum Hardware:	8K PDP-8, Photoreader, Clock, general purpose 12-bit I/O registers
Restrictions:	Minor modifications would be required to tailor in/out instructions to user's devices.
Source Language:	Machine Language

July 1974

DECUS NO. FOCAL8-295

ATTND - Monthly Attendance Reporting Module

Robert M. Hashway, 1794 New London Turnpike, Apt. 52, West Warwick, Rhode Island

This program will calculate the information required for most schools in their home room teachers' monthly reports. Also, data is accumulated for the school state report. The information may be batched. The ASR teleprinter is used for input and output. This program can be operated on a PDP-8/E mainframe with 4K of 8 bit words, under FOCAL, 1969 with extended functions retained. Thus, most mathematics or science departments could process the reporting for their respective schools with a minimum of manpower.

Source Language: FOCAL '69

DECUS NO. FOCAL8-296

FOCALINUS - Molecular Geometry Calculator

H. Bradford Thompson, Department of Chemistry, The University of Toledo, Toledo, Ohio

FOCALINUS performs a variety of calculations based on description of the geometry of molecules in terms of internal coordinates: bond and dihedral angles and bond lengths. In addition cartesian coordinates of all the atoms, a variety of interatomic distances and angles may be derived, including three types of dihedral angles. FOCALINUS is a FOCAL derivative of the program LINUS, described in the Journal of Chemical Physics, 47, 3410 (1968).

Minimum Hardware: 8K PDP-8/I or 8/E
Restrictions: At most 33 atoms can be handled
Source Language: FOCAL 69 with FCOM Function

DECUS NO. FOCAL8-297

LUNGS - A System of Programs for the Calculation of Selected Cardiorespiratory Parameters

Robert R. Demers A.R.I.T., Anesthesia Research Laboratory, Rhode Island Hospital, Providence, Rhode Island

The system of programs designated "LUNGS" performs calculations to aid in the diagnosis and therapy of pulmonary disorders. Among the functions performed by the programs are: correction of blood gas data from in vitro to in vivo conditions, calculations of tidal volume, respiratory rate, minute ventilation, deadspace volume, minute alveolar ventilation, oxygen uptake, respiratory exchange ratio, alveolar-arterial oxygen difference, arteriovenous oxygen difference, Fick cardiac output, cardiac index and percentage shunt. It can be applied to patients breathing spontaneously or being mechanically ventilated. One of the system programs corrects blood gas data obtained during hypothermia and extracorporeal circulation.

Minimum Hardware: PDP-8/I; ASR33
Other Programs Needed: FOCAL 1969; 8K Utility Overlay
Storage Requirement: 8K
Source Language: FOCAL

DECUS NO. FOCAL8-298

Critical Points of a P(x) of Degree N (Real Coefficients)

Michael Lonergan
Submitted by: Brother John O'Connell, C.F.X., St. John's Prep School, Danvers, Massachusetts

This program will, in most cases, output the coordinates of all maximum, minimum and points of inflection of a P(x) of degree N. The polynomial must have real coefficients. N must be a positive integer.

Minimum Hardware: PDP-8/S
Storage Requirement: 4K (without extended functions)
Restrictions: If the second derivative (P_2) =0, the method fails
Source Language: FOCAL '69

DECUS NO. FOCAL8-299

FOPAY - Weekly Payroll Deductions and Computations

Michael H. Jacobitz, Cougar and Hunter, Inc., Flushing, Michigan

The program provides a practical weekly payroll computation for any number of employees, on either an hourly or a salaried basis. In addition to computing and deducting both federal and state income taxes, the program also computes the F.I.C.A. tax and provides for two additional deductions such as union dues, group insurance or a retirement fund. Upon completion of the program, running totals of deductions and weekly wages are printed, along with a total of the employer's weekly payroll liability.

Storage Requirement: 4K (with extended functions removed)
Source Language: FOCAL '69

CHANGES AND ADDITIONS TO DECUS PDP-8, FOCAL8 CATALOG OF JULY 1973

UPDATE NO. 1

DECUS

December 1973

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UPDATE NO. 2

PDP-8, FOCAL8 CATALOG OF JULY 1973

The enclosed pages contain changes to information contained in the above mentioned catalog and Update No. 1 dated December 1973 and additions to the FOCAL8 section. Please replace existing pages with the correspondingly numbered pages in this issue and add the new pages.

Category Index pages have been revised to include only those programs contained in the first volume of programs (July 1973, Update No. 1 and this Update). Please remove existing Category Index pages and replace them with those attached.

Category Index of programs contained in Volume II can be found in that volume.

If you have any questions concerning these catalogs, please contact us.

DECUS PROGRAM LIBRARY CATALOG

FOR

PDP-8, FOCAL8, BASIC8

VOLUME II

DECEMBER 1973

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UPDATE TO VOLUME II

OF

PDP-8, FOCAL8, BASIC8, PDP-12 CATALOG

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Updated and Changed - November 1975

This Update - June 1976

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EDITOR'S NOTE

Because it is not always possible to include all pertinent information in the brief abstract, we recommend that users first order only write-ups when there is some doubt as to whether or not a specific program will fit the user's needs.

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June 1976

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I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
8-604	'GET' Command for Disk/DECtape Monitor System
8-608	FUTIL - OS/8 File Utility
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-632	RWDF32
8-633	MAC8, 8K MACRO ASSEMBLER
8-635	PAL12D
8-641	OS/8 FORMAT
8-644	MINMON - TD8E DECtape Minimonitor
8-646	DECsystem-8
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O
8-655	Patches to CINET-BASIC (DECUS NO. 8-159)
8-658	Extended Double Precision Interpretive Package
8-662	UNDEFSYBLIST - Undefined Symbol List
8-668	RAW - A Reverse Assembler of Windsor
8-676	MOVE DELETE
8-682	SCPSYS (Scope System)
8-691	ACCK Timeshare Accounting System
8-694	Teletype Line Printer Emulator Handler for OS/8
8-699	MPS External Event Common Routines
8-702	COGO-8
8-706	BITSET
8-708	EMLP: Emory Linear Programming Package
8-719	OS/8 Software for a TC58 Magtape Controls
8-721	LISP-8K
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer
8-734	Microprocessor Language Assembler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-747	STAGE2 MACRO Processor
8-749	UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined Functions for OS/8 BASIC
8-751	FORTRAN IV for OS/8 FORTRAN II Users
8-752	MIG8E2 - Monitor of Interruptions Which Are Generated by the PDP-8/E Peripherals
8-757	OS/8 Utility Package
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-768	EDAS - Editing and Assembling System
8-770	MOSS - 4K TD8E DECtape System
8-771	PRGSCH - TSS/8 Program Searcher
8-777	PDP8ASM
8-807	UTILITY ROUTINE, and Patches to the FORTRAN Compiler
8-814	PROCES: An Image Processing Program for the PDP-8/e
8-817	LABCOL: Laboratory Control and Automative Language

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
8-601	OASIS
8-606b	PIP11
8-611a	SLED - Source and Listing Editor
8-623	PAGER
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format
8-640	OS/8 EDIT PLUS
8-651	SOLMT (Sort Overlay Listings Using Magnetic Tape
8-681	CASE - Carleton Symbolic Editor
8-682	SCPSYS (Scope System)
8-731	MEMO IV
8-756	ASCON - ASCII File Converter
8-764	LIST
8-768	EDAS - Editing and Assembling System
8-774	Simple ASCII Editor and Tape Reproducer
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-785	GPATCH
8-786	TSS/8 FORMAT

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

8-601	OASIS
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-624	DUMP and LOAD, TSS/8
8-636	BEST - Binary to Symbolic Traductor
8-639	OS/8 DISASM
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 EDUsystem 50)
8-720	LSTDMP: Binary Tape Dump/Lister
8-727	Disassembler
8-733A	PDP-8/E RJE System (IBM 2780 Emulator)
8-736	Paper Tape Reader-Printer
8-738	The Business Management Laboratory
8-755	OCTYPE - Octal Memory Dump
8-763	KL8TST - KL8/E, KL8/J Diagnostic
8-765	DUMPOS - Dumps OS/8 ASCII Files
8-784	TSS/8 TTRACE and TSS/8 LTRACE
8-806	SACO: Simulation of an Analogue Computer
8-811	DYNOD: Dynamic Octal Debugger

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
8-601	OASIS
8-605	ADUMP8
8-672	XCBL and XBIN Loader
8-683	BNLOAD, TSS/8 Binary Loader
8-684	Injection Patcher - IJPA
8-701	TEXT: Readable Punch Handler for OS/8
8-730	CORVU: A Display and Teletype Input-Output Program
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal
8-776	BNPF Format Paper Tape Loader for MPS
8-803	FOLMAT
8-815	BINPUN: OS/8 Binary Punch From Core Image Files

V. DUPLICATION, VERIFICATION

8-600c	EXPIP (Extensions PIP)
8-606b	PIP11
8-663	REPROD/ Read, Punch and Verify Product
8-722	Mini-Copy
8-775	COPIER
8-791	DELAY
8-803	FOLMAT

VI. NUMBERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

DECUS NO.	TITLE
8-607	CALCU1
8-615	EAE Multiplication for 8K FORTRAN
8-621	Gray Code Conversion Package
8-625	Floating Integer Function for use with 8K FORTRAN
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine
8-658	Extended Double Precision Interpretive Package
8-678	Routine to Expand and Modify the DEC Floating-Point Package
8-685	DPSQRT - Double Precision Square Root for PDP-8
8-691	ACCK Timeshare Accounting System
8-696	DECTYP, One-Word Signed Decimal Print
8-716	Exponential Functions
8-717a	F4EAE - EAE Overlay for FRTS
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC
8-737A	Four Word Floating Point Package for MPS
8-737B	Four Word Floating Point Functions for MPS
8-737C	Rudimentary Calculator for MPS Four Word Floating Point Routines
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV
8-794	IFAC
8-796	FVWDFP: Five Word FPP
8-806	SACO:Simulation of an Analogue Computer

VII. UTILITY

8-600c	EXPIP (Extensions PIP)
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2
8-606b	PIP11
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format
8-634	MOVE
8-649	QPIP - OS/8 Directory Editing Program
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers
8-657C	TR, Binary to ASCII Translator
8-663	REPROD/ Read, Punch and Verify Product
8-667	LABLDP - A TSS/8 Tape Labeling Program
8-671	Restoring Symbolprint
8-675	INDUMP - Input Dump
8-677	STAR PIP
8-684	Injection Patcher - IJPA
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program
8-691	ACCK Timeshare Accounting System
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - EDUsystem 50)
8-698	TEKLIB

DECUS NO.	TITLE
8-701	TEXT: Readable Punch Handler for OS/8
8-714	PDPLST: PDP-8 - IBM 360/370 Cross Listing Program
8-719	OS/8 Software for a TC58 Magtape Control
8-722	Mini-Copy
8-728	MEND
8-730	CORVU: A Display and Teletype Input-Output Program
8-736	Paper Tape Reader-Printer
8-739	COPY.PA
8-742	CLOCK - A Real-Time Clock/Calendar Routine
8-743 a	FILFIX - TSS/8 File Structure Repairing and Restructuring Program
8-753	OS/8 System Output Handlers
8-754	NUMBER and REDATE - OS/8 File Utility Programs
8-757	OS/8 Utility Package
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal
8-764	LIST
8-771	PRGSCH - TSS/8 Program Searcher
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems
8-774	Simple ASCII Editor and Tape Reproducer
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Maatape
8-780	SPLIT and SPLICE
8-789	RKCOPY
8-791	DELAY
8-795	RINROT: A Roll-in, Roll-out Program
8-798	OS/8 to RSTS Interface
8-803	FOLMAT
8-807	Utility Routine, and Patches to the FORTRAN Compiler
8-812	CASINO: Sykes Cassette Input/output
8-815	BINPUN: OS/8 Binary Punch from core Image Files
8-817	Utility Routine, and Patches to the FORTRAN Compiler

VIII. DISPLAY

DECUS NO.	TITLE
8-614	Clock Calibration
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System
8-622	KV8/I - VTØ1 Device Handler
8-637	A Flexible Data Buffer Display Routine for LAB-8 Systems
8-659	VT05
8-674	External - or RC - Clock (AXØ8) Calibration
8-682	SCPSYS (Scope System)
8-695	Real Time Display Processor for a KV8 Graphic System and KW8 Clock
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
8-730	CORVU: A Display and Teletype Input-Output Program
8-746	Device Handler for Tektronix 611 Storage Scope
8-764	LIST
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator
8-772	OS/8 Compatible VC8E Handler for Mass Storage Systems
8-773	Graphics Package for the Tektronix 4010 Under OS/8
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
8-817	LABCOL: Laboratory Control and Automation Language

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

8-608	FUTIL - OS/8 File Utility
8-610	INVENT-8
8-611a	SLED - Source and Listing Editor
8-612	ELAN - Elementary Linguistic Analysis
8-613	Interconversion Between A/D Floating Point and D/A Formats
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O
8-657A	INPUT, A Neurophysiological Data Collecting Program
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers
8-657C	TR, Binary to ASCII Translator
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program
8-706	BITSET
8-711	Microprocessor Cross Reference Program for OS/8
8-723	Function Comp.FT
8-724	Computer Catalog System
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter
8-759	USLIBA - FORTRAN II Subroutines for Binary Data Trasnfer
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-814	PROCES: An Image Processing Program for the PDP-8/e

X. PROBABILITY, STATISTICS, CURVE-FITTING

DECUS NO.	TITLE
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-652	Regression Analysis Package
8-659	VT05
8-660a	STAT
8-661	LESQ, General Non-Linear Least Squares
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals
8-673	Random Number Generators for Use With FORTRAN or SABR Programs
8-690	RANDU
8-704	ANOV1: Analysis of Variance, Unequal N
8-705	ARNORM: Area Under Normal Curve
8-707	CRSTAB: Cross Tabulation Program
8-710	MULTS: Multiple Regression Program
8-745	LEP - Linear, Exponential and Power Function Curve Fit
8-778	PFCF - Polynomial Function Curve Fitting
8-797	LSPCF: Least Squares Polynomial
8-808	Probability Density Functions
8-809	FFT or IFFT of An Analogue Signal

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

DECUS NO.	TITLE
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program
8-617	V. A. PKS.-1 and V.A. PKS.-2, Real Time G. C. Data Integrator and G. C. Data Manipulator
8-620	The PHA-8 Data Acquisition System
8-620A	SINGS - Single Parameter, Single Precision, 1024 Channel, PHA Data Acquisition
8-620B	SINGDP - Single Parameter, Double Precision, 1024 Channel, PHA Data Acquisition and Display
8-620C	PK8L - 1024 Channel Off-Line Peak Location and Listing
8-620D	SING8K - Single Parameter, Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display
8-620E	PK8K - 4096 Channel Off-Line Peak Location and Listing
8-626	Automated Electrooculography
8-630	Pulmonary Function Laboratory Programs
8-638	GEOMAS
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)
8-648	LOGMIN - Logic Minimization Program
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-657A	INPUT - A Neurophysiological Data Collecting Program
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements
8-665	INTVAL - A Subroutine to Measure Inter-Event Intervals
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals
8-669	BIOLSD - Antibiotic Assay Using Latin Square Design
8-680	WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System
8-712	IRSPEC: Calculation "On Line" of Far Infrared Spectra by Fourier Transform
8-718	NSD - Nominal Standard Dose
8-725	The Pipe Stress Problem on a PDP-8/F
8-740	Theorem Prover for the Propositional Calculus
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel
8-767	Critical Path Method of Scheduling
8-773	Graphics Package for the Tektronix 4010 Under Os/8
8-781	DOCRLN - A Subroutine to Calculate Polarity-Quantized Autocorrelograms
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System
8-794	IFAC
8-799	Dose Calculation of Irregular Fields
8-800	Heat Loss Calculation
8-802	SSP Scientific Subroutine Package
8-813	DIGFIL: Recursive Digital Filter
8-814	PROCES: An Image Processing Program

XII HARDWARE CONTROL

DECUS NO.	TITLE
8-614	Clock Calibration
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-622	KV8/I - VTØ1 Device Handler
8-645	Interfacing the PDP-8 to the Printec-100 Line Printer
8-694	Teletype Line Printer Emulator Handler for OS/8
8-719	OS/8 Software for a TC58 Magtape Control
8-739	COPY.PA
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-787	LISZ - An Extended ISZ Instruction for the PDP-8/L
8-788	Using the RAR RAL Micro-Instruction as an Auxiliary Command
8-795	RINROT: A Roll-in, Roll-out Program
8-805	PTRP. PA

XIII. GAME DEMONSTRATION

8-643	LIFE
8-647	FULMIX - Complete Permutation Program
8-686	Bowling League Results, Standings and Averages
8-687	GOLF
8-688	FOOTBALL
8-700	JET AMBUSH
8-729	DS340 Demo Package
8-738	The Business Management Laboratory
8-750	Paper Tape Display
8-804	Music Program
8-810	Ping: Ping-Pong Game on Display

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XIV. PLOTTING

DECUS NO.	TITLE
8-629	Graphing Subroutines for 8K FORTRAN Programs
8-670	Basic Plotting Package for OS/8 FORTRAN IV
8-713	FORTRAN Plotting Subroutines
8-715	F4 GRAPHICS
8-738	The Business Management Laboratory
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
8-817	LABCOL: Laboratory Control and Automation Language

XV. DESK CALCULATOR, BUSINESS APPLICATION

8-607	CALCU1
8-610	INVENT-8
8-703	AMORT: Incremental Amortization Schedule
8-709	FINCA: A Computer Program for Financial Statement Analysis
8-724	Computer Catalog System
8-729	DS340 Demo Package
8-738	The Business Management Laboratory

XVI. MAINTENANCE

8-608	FUTIL - OS/8 File Utility
8-614	Clock Calibration
8-624	DUMP and LOAD, TSS/8
8-744	TSTCDR - TSS/8 Card Reader Diagnostic

XVII. MISCELLANEOUS

DECUS NO.	TITLE
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2
8-616	Octal Character Equivalent
8-654	Cabrillo Test Grader
8-656	SELFDRILL - The Sloan Selfdrill Program
8-679	MAPPER
8-686	Bowling League Results, Standings and Averages
8-693	A Programmed Learning Course in Boolean Algebra
8-701	TEXT: Readable Punch Handler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator
8-769	SELFDR - The Selfdrill Program, 8K Version
8-792	PROVE-8, V.03
8-801	MORSE: Morse Code - Coder and Decoder

PAYMENT

All DECUS service charges are to help defray the cost of reproduction, handling and postage. All orders must be accompanied by cash, DECUS Coupons or Purchase Order. Please make checks payable to DECUS.

Because of the difficulties encountered by many installations in obtaining Purchase Orders for small amounts, DECUS Coupons may be ordered for any amount and used as subsequent payment for DECUS orders. Coupons are available in $1.00 and $5.00 denominations. They may be ordered as DECUS NO. 0051.

Payment for DECUS Coupons must be made in advance. Purchase Orders for coupons must be paid before coupons may be redeemed for DECUS material.

All charges are in U. S. Dollars. A $2.00 invoicing charge is added to all orders which are not prepaid.

All charges are subject to change without notice.

European Users - Payment may be made in your currency to: Martha Ries, Digital Equipment Co., Int'l-Europe, Case Postale 340, 1211 Geneva 26, Switzerland. Please refer to currency exchange charts available from that office.

Australian Users and New Zealand Users - Payment may be made in your currency to DECUS Australia, P. O. Box 491, Crows Nest, NSW, 2065 Australia. Please refer to currency exchange charts available from that office.

WRITE-UPS

With certain exceptions single copies of associated write-ups are automatically included at no charge with programs ordered and with all library tapes.

Most write-ups may also be requested without tapes. Reasonable requests (usually 15 or fewer write-ups) will be filled without charge. When more than 15 individual write-ups are requested, a service charge of fifteen cents (15¢) per write-up will apply. EXCEPTIONS: Write-ups for which an individual service charge is indicated.

Requests for multiple copies of the same write-up will be charged at a rate of $1.00 per copy (first copy free), or at the service charge indicated.

Complete sets of current write-ups for each library are available. Service Charges are:

PDP-8	$120.00
BASIC8	15.00
FOCAL8	50.00
PDP-12	25.00
PDP-11	45.00
RSTS11	40.00
PDP-6/10 & 10 (combined)	35.00
PDP-9 & 15 (combined)	25.00

TAPES

In some cases it is possible to pack programs on DECtape. Such cases will be considered on an individual basis. Please contact the appropriate DECUS Library Controller for specific information.

Programs customarily distributed on paper tape will not be packed on DECtape.

RSTS-11 programs are on disk and can be transferred to any distribution media (paper tape, DECtape, magtape or disk). Service charges will vary according to the media involved. Contact the PDP-11 controller for complete information.

All User Supplied DECtapes must be new and formatted. DECUS cannot/ will not copy programs to unformatted tapes.

When it is indicated that certain programs occupy the same tape, only one service charge will apply for any combination of programs on that tape. (Library Tapes excluded.)

When requesting magtapes, the user should specify whether 7 track or 9 track tapes are needed.

LIBRARY TAPES

There are four Library LINCtapes of PDP-12 programs. Contents of tapes and applicable Service Charges are:

TAPE	DECUS NO's.	USER TAPE	DECUS TAPE
1	12-1,2,4	$15.00	$25.00
2	12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	35.00	45.00
3	12-22, 23, 25, 30, 31, 32, 33 35, 36, 37, 41, 42, 43, 44	35.00	45.00
4	12-45, 46, 47, 51, 54, 55, 56, 57	25.00	35.00

Three Library Magtapes of DECsystem-10 programs are available from DECUS. The tapes are Failsafe, 7 or 9 track, 800 or 556 BPI. If not specified, tapes will be copied 9 track at 800 BPI. Write-ups are supplied, at no charge, for each Library Tape issued.

Tape #1a includes all currently announced 6/10 programs, plus all programs from 10-1 through 10-99 which have been announced as currently available, with the exception of 10-14, 10-34a and 10-86b.

Tape #2a includes all programs from 10-103 through 10-200 which have been announced as currently available, with the exception of 10-176, 10-179a and 10-199.

Tape #3 includes all programs from 10-201 through 10-231 which have been announced as currently available, with the exception of 10-210, 10-213, 10-215, 10-223, 10-224 and 10-227.

Servicecharges quoted are for each library tape, NOT for any combination of tapes. Requests for 9 track, 800 BPI require one 2400' Magtape for either Tape #1a or #2a. 7 or 9 track 556 BPI or 7 track 800 BPI may in some cases require an additional 600' Magtape.

Service charges for library tapes are:

	Library Tape #1a or #2a (2400' magtape)	Library Tape #3 (1200' magtape)
DECUS supplied tape	$125.00	$50.00
User supplied tape(s)	$100.00	$30.00
DECUS supplied 600' tape	$ 15.00	

Users who received previous versions of either tape #1 or tape #2 (a) may request the updated tapes by indicating date of the original purchase order, invoice or letter of credit (specify which) and in whose name the original order was issued.

Service charges for updating library tapes are:

DECUS supplied tape	$50.00
User supplied tape(s)	$25.00
DECUS supplied 600' tape	$15.00

Library Tapes previously ordered will not be automatically updated.

Programs not included on Library Tapes may be obtained as shown in catalog.

DECUS NO.	TITLE
8-600c	EXPIP (Extensions PIP)
8-606b	PIP11
8-607	CALCU1
8-608	FUTIL - OS/8 File Utility
8-609	OCOMP - Octal Compare and Dump
8-610	INVENT-8
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control
8-622	KV8/I - VTØ1 Device Handler
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine
8-632	RWDF32
8-633	MAC8, 8K MACRO ASSEMBLER
8-634	MOVE
8-635	PAL12D
8-638	GEOMAS
8-639	OS/8 DISASM
8-640	OS/8 EDIT PLUS
8-641	OS/8 FORMAT
8-643	LIFE
8-646	DECsystem-8
8-649	QPIP - OS/8 Directory Editing Program
8-650	AMIPED - Automated Medical Interview With Pediatric Data Files
8-659	VT05
8-660a	STAT
8-661	LESQ, General Non-Linear Least Squares
8-670	Basic Plotting Package for OS/8 FORTRAN IV
8-677	STAR PIP
8-690	RANDU
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System
8-694	Teletype Line Printer Emulator Handler for OS/8
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
8-701	TEXT: Readable Punch Handler for OS/8
8-703	AMORT: Incremental Amortization Schedule
8-704	ANOV1: Analysis of Variance, Unequal N
8-705	ARNORM: Area Under Normal Curve
8-706	BITSET
8-707	CRSTAB: Cross Tabulation Program
8-708	EMLP: Emory Linear Programming Package
8-709	FINCA: A Computer Program for Financial Statement Analysis
8-710	MULTS: Multiple Regression Program
8-711	Microprocessor Cross Reference Program for OS/8
8-713	FORTRAN Plotting Subroutines
8-715	F4 GRAPHICS
8-717a	F4 EAE - EAE Overlay for FRTS
8-718	NSD - Nominal Standard Dose
8-719	OS/8 Software for a TC58 Magtape Control
8-724	Computer Catalog System
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer
8-731	MEMO IV
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC
8-734	Microprocessor Language Assembler for OS/8
8-735	DSP8; Diagnostic Support Package for the PDP-8
8-738	The Business Management Laboratory
8-739	COPY.PA
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape
8-745	LEP - Linear, Exponential and Power Function Curve Fit
8-746	Device Handler for Tektronix 611 Storage Scope
8-747	STAGE2 MACRO Processor
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter
8-753	OS/8 System Output Handlers
8-754	NUMBER and REDATE - OS/8 File Utility Programs
8-756	ASCON- ASCII File Converter
8-757	OS/8 Utility Package
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E
8-759	USLIBA - FORTRAN II Subroutine for Binary Data Transfer
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device
8-764	LIST
8-765	DUMPOS - Dumps OS/8 ASCII Files
8-769	SELFDR - The Selfdrill Program, 8K Version
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems
8-773	Graphics Package for the Tektronix 4010 Under OS/8
8-775	COPIER
8-778	PFCF - Polynomial Function Curve Fitting
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape
8-780	SPLIT and SPLICE
8-782	DEVHND - Device Handler for Storage Scope Using AX08 (LAB-8) As Controller
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-789	RKCOPY
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV
8-794	IFAC - A FORTRAN Program for Parameter Estimation
8-795	RINROT: A Roll-in, Roll-out Program
8-798	OS/8 to RSTS Interface
8-799	Dose Calculation of Irregular Fields
8-802	SSP: Scientific Subroutine Package
8-803	FOLMAT
8-814	PROCES: An Image Processing Program

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DECUS NO.	TITLE
8-815	BINPUN: OS/8 Binary Punch from Core Image Files
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for SCOPE and Incremental plotter
8-817	LABCOL I: Laboratory Control and Automation Language
FOCAL8-301	U/W FOCAL
FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971
FOCAL8-328	CONVM: Interconversion of Mass and Volume Units

FUTURE SUBMISSIONS AND ANNOUNCEMENTS SHOULD BE CATEGORIZED USING THIS LIST

DECUS PROGRAM LIBRARY CATEGORY CODES*

00. Utility (External) Programs

- 0 Unclassified
- 1 Multiple Utility
- 2 Flowcharting
- 3 Magnetic Tape Handling
- 4 Paper Tape Handling
- 5 Disk Handling
- 6 Drum and Direct Data Devices
- 7 Graphic Display Devices
- 8 Remote Data Acquiaition

01. Utility (Internal) Programs

- 0 Unclassified
- 1 Loading
- 2 Clear/Reset Memory
- 3 Check Sum Accumulative and Correction
- 4 Internal Housekeeping
- 5 Dump to Reload/Restore Operations
- 6 File Organization
- 7 Self Checking Digit
- 8 Packed Data Handlers
- 9 Duplicators/Verifiers

02. Diagnostics

- 0 Unclassified
- 1 Status Recorders
- 2 Hardware Maintenance

03. Programming Systems

- 0 Unclassified
- 1 Assemblers
- 2 Compilers
- 3 Interpretive Systems
- 4 Input/Output Control
- 5 Report Generators
- 6 Preprocessing and Editing
- 7 Macros and Macro Generators
- 8 Functions and Subroutines
- 9 Desk Calculators

04. Testing and Debugging

- 0 Unclassified
- 1 Dumping
- 2 Tracing
- 3 Test Data Preparation
- 4 Testing Systems
- 5 Break Point Printing
- 6 Memory Verification and Searching
- 7 On-Line (DDT Type) Debuggers

05. Executive Routines

- 0 Unclassified
- 1 Monitor
- 2 Supervisors
- 3 Disassembly and Derelativizing
- 4 Relativizing
- 5 Relocation

06. Data Handling

- 0 Unclassified
- 1 Sorts
- 2 Merges
- 3 Data Transmission
- 4 Table Operation
- 5 Conversion and/or Scaling
- 6 Character and Symbol Manipulation
- 7 Information Classification, Storage, and Retrieval
- 8 List Processing
- 9 Typesetting

07. Input/Output

- 0 Unclassified
- 1 Binary
- 2 Octal
- 3 Decimal
- 4 BCD
- 5 Hexadecimal
- 6 Composite
- 7 ASCII
- 8 Plotting
- 9 Display

10. Systems Analysis

- 0 Unclassified
- 1 Network Design
- 2 File and Core Requirement
- 3 System Design
- 4 Configuration

11. Simulation of Computers and Components

- 0 Unclassified
- 1 Computers
- 2 Peripheral Equipment
- 3 System Component or Feature
- 4 Pseudo-Computer

12. Conversion of Programs and Data

- 0 Unclassified
- 1 Data Conversion
- 2 Computer Language Translators

*These category (classification) codes have been adopted directly from those established by JUG (Joint User Group)

September 1972

13. Statistical

0 Unclassified
1 Descriptive
2 Univariant and Multivariant Parametric
3 Non-Parametric
4 Time Series and Auto Correlation
5 Probability Distribution Sampling and Random Number Generators
6 Correlation and Regression Analysis
7 Analysis of Variance and Covariance
8 Sequential Analysis
9 Discriminant Analysis

15. Management Science/Operations Research

0 Unclassified
1 Simulations
2 Linear Programming
3 Non-Linear Programming
4 Scheduling/Critical Path/PERT/LESS
5 Games, Game-like Models and Game Theory
6 General Problem Solvers
7 Inventory Control

16. Engineering

0 Unclassified
1 Aeronautical
2 Civil
3 Chemical
4 Electrical
5 Mechanical and Hydraulic
6 Petroleum
7 Nuclear
8 General
9 Simulation

17. Sciences and Mathematics

0 Unclassified
1 General
2 Nuclear Physics
3 Chemistry
4 Geology, Oceanography, Oceanology and Geophysics
5 Biology
6 Social and Behavior
7 Astronomy and Celestial Navigation
8 Simulation
9 Pure Mathematics

18. Nuclear Codes

0 Unclassified

19. Financial

0 Unclassified
1 Inverting and Borrowing
2 Capital Stock
3 Taxes
4 Cash Custody and Forecasting
5 General Accounting
6 Auditing
7 Banking Operations

20. Cost Accounting

0 Unclassified
1 Material Only
2 Labor Only
3 Work in Progress

21. Payroll and Benefits

0 Unclassified
1 Payroll
2 Employee Benefits
3 Profit Sharing
4 Retirement
5 Insurance
6 Credit Union

22. Personnel

0 Unclassified
1 Recruiting and Hiring
2 Inventorying Employees
3 Training
4 Performance Review
5 Administering Wages and Salaries

23. Manufacturing

0 Unclassified
1 Scheduling/Loading
2 Job Reporting
3 Bill of Materials Processors
4 Numerical Control
5 Control Systems

24. Quality Assurance/Reliability

0 Unclassified
1 Testing
2 Performance Analysis

25. Inventory

0 Unclassified
1 Stocking and Issuing
2 Inventory Analysis
3 Equipment and Tool Inventory and Maintenance

26. Purchasing

0 Unclassified
1 Preparing Purchase Orders
2 Matching Invoices
3 Accounts Payable
4 Purchase Analysis

27. Marketing

0 Unclassified
1 Sales and Billings Forecasting
2 Promotion and Advertising
3 Bid or Request Analysis
4 Distribution or Territory Analysis

28. Sales Entered and Billed

0 Unclassified
1 Order Entry and Scheduling
2 Invoicing
3 Accounts Receivable
4 Sales and Billing Analysis
5 Backlog Reporting

29. General Business Services

0 Unclassified
1 Records Retention
2 Forms Management
3 Transportation
4 Printing and Reproduction

30. Demonstrations and Games

0 Unclassified
1 Display
2 Participation

40. Arithmetic Routines

0 Unclassified
1 Real Numbers
2 Complex Numbers
3 Decimal
4 Floating Point

41. Elementary Functions

0 Unclassified
1 Trigonometric
2 Hyperbolic
3 Exponential and Logarithmic
4 Roots and Powers
5 Geometry
6 Logical and Rounded

42. Polynomials and Special Functions

0 Unclassified
1 Evaluation of Polynomials
2 Roots of Polynomials
3 Evaluation of Special Functions
4 Simultaneous Non-Linear Algebraic Equations
5 Simultaneous Transcendental Equations

43. Operations on Functions and Solutions of Differential Equations

0 Unclassified
1 Numerical Integrations
2 Numerical Solutions of Ordinary Differential Equations
3 Numerical Solutions of Partial Differential Equations
4 Numerical Differentiation

44. Interpolation and Approximations

0 Unclassified
1 Table Look-up and Interpolation
2 Curve Fitting
3 Smoothing

45. Operations on Matrices, Vectors and Simultaneous Linear Equations

0 Unclassified
1 Matrix Operations
2 Eigenvalues and Eigenvectors
3 Determinates
4 Simultaneous Linear Equations
5 Vector Analysis

50. Insurance

0 Unclassified
1 Life
2 Fire
3 Pension and Welfare

61. Education

0 Unclassified
1 Demonstrations
2 Problem Solving
3 Record Keeping

62. Literary Data Processing

0 Unclassified
1 General
2 Language and Literature
3 Linguistics
4 Language Translation
5 Concordances
6 Content Analysis
7 Text Editing
8 Bibliographic Analysis
9 Text Manipulation

63. Humanities

0 Unclassified
1 General
2 Music
3 History
4 Art

71. Hybrid Computing

0 Unclassified
1 Analog/Digital, Digital/Analog Conversion
2 Real Time Computing
3 Simulation

72. Time Sharing

0 Unclassified

99. Miscellaneous

0 Unclassified

DECUS PROGRAM LIBRARY
PDP-8 NUMERICAL INDEX
VOLUME II

No.	TITLE	MEDIA/PRICE CODES
8-600c	EXPIP (Extensions PIP)	A01, H12, W00
8-601	OASIS	A01, F02, W00
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2	D01, G08
8-603	PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program	D01, F02, G06
8-604	'GET' Command for the Disk/DECtape Monitor System	A01, F02, G02, W00
8-605	ADUMP8	D01, F02, G02
8-606b	PIP11	D01, G08
8-607	CALCU1	D01, F02, G02, H12
8-608	FUTIL - OS/8 File Utility	A01, H12, W00 ┐ Same DECtape; Includes FOCAL8-269
8-609	OCOMP - Octal Compare and Dump	┘
8-610	INVENT-8	A01, H12, W00
8-611	SLED - Source and Listing Editor	D01, F02, G02
8-612	ELAN - Elementary Linguistic Analysis	A01, B07, F02, G06
8-613	Interconversion Between A/D Floating Point and D/A Formats	D01, F02, G02
8-614	Clock Calibration	D01, F02, G06
8-615	EAE Multiplication for 8K FORTRAN	D01, F02, G02
8-616	Octal Character Equivalent	D01, F02, G02
8-617	V. A. PKS.-1 and V. A. PKS.-2 Real Time G. C. Data Integrator and G. C. Data Manipulator	A01, F06, G08, B07
8-618	Two OS/8 Device Handlers for the 57A Magnetic Tape Control	D01, G06
8-619	FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System	D01, G06
8-620	The PHA-8 Data Acquisition System	A01, W00
8-620A	SINGS - Single Parameter, Single Precision 1024 Channel, PHA Data Acquisition	A01, B07, F02, G06
8-620B	SINGDP - Single Parameter, Double Precision 1024 Channel, PHA Data Acquisition and Display	A01, B07, F02, G06
8-620C	PK8L - 1024 Channel Off-Line Peak Location and Listing	A01, B07, F02, G06

No.	TITLE	MEDIA/PRICE CODES	
8-620D	SING8K - Single Parameter, Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display	A01, B07, F02, G06	
8-620E	PK8K - 4096 Channel Off-Line Peak Location and Listing	A01, B07, F02, G06	
8-621	Gray Code Conversion Package	A01, G02, W00	
8-622	KV8/I - VTØ1 Device Handler	D01, G06	
8-623	PAGER	D01, F02, G02	
8-624	DUMP and LOAD, TSS/8	A01, F02, G08, W00	
8-625	Floating Integer Function for use with 8K FORTRAN	D01, G02	
8-626	Automated Electrooculography	D01, F02, G02	
8-627	TEXPAK - Program to Convert a Line of Text to Packed Octal Format	D01, F02	
8-628	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)	A01, B08, H12	
8-629	Graphing Subroutines for 8K FORTRAN Program	D01, F02, G02	
8-630	Pulmonary Function Laboratory Program	A01, W00	
8-630A	(Spirometry Only)	F02, W00	
8-630B	8K Paper Tape System	F06, W00	
8-630C	(For non-ROM systems request binary paper tape loader in addition to DTA)	F02, H12	
8-630D	8K TC08/TU56	H12, W00	
8-630E	(Contains binaries and sources for 4K and 8K paper tape systems)	H12, W00	
8-631	MINT - Multiple Precision Integer Arithmetic Subroutine	A01, H12, W00	Same DECtape (obj,src)
8-632	RWDF32	A01, H12, W00	
8-633	MAC8, 8K MACRO ASSEMBLER	A01, H12, W00	
8-634	MOVE	A01, H12, W00	
8-635	PAL12D	A01, H12, W00	
8-636	BEST - Binary to Symbolic Traductor	A01, F02	
8-637	A Flexible Data Buffer Display Routine for LAB-8 Systems	D01, G02	
8-638	GEOMAS	D01, G02	
8-639	OS/8 DISASM	A01, B07, F02	
8-640	OS/8 EDIT PLUS	A01, B07, F02	
8-641	OS/8 FORMAT	D01, G02	

No.	TITLE	MEDIA/PRICE CODES
8-642	AUTOCO - Autocorrelation for Poor People (Without EAE)	D01, F02
8-643	LIFE	D01, G02
8-644	MINMON - TD8E DECtape Minimonitor	D01, F02, G02
8-645	Interfacing the PDP-8 to the Printec-100 Line Printer	D01, F02
8-646	DECsystem-8	A01, H12, J11, W00
8-647	FULMIX - Complete Permutation Program	A01, F02, W00
8-648	LOGMIN - Logic Minimization Program	A01, F02, W00
8-649	QPIP - OS/8 Directory Editing Program	A01, G06, W00
8-650	AMIPED- Automated Medical Interview With Pediatric Data Files	D01, G06
8-651	SOLMT (Sort Overlay Listings Using Magnetic Tape)	A01, B07, H12
8-652	Regression Analysis Package	D01, F06 (Test Tapes Included)
8-653	MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O	A01, F06, W00
8-654	Cabrillo Test Grader	D01, F02
8-655	Patches to CINET-BASIC (DECUS NO. 8-159)	D01, F02
8-656	SELFDRILL - The Sloan Selfdrill Program	A01, B12, F02, G10
8-657A	INPUT, A Neurophysiological Data Collecting Program	A01, B08, F02, G12
8-657B	DSKFIL, A File Structured Disk Writing Routine and Helpers	A01, B05, F02, G06
8-657C	TR, Binary to ASCII Translator	A01, B05, F02, G06
8-658	Extended Double Precision Interpretive Package	D01, F02, G06
8-659	VT05	D01, H12
8-660	STAT	A01, H12, W00
8-661	LESQ, General Non-Linear Least Squares	A01, H12, W00
8-662	UNDEFSYBLIST - Undefined Symbol List	D01, F02, G02
8-663	REPROD - Read, Punch and Verify Product	D01, F02, G02
8-664	FREQHS - A Subroutine to Generate a Frequency Histogram from Stored Interval Measurements	D01, G02
8-665	INTVAL - A Subroutine to Measure Inter-Event Intervals	D01, G02
8-666	NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals	D01, G02

No.	TITLE	MEDIA/PRICE CODES
8-667	LABLDP - A TSS/8 Tape Labeling Program	D01, F02, G02
8-668	RAW - A Reverse Assembler of Windsor	A01, B07, F02, G06
8-669	BIOLSD - Antibiotic Assay Using Latin Square Design	A01, B07, F06, G06
8-670	Basic Plotting Package for OS/8 FORTRAN IV	D01, F06, G06, H12
8-671	Restoring Symbolprint	D01
8-672	XCBL and XBIN Loader	D01, F02, G02
8-673	Random Number Generators for Use With FORTRAN or SABR Programs	D01, F02
8-674	External - Or RC - Clock (AXØ8) Calibration	D01, F02, G02
8-675	INDUMP - Input Dump	D01, F02, G02
8-676	MOVE DELETE	D01, F02, G02
8-677	STAR PIP	A01, H12, W00 *
8-678	Routine to Expand and Modify the DEC Floating-Point Package	D01, G06
8-679	MAPPER	D01, G02
8-680	WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions	A01, G02, W00
8-681	CASE - Carleton Symbolic Editor	A01, B07, F02, G08
8-682	SCPSYS (Scope System)	A01, H12, W00
8-683	BNLOAD, TSS/8 Binary Loader	D01, F02, G02
8-684	Injection Patcher - IJPA	A01, F02, G06, W00
8-685	DPSQRT - Double Precision Square Root for PDP-8	D01, G02
8-686	Bowling League Results, Standings and Averages	A01, G06, W00
8-687	GOLF	A01, G06, W00
8-688	FOOTBALL	A01, G06, W00
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program	D01, G02
8-690	RANDU	D01, F02, G02
8-691	ACCK Timeshare Accounting System	A01, W00 (DECtape available from author)
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System	A01, H12, W00
8-693	A Programmed Learning Course in Boolean Algebra	A01, G06, W00
8-694	Teletype Line Printer Emulator Handler for OS/8	D01, G02

* Same DECtape as 8-445, 8-497A, 8-530, 8-531A&B

No.	TITLE	MEDIA/PRICE CODES	
8-695	Real Time Display Processor for a KV8 Graphic System and KW8 Clock	D01, F02, G06	
8-696	DECTYP, One-Word Signed Decimal Print	D01, G02	
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - Edusystem50)	D01, F02, G02	
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010	D01, F02, G02	
8-699	MPS External Event Common Routines	D01, G02	
8-700	JET AMBUSH	D01, F02	
8-701	TEXT: Readable Punch Handler for OS/8	D01, F02, G02	
8-702	COGO-8	A01, B12, H23	
8-703	AMORT: Incremental Amortization Schedule	D01, H12	Same DECtape
8-704	ANOV1: Analysis of Variance, Unequal N	D01, H12	
8-705	ARNORM: Area Under Normal Curve	D01, H12	
8-706	BITSET	D01, H12	
8-707	CRSTAB: Cross Tabulation Program	D01, H12	
8-708	EMLP: Emory Linear Programming Package	D01, H12	
8-709	FINCA: A Computer Program for Financial Statement Analysis	D01, H12	
8-710	MULTS: Multiple Regression Program	D01, H12	
8-711	Microprocessor Cross Reference Program for OS/8	A01, F02, W00	
8-712	IRSPEC: Calculation "On-Line" of Far Infrared Spectra by Fourier Transform	A01, F02, W00 *	
8-713	FORTRAN Plotting Subroutines	A01, H12, W00	
8-714	PDPLST: PDP-8 IBM 360/370 Cross Listing Program	D01, R12	
8-715	F4 GRAPHICS	D01, H12, J11	
8-716	Exponential Functions	D01, F02, G06	
8-717	F4EAE - EAE OVERLAY FOR FRTS	D01, F02, G02	
8-718	NSD - Nominal Standard Dose	D01, H12	
8-719	OS/8 Software for a TC58 Magtape Control	A01, B07, F02, G06, H12	
8-720	LSTDMP: Binary Tape Dump/Lister	D01, F02, G02	
8-721	LISP-8K	A01, F02, W00	
8-722	Mini-Copy	D01	
8-723	Function Comp.FT	D01, G02	
8-724	Computer Catalog System	D01, G06	

* DECtape available from author; Write-up in French

No.	TITLE	MEDIA/PRICE CODES
8-725	The Pipe Stress Problem on a PDP-8/F	A01, B07, F02
8-726	An OS/8 Handler for the Varian Statos 21 Line Printer	D01, F02, G02
8-727	Disassembler	D01, F02
8-728	MEND	D01, F02
8-729	DS340 DEMO Package	A01, W00 *
8-730	CORVU: A Display and Teletype Input/ Output Program	D01, F02, G06
8-731	MEMO IV	A01, H12, W00
8-732	BAVIRF - A Virtual File UDEF for OS/8 BASIC	D01, G02
8-733A	PDP-8/E RJE System (IBM 2780 Emulator)	A01, B07, F06, H12
8-733B	Software Support Manual for PDP-8/E RJE System	A05, W00
8-734	Microprocessor Language Assembler for OS/8	A01, F02, W00
8-735	DSP8; Diagnostic Support Package for the PDP-8	A01, B07, F02, G02, H12
8-736	Paper Tape Reader-Printer	D01, F02, G06
8-737A	Four Word Floating Point Package for MPS	A01, F02, W00
8-737B	Four Word Floating Point Functions for MPS	A01, F02, W00
8-737C	Rudimentary Calculator for MPS Four Word Floating Point Routines	D01, F02
8-738	The Business Management Laboratory	A01, H16, W00
8-739	COPY.PA	A01, F02, G02, W00
8-740	Theorem Prover for the Propositional Calculus	A01, G02, W00
8-741	SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape	D01, H12
8-742	CLOCK - A Real-Time Clock/Calendar Routine	D01, F02, G02
8-743a	FILFIX - TSS/8 File Structure Repairing and Restructuring Program	A01, B07, F02
8-744	TSTCDR - TSS/8 Card Reader Diagnostic	D01, F02
8-745	LEP, Linear, Exponential and Power Function Curve Fit	D01, H12
8-746	Device Handler for Tektronix 611 Storage Scope	A01, G02, W00
8-747	STAGE2 MACRO Processor	A02, B12, F06, G08
8-748	SMØ4 - OS/8 to Disk-Monitor ASCII File Converter	D01, G02
8-749	UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined Functions for OS/8 BASIC	A01, B07, G06

* Tapes available from DIGITAL Business Products

No.	TITLE	MEDIA/PRICE CODES
8-750	Paper Tape Display	D01, F02
8-751	FORTRAN IV for OS/8 FORTRAN II Users	A01, W00
8-752	MIG8E2 - Monitor of Interruptions Which Are Generated by the PDP-8/E Peripherals	A01, H12, W00
8-753	OS/8 System Output Handlers	A01, B05, F02, H12
8-754	NUMBER and REDATE - OS/8 File Utility Programs	A01, B05, F02, H12
8-755	OCTYPE - Octal Memory Dump	D01, F02
8-756	ASCON - ASCII File Converter	A01, F02, J11, W00
8-757	OS/8 Utility Package	A01, H12, W00
8-758	Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E	D01, F02, G02
8-759	USLIBA - FORTRAN II Subroutines for Binary Data Transfer	D01, F02, G06
8-760	FASTAD - User Oriented Data Collection on One A/DC Channel	A01, B07, F02, G08
8-761	WDATA - Subroutine to Write Absolute Binary Data on SYS-Device	D01, F02, G06
8-762	TTYIO - I/O Routines for Teletype or Similar Terminal	D01, F02, G06
8-763	KL8TST - KL8/E, KL8/J Diagnostic	D01, G02
8-764	LIST	D01, F02, G06
8-765	DUMPOS - Dumps OS/8 ASCII Files	D01, F02, G02
8-766	SIMBA - A PDP-8/E Oscilloscope Symbol Generator	D01, F02, G02
8-767	Critical Path Method of Scheduling	D01, F06
8-768	EDAS - Editing and Assembling System	D01, F02, G02
8-769	SELFDR - The Selfdrill Program, 8K Version	A01, B12, H12
8-770	MOSS - 4K TD8E DECtape System	A01, H12, W00
8-771	PRGSCH - TSS/8 Program Searcher	D01, G02
8-772	OS/8 Compatible VC8-E Handler for Mass Storage Systems	D01, H12
8-773	Graphics Package for the Tektronix 4010 Under OS/8	A01, H12, W00
8-774	Simple ASCII Editor and Tape Reproducer	D01, F02, G02
8-775	COPIER	A01, G02, W00
8-776	BNPF Format Paper Tape Loader for MPS	D01

Same DEC-tape (obj, src, doc)

No.	TITLE	MEDIA/PRICE CODES
8-777	PDP8ASM, Version 3.01	A01
8-778	PFCF - Polynomial Function Curve Fitting	D01, H12
8-779	TC58.PA - OS/8 Version III Device Handler for TC58 Magtape	D01, H12
8-780	SPLIT and SPLICE	A01, B07, F02
8-781	DOCRLN - A Subroutine to Calculate Polarity-Quantized Autocorrelograms	D01, F02, G02
8-782	DEVHND - Device Handler for Storage Scope Using AXØ8 (LAB-8) as Controller	D01
8-783	EDITV - Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III	D01
8-784	TSS/8 TTRACE and TSS/8 LTRACE	D01, H12
8-785	GPATCH	D01, H12
8-786	TSS/8 FORMAT	D01, H12
8-787	LISZ - An Extended ISZ Instruction for the PDP-8/L	A01, W00
8-788	Using the RAR RAL Micro-Instruction as an Auxiliary Command	A01, W00
8-789	RKCOPY	A01, F02, G06, W00
8-790	CHRDIS - Display Alphanumeric Characters on ND-50/50 System	D01, F02
8-791	DELAY	D01, F02, G02
8-792	PROVE-8, V.03	A01, B07, F02
8-793	RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV	D01, G02
8-794	IFAC - A FORTRAN Program for Parameter Estimation	D01
8-795	RINROT - A Roll-in, Roll-out Program	D01, F02, G02
8-796	Five Word Floating Point Package for PDP-8	A01, B07, F02, G06
8-797	LSPCF	A01, B07, F02, G06
8-798	OS/8 to RSTS Interface	D01, G06
8-799	Dose Calculation of Irregular Fields	D01, H12
8-800	Heat Loss Calculation	D01, F02
8-801	MORSE - Morse Code Coder and Decoder	A01, B07, F02, G06
8-802	SSP: Scientific Subroutine Package	H25, W00, Y00
8-803	FOLMAT	D01, B05, F02, G02, H12

No.	TITLE	MEDIA/PRICE CODES
8-804	MUSIC: PDP-8 Music Playing Program	A01, F02, H12, K14, W00
8-804.1	The Entertainer	A01, G02, W00
8-804.2	Love Will Keep Us Together, others	A01, G02, W00
8-804.3	Minute Waltz	A01, G02, W00
8-804.4	Bach, Inventions	A01, G02, W00
8-805	PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and Punch	D01, G02
8-806	SAC8: Simulation of An Analogue Computer	D01, F02, G02
8-807	UTILITY Routine and Patches for the FORTRAN Compiler	D01, F02, G02
8-808	Probability Density Functions of Analogue Signals with the LAB-8 System	A01, F02, W00
8-809	FFT or IFFT of an Analogue Signal with the LAB-8 System	A01, B12, F02
8-810	PING: Ping-Pong Game on Display	D01, F02, G06
8-811	DYNOD: Dynamic Octal Debugger	D01, F02, G02
8-812	CASINO: Sykes Cassette Input/Output	D01, F02, G02
8-813	DIGFIL: Recursive Digital Filter	D01, F02, G06
8-814	PROCES: An Image Processing Program for the PDP-8/E	A01, B12, H12
8-815	BINPUN: OS/8 Binary Punch from Core Image Files	D01, F02, G02
8-816	PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter	D01, G02
8-817	LABCOL I: Laboratory Control and Automation Language	A01, F02, W00

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-600b	$ NC	$	$	$	$ 8.	$ 20.	$	$	$	$	1 DTA (src)
8-601	NC	2.									
8-602A	1.*		12.	NC							*NC with tapes
8-602B	1.*		12.	NC							*NC with tapes
8-603	NC	2.	8.	NC							
8-604	NC	2.	2.								
8-605	NC	2.	2.	NC							
8-606b	NC		12.	NC							
8-607	NC	2.	2.	NC	8.	20.					Paper Tape OR 1 DTA
8-608	NC				8.	20.					Tape includes 8-608, 8-609
8-609	NC				8.	20.					& FOCAL8-269
8-610	NC				8.	20.					1 DTA (obj,src)
8-611a	NC	2.	2.	NC							
8-612	NC	2.	8.	10.							
8-613	NC	2.	2.	NC							
8-614	NC	2.	8.	NC							
8-615	NC	2.	2.	NC							
8-616	NC	2.	2.	NC							
8-617	1.*	8.	12.	10.							*NC with tapes
8-618	NC		8.	NC							
8-619	NC		8.	NC							
8-620	NC			*Note							*Listings as quoted below
8-620A	NC	2.	8.	10.							
8-620B	NC	2.	8.	10.							
8-620C	NC	2.	8.	10.							
8-620D	NC	2.	8.	10.							
8-620E	NC	2.	8.	10.							
8-621	NC		2.								
8-622	NC		8.	NC							
8-623	NC	2.	2.	NC							
8-624	NC	2.	12.								
8-625	NC		2.	NC							
8-626	NC	2.	2.	NC							
8-627	NC	2.		NC							
8-628	NC			10.	8.	20.					1 DTA (obj,src)
8-629a	NC	2.	2.	NC							
8-630	2.*										

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS SERVICE CHARGES

DECUS NO.	WRITE-UP	PAPER TAPE BIN	PAPER TAPE ASCII	LISTING	DECTAPE U/S	DECTAPE D/S	LINCTAPE U/S	LINCTAPE D/S	MAGTAPE U/S	MAGTAPE D/S	OTHER INFORMATION
8-630A	$2.*	$2.	$	$	$	$	$	$	$	$	*NC with tapes
8-630B	Same	8.									
8-630C		2.			8.	20.					1 DTA (obj,src)
8-630D	Write-				8.	20.					1 DTA (obj,src)
8-630E	up				8.	20.					1 DTA (obj,src)
8-631	NC				8.	20.					Same DTA (1) (obj,src)
8-632	NC				8.	20.					
8-633	NC				8.	20.					
8-634	NC				8.	20.					
8-635	NC				8.	20.					
8-636	NC	2.									
8-637	NC		2.	NC							
8-638	NC		2.	NC							
8-639	NC	2.		10.							
8-640	NC	2.		10.							
8-641	NC		2.	NC							
8-642	NC	2.		NC							
8-643	NC		2.	NC							
8-644	NC	2.	2.	NC							
8-645	NC	2.		NC							
8-646	NC				8.	20.	8.	18.			1 DTA OR 1 LTA
8-647	NC	2.									
8-648	NC	2.									
8-649	NC		8.								
8-650	NC		8.	NC							
8-651	NC			10.	8.	20.					1 DTA (obj,src, listing)
8-652	1.*	8.		NC							Test tapes included *NC with tapes
8-653	NC	8.									
8-654	NC	2.		NC							
8-655	NC	2.		NC							
8-656	NC	2.	16.	20.							
8-657A	NC	2.	12.	10.							
8-657B	NC	2.	8.	5.							
8-657C	NC	2.	8.	5.							
8-658	NC	2.	8.	NC							
8-659	NC			NC	8.	20.					1 DTA with 8-600b (src)
8-660	NC				8.	20.					1 DTA (src, doc, test data)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

May 1975

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-661	$ NC	$	$	$	$ 8.	$ 20.	$	$	$	$	1 DTA (src,doc)
8-662	NC	2.	2.	NC							
8-663	NC	2.	2.	NC							
8-664	NC		2.	NC							
8-665	NC		2.	NC							
8-666	NC		2.	NC							
8-667	NC	2.	2.	NC							
8-668	NC	2.	8.	10.							
8-669	NC	8.	8.	10.							
8-670	NC	8.	8.	NC	8.	20.					1 DTA
8-671	NC			NC							
8-672	NC	2.	2.	NC							
8-673	NC	2.		NC							
8-674	NC	2.	2.	NC							
8-675	NC	2.	2.	NC							
8-676	NC	2.	2.	NC							
8-677	NC				8.	20.					1 DTA with 8-497
8-678	NC		8.	NC							
8-679	NC		2.	NC							
8-680	NC		2.								
8-681	NC	2.	12.	10.							
8-682	NC				8.	20.					1 DTA (obj,src)
8-683	NC	2.	2.	NC							
8-684	NC	2.	8.								
8-685	NC		2.	NC							
8-686	NC		8.								
8-687	NC		8.								
8-688	NC		8.								
8-689	NC		2.	NC							
8-690	NC	2.	2.	NC							
8-691	NC										DTA available from author
8-692	NC				8.	20.					1 DTA (obj,src)
8-693	NC		8.								
8-694	NC		2.	NC							
8-695	NC	2.	8.	NC							
8-696	NC		2.	NC							
8-697	NC	2.	2.	NC							

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-698	$ NC	$ 2.	$ 2.	$ NC	$	$	$ 8.	$ 18.	$	$	1 LTA for OS/12 users
8-699	NC		2.	NC							
8-700	NC	2.		NC							
8-701	NC	2.	2.	NC							
8-702	2.*			20.	32.	80.					4 DTA *NC with tapes
8-703	NC			NC	8.	20.					Same DTA(1) contains 8-703-710
8-704	NC			NC	8.	20.					
8-705	NC			NC	8.	20.					
8-706	NC			NC	8.	20.					
8-707	NC			NC	8.	20.					
8-708	NC			NC	8.	20.					
8-709	NC			NC	8.	20.					
8-710	NC			NC	8.	20.					
8-711	NC	2.									
8-712	NC	2.									Write-up is in French
8-713	NC				8.	20.					1 DTA (obj,src)
8-714	NC			NC							Card Deck - $20
8-715	NC			NC	8.	20.	8.	18.			1 DTA, 1 LTA
8-716	NC	2.	8.	NC							
8-717	NC	2.	2.	NC							
8-718	NC			NC	8.	20.					1 DTA
8-719	NC	2.	8.	10.	8.	20.					1 DTA
8-720	NC	2.	2.	NC							
8-721	NC	2.									
8-722	NC			NC							
8-723	NC		2.	NC							
8-724	NC		8.	NC							
8-725	NC	2.		10.							
8-726	NC	2.	2.	NC							
8-727	NC	2.		NC							
8-728	NC	2.		NC							
8-729	1.										Tapes available from Bus. Products

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U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

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DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-734	$ 1.	$ 2.	$	$	$	$	$	$	$	$	
8-735	1.	2.	2.	10.	8.	20.					1 DTA (obj,src,doc)
8-736	1.	2.	8.	Inc.							
8-737A	1.	2.									
8-737B	1.	2.									
8-737C	1.	2.		Inc.							
8-738	1.				16.	40.					2 DTA
8-739	1.	2.	2.								
8-740	1.		2.								
8-741	1.			Inc.	8.	20.					1 DTA (obj,src)
8-742	1.	2.	2.	Inc.							
8-743a	1.	2.		10.							
8-744	1.	2.		Inc.							
8-745	1.			Inc.	8.	20.					1 DTA
8-746	1.		2.								
8-747	2.	8.	12.	25.							
8-748	1.		2.	Inc.							
8-749	1.		8.	10.							
8-750	1.	2.		Inc.							
8-751	1.										
8-752	1.				8.	20.					1 DTA (obj,src)
8-753	1.	2.		5.	8.	20.					Same DTA (1) (obj,src,doc)
8-754	1.	2.		5.	8.	20.					
8-755	1.	2.		Inc.							
8-756	1.	2.					8.	18.			1 LTA (obj,src,write-up,listing,SV)
8-757	1.				8.	20.					1 DTA (obj,src)
8-758	1.	2.	2.	Inc.							
8-759	1.	2.	8.	Inc.							
8-760	1.	2.	12.	10.							
8-761	1.	2.	8.	Inc.							
8-762	1.	2.	8.	Inc.							
8-763	1.		2.	Inc.							
8-764	1.	2.	8.	Inc.							
8-765	1.	2.	2.	Inc.							
8-766	1.	2.	2.	Inc.							
8-767	1.	8.		Inc.							
8-768	1.	2.	2.	Inc.							

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
8-769	$ 1.	$	$	$20.	$ 8.	$ 20.	$	$	$	$	1 DTA (obj,src)
8-770	1.				8.	20.					1 DTA (obj,src)
8-771	1.		2.	Inc.							
8-772	1.			Inc.	8.	20.					1 DTA (src)
8-773	1.				8.	20.					1 DTA (obj,src,doc)
8-774	1.	2.	2.	Inc.							
8-775	1.		2.								
8-776	1.			Inc.							
8-777	2.								25.	40.	1 MTA (600')
8-778	1.			Inc.	8.	20.					1 DTA
8-779	1.			Inc.	8.	20.					1 DTA (obj,src,list)
8-780	1.	2.		10.							
8-781	1.	2.	2.	Inc.							
8-782	1.			Inc.							
8-783	1.			Inc.							
8-784	1.			Inc.	8.	20.					1 DTA (sav,src)
8-785	1.			Inc.	8.	20.					1 DTA (src,sav)
8-786	1.			Inc.	8.	20.					1 DTA (src,sav)
8-787	1.										
8-788	1.										
8-789	1.	2.	8.								
8-790	1.	2.		Inc.							
8-791	1.	2.	2.	Inc.							
8-792	1.	2.		10.							
8-793	1.		2.	Inc.							
8-794	1.			Inc.							
8-795	1.	2.	2.	Inc.							
8-796	1.	2.	8.	10.							
8-797	1.	2.	8.	10.							
8-798	1.		8.	Inc.							
8-799	1.			Inc.	8.	20.					
8-800	1.	2.		Inc.							
8-801	1.	2.	8.	10.							
8-802					40.	100.					Tapes only, 5 DTA
8-803	1.	2.	2.	5.	8.	20.					
8-804	1.	2.			8.	20.					2 floppy disks $40.
8-804.1			2.								The Entertainer

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
		$	$	$	$	$	$	$	$	$	
8-804.2			2.								Love Will Keep Us Together, others
8-804.3			2.								Minute Waltz
8-804.4			2.								Bach, Inventions
8-805	1.		2.	Inc.							
8-806	1.	2.	2.	Inc.							
8-807	1.	2.	2.	Inc.							
8-808	1.	2.									
8-809	1.	2.		20.							
8-810	1.	2.	8.	Inc.							
8-811	1.	2.	2.	Inc.							
8-812	1.	2.	2.	Inc.							
8-813	1.	2.	8.	Inc.							
8-814	1.			20.	8.	20					
8-815	1.	2.	2.	Inc.							
8-816	1.		2.	Inc.							
8-817	1.	2.									
8-818	1.			Inc.							

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

GENERAL INFORMATION

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When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

A complete set of all current PDP-8 write-ups (includes Vol. 1 and Vol. 2) is available for a service charge of $75.00.

All user DECtapes must be certified. DECUS cannot/ will not copy programs onto uncertified tapes.

DECUS NO. 8-600b

EXPIP - EXTENSION PIP, Version 5B

Lars Palmer, A B Hassle, Molndal, Sweden

EXPIP is a program that will do file transfers in a more versatile way than PIP. Its main functions are:

a) File transfers are based on extension not file names, but a /S option (selective) makes it possible to transfer any files.

b) It contains a delete function that allows any files to be deleted even 'impossible ones'.

c) It contains a function that much resembles the 'squash using' of DECSYSTEM 8 as described in the OS/8 news letter.

d) It also contains a function to access material from a device with ruined directory blocks (it will allow you to make a file out of any specified blocks).

The file EXPIP.CO contains further information.

Minimum Hardware: 8K PDP-8 with PS/8-OS/8
Source Language: PAL-8

DECUS NO. 8-601

OASIS

Robert Cronin, Belmont Hill School, Belmont, Massachusetts

OASIS is yet another one of the many programs that has PAL III coupled with EDITOR in an 8K machine. It too reads the text image from core, rather than from paper tape. Yet, there are several differences over other versions:

1. Tape punched in XCBL format (See DECUS NO. 8-26C)
2. Virtually no operator intervention at the console is required.
3. It contains a built in "operating system" that performs many minor functions that one does not normally want to bother about when testing out sections of a large program.
4. A provision for immediate testing of small sections of a program.
5. A pseudo CONTROL/C feature is now built in that allows the user to terminate virtually all output without intervention at the console.
6. The system is loaded with RIM only.

Minimum Hardware: 8K PDP-8, ASR33

DECUS NO. 8-602

The PDP-8 Cookbook, Volume 1

Editor: Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

The PDP-8 cookbook is a collection of subroutines at the assembly level for the purpose of instant use.

Minimum Hardware: PDP-8 family
Source Language: PAL

DECUS NO. 8-602B

PDP-8 Cookbook, Volume 2

Editor: Floor Anthoni, Medical Biological Laboratory TNO, Rijswijk, The Netherlands

This volume adds 44 new subroutines to the gradually increasing PDP-8 subroutine library.

Source Language: PAL III, PAL-D, PAL-8

DECUS NO. 8-603

PATPST: Patch for DEC-LAB-8/E Post-Stimulus-Time-Histogram Program

Priv. Doz. Dr. med. Juergen B. Vieth, Universitaets-Nervenklinik, Erlangen, W. Germany

This is a patch for the DEC-LB-U4OB Post-Stimulus-Time-Histogram-Program. It allows to write or read data on DEC-tape unit 3 while the program is called from the system device (unit 0). Questions about the functions "write" or "read" as well as the desired file number will be asked on the display. During function "write" all TTY commands of the main program are active. During "read" function commands to reask parameters or to clear the data buffer are not available.

Minimum Hardware: PDP-8/E with 4K memory, ASR33 teletype, AD8-EA 10 bit A/D converter, AM8-EA 8 channel multiplexer, VC8-E Point plot display control with display oscilloscope VR03A or VR 14 or RM 503, DK8-EP Programmable real time clock, KE8-E Extended arithmetic element, TC08 DECtape control, TU 56 Dual DECtape transport
Other Programs Needed: Main program (DEC-LB-U4OB)
Storage Requirement: Core locations: 0-4177, 7420-7577 (For further information: DEC-LB-U4OB-D); this patch runs in the data area: 4200-6177
Restrictions: The name of the program must be: PST
Source Language: PAL-D

DECUS NO. 8-604

'GET' Command for the Disk/DECtape Monitor System

Craig B. Phyfe, The Hill School, Pottstown, Pennsylvania

This is a program developed for use with the Disk Monitor System. It has been used successfully on the 'AF' version of the monitor, but it should run on the '8E' version as well. The program is an extension of the Disk Monitor System, allowing the user to read a specified file from the disk into core without executing it. It is patterned after the OS/8 system 'GET' command, with the restriction that this program will only manipulate programs saved on the system device, whether it be DF/DS-32 disk, RF/RS-08 disk, or DECtape. This program

DECUS NO. 8-604 (Continued)

is useful when the user wants to toggle a patch into a system program before executing that program.

Minimum Hardware:	4K PDP-8, DF32 Disk or RF08 Disk or TC01 DECtape
Other Programs Needed:	Disk Monitor System (DEC-08-SBAF-PB)
Restrictions:	Actual system will recognize both Disk and DECtape but GETSYS will only operate on the system device.
Source Language:	PAL-D

DECUS NO. 8-605

ADUMP8

Bruno Nicoletta and G. Franco Ruffini, Digital Electronic Automation, Moncalieri, Italy

This program provides a means of punching information contained in selected blocks of any core memory field, as binary coded paper tape using the high speed or TTY punch.

Minimum Hardware:	4K PDP-8, TTY or high speed punch
Source Language:	PAL III

DECUS NO. 8-606

PIP11

Steven Williamson, Carleton College, Northfield, Minnesota

PIP11 allows a PS/8 user to read and write on DECtapes formatted and initialized for either DOS or RSTS, the two most commonly used systems on the PDP-11. Additional options allowing the output of data from an 11 DECtape to a DECtape that can be used by TSS/8 BASIC are also available.

Minimum Hardware:	8K PDP-8, EAE, 1 DECtape drive (2 preferable)
Other Programs Needed:	PS/8 system
Source Language:	PAL-8

DECUS NO. 8-607

CALCU1

J. V. Hopson, Bureau of Customs, 2100 K Street N. W., Washington, D. C.

Makes the PDP-8 perform like a printing calculator, with addition, subtraction, multiplication, division, and exponentiation. Prints out subtotals and totals on command. Recognizes control/C for return to monitor. Utilizes one of the DEC floating point packages (EAE--if so equipped, NON-EAE, or 27-BIT). Introductory dialog gives essential operating instructions.

Minimum Hardware:	PDP-8, TTY
Other Programs Needed:	Floating Point Package (EAE, NON-EAE or 27- BIT)
Source Language:	PAL-8

DECUS NO. 8-608

FUTIL - OS/8 File Utility

Jim Crapuchettes, Department of Anesthesis, Stanford Medical Center, and Frelan Associates, Menlo Park, California

This program allows examination and modification of OS/8 (PS/8) mass storage devices from the teletype. A wide variety of commands allows this to occur along with searching, file look-up, and 24-bit integer expression evaluation.

Minimum Hardware:	OS/8 Configuration, 8K
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-609

OCOMP - Octal Compare and Dump

Dennis McGhie and Jim Crapuchettes, Frelan Associates, Menlo Park, California

An OS/8 utility program to compare or dump OS/8 files. Masking for compares and searching for dumps are included. The output file contains the contents in octal from the first input file, of all (dump) or part of the words (compare, search) from the file. This program is useful for comparing two versions of a ".SV" file.

Minimum Hardware:	OS/8 Configuration (Source file is supplied on DECtape)
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-610

INVENT-8

Charles Moeder, Digital Equipment Corporation, Maynard, Massachusetts

INVENT-8 is a series of subroutines for manipulating binary unformatted data running under the OS/8 Monitor (OS/8 FORTRAN II). It allows the user to open input and output files as well as read and write binary unformatted, fixed length records of up to 125 12-bit word per record.

Also included is a generalized sort generator for sorting these core image records.

Minimum Hardware:	OS/8 Configuration, 8K, 64K Mass storage peripheral
Other Programs Needed:	OS/8 FORTRAN
Source Language:	SABR

DECUS NO. 8-611

SLED - Source and Listing Editor

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

Programs written in condensed format (with lines separated by semicolons and extended as required) do not give neat listings, suitable for publication, when passed through the standard MACRO or PAL III assemblers. SLED secures a neat listing from the raw listing tape produced from the assembler, with one blank line before each label, except labels used to define zero constants, and two blank lines before every break in program counter sequence. Along each line, non-significant spaces are eliminated to give a nicely justified format, and the obtrusive semicolons are removed. The number of lines to a page are controlled and new pages automatically started at suitable points in the listing. Pagination and titling are automatic. The program can be used to lay out source tapes in a similar manner.

Minimum Hardware:	PDP-8, TTY, HSR and/or HSP optional
Restrictions:	Program written for non-standard high speed paper tape reader - use standard DEC reader with caution. One delay needs adjustment for computer other than 8/S
Source Language:	MACRO

DECUS NO. 8-612

ELAN - Elementary Linguistic Analysis

W. D. Gilmour, Coxbridge House, Coxbridge, Glastonbury, Somerset, England

ELAN is a simple program for educational demonstrations of the use of a computer in language studies. From an input of arbitrary length it counts the occurrence of every letter, punctuation mark, and other symbol in the sample, and also can be set to count the occurrences of up to 64 nominated words, or the beginnings or endings of words, each with a maximum length of 7 characters, and to present all these counts in a convenient format at the end of the sample, together with a word length analysis and a count of the number of paragraphs in the sample. Input can be by paper tape, using either a teletype of HSR, or directly from the keyboard.

Minimum Hardware:	PDP-8, TTY, HSR optional
Restrictions:	Developed for non-standard HSR; use DEC HSR with caution
Source Language:	MACRO

DECUS NO. 8-613

Interconversion Between A/D Floating Point and D/A Formats

Brian C. Hodgkin, Ph.D., Maine Medical Center, Portland, Maine

A collection of subroutines is provided which makes possible the conversion of data in one format to either of the other two formats. Complex calculations can be performed on A/D inputted information using floating point arithmetic, with results outputted in any of the three formats. Machine language and floating point programs can be intermingled by appropriate initialization and use of the subroutines.

Minimum Hardware:	PDP-8, A/D and/or D/A converter
Other Programs Needed:	23-bit Floating Point Package (DEC-08-NFPPA-A-PB)
Restrictions:	Can be used in single field as is; can be modified for multi-field operation. A/D and D/A formats must be the same as ADØ1A and AA50
Source Language:	PAL III

DECUS NO. 8-614

Clock Calibration

Masashi Kamii, The Central Institute for Experimental Animals, Nogawa, Kowasaki, Japan

Using CRT (RM503) and X'TAL-clock in an AX08 configuration this program allows visible calibration of the RC-clock.

Minimum Hardware:	LAB 8/I (PDP-8/I and AX08 without XR, XC, XM option)
Source Language:	PAL III

DECUS NO. 8-615

EAE Multiplication for 8K FORTRAN

Donald C. Parker, Clarkson College of Technology, Potsdam, New York

This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/I or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.RL. Core space, however, has been sacrificed for this additional speed.

Other Programs Needed:	8K FORTRAN
Source Language:	SABR

DECUS NO. 8-616

Octal Character Equivalent

David Dodell and Michael Wax, Dix Hills, New York

This program will find the 8-bit ASCII code equivalent for any letter or symbol typed, with the exception of CTRL C. It will run only under the TSS/8 monitor, but can be easily converted for a stand-alone PDP-8.

Minimum Hardware:	TSS/8
Source Language:	PAL-D

DECUS NO. 8-617

V.A. PKS.-1 and V.A. PKS.-2, Real Time G. C. Data Integrator and G. C. Data Manipulator

Dr. J. B. Pearce, Ball Brothers Research Corporation, Boulder, Colorado; Dr. S. P. Levine, Veterans Administration Hospital, Denver, Colorado; P. J. R. Boyle, University of Colorado, Denver, Colorado; J. L. Naylor, Veterans Administration Hospital, Denver, Colorado

V.A. PKS.-1

GC separation and integration is accomplished by an assembly language program which makes extensive use of the floating point arithmetic interpreter. The real time portion of the program samples data from the GC detector once per second. This data is smoothed and differentiated using a weighted, odd integer smoothing routine. When the derivative exceeds an operator selected value, a "GC peak" is provisionally established. If the peak satisfies the selected minimum width criterion, the location and area of this event are either printed out immediately on the teletypewriter or stored in memory for further processing if there is evidence that the peak is incompletely resolved. When the GC data returns to within a selectable vicinity of the baseline, or five peaks is exceeded, the perpendicular drop method is used to resolve them and the results are printed out.

V.A. PKS.-2

Automatic data reduction is as important as peak area integration. Reduction of the data is accomplished using the same equipment in an off-line mode. This segment of the program accepts the paper tapes generated by the first segment, as well as additional information from the keyboard. This program also uses the floating point interpreter. The interpreter remains resident in core and only the driving segments of the program need be exchanged.

Minimum Hardware:	4K PDP-8, 189 A/D, ASR33, KW08 or R401 clock packages, Computer-compatible GC
Other Programs Needed:	Floating Point Processor (DEC-08-YQ2B-PB)
Miscellaneous:	This program has also been modified for use on the PDP-12. Information may be obtained from: Tom Jenkins, Mass. Spectrometry Laboratory, Cold Regions Research Laboratory, Hanover, N. H.
Source Language:	PAL-8

DECUS NO. 8-618

Two OS/8 Device Handlers for the 57A Magnetic Tape Control

Donald C. Uber, Lawrence Livermore Laboratory, University of California, Livermore, California

Three programs are included. MTA is a one-page file-structured OS/8 handler using the "simulated DECtape" format of DECUS NO. 8-391. TAP is a two-page non file-structured handler for ASCII files. Both require EAE and run on a 57A magtape controller with two transports. MARK is a stand-alone program for formatting MTA tapes. The write-up includes listings and describes several modifications to the 57A necessary to run the software.

Minimum Hardware:	8K PDP-8, DEC 57A Magtape Control with 1 or 2 tape units
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-619

FORTRAN-Callable Scope Subroutines for the KV8/VTØ1 Graphic System

Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of 10 subroutines for an 8K FORTRAN system (OS/8, PS/8, or paper tape) which allows any FORTRAN or SABR program to display graphical figures or text on a VTØ1 storage tube. Provision is provided for erasing the screen, turning on or off the cursor, testing the cursor flag, reading cursor coordinates, and drawing points, lines and circular arcs. Text strings may also be displayed anywhere on the screen with characters of arbitrary width, height and orientation. Any of the 64 printable ANSCII characters may be drawn. Core required is 8 pages.

Minimum Hardware:	KV8 Controller, VTØ1 Storage tube, H3Ø6 Joystick
Other Programs Needed:	SABR Assembler; Linking Loader; FORT.LIBRAR.
Source Language:	SABR

DECUS NO. 8-620

The PHA-8 Data Acquisition System

Digital Equipment Corporation Physics Marketing
Submitted by: R. J. Epler, LDP Marketing, Digital Equipment Corporation, Maynard, Massachusetts

Five programs are offered which produce a powerful system for the acquisition and analysis of nuclear physics data, made possible by the interfacing of an analog-to-digital converter (ADC) to a DEC PDP-8 family computer.

All programs will run on the PDP-8/L or 8/I. None will run on the PDP-8/S. All programs require the KA8E peripheral. Other necessary peripherals are:

NN01 Nuclear ADC Interface and Scope Control (available from DEC 's Computer Special Systems.)

DECUS NO. 8-620 (Continued)

Tektronix 503 Scope
Any Wilkinson type PHA ADC
TCØ8 DECtape if available

Source Language: PAL-1Ø and PAL-8 for all routines

Note: Only an introduction to the system is offered under this initial number. The various routines and associated documentation should be ordered by the numbers indicated below.

DECUS NO. 8-620A

SINGS - Single Parameter, Single Precision, 1024 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 1024-channel pulse height spectra into two data regions. The count capacity is 4096 counts per channel. The program receives and executes commands from the Teletype Keyboard. These commands start and stop data acquisition, determine the data area, display the area with markers, expand regions of interest on the scope, integrate (sum) the data between markers, print and punch out the data, output the data to DECtape and subtract data regions.

Other Programs Needed: PK8L (8-620C) and SINGDP (8-620B)

Storage Requirement: 4K

DECUS NO. 8-620B

SINGDP - Single Parameter, Double Precision, 1024 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 1024 channel double precision pulse height spectra. The count capacity is 16,777,216 counts per channel. The program receives and executes commands from the Teletype Keyboard. The commands start and stop data acquisition, display the data with markers, expand the regions of interest on the scope, integrate (sum) the data between the markers, print and punch out data, and output data to DECtape.

Other Programs Needed: PK8L (8-620C) and SINGS (8-620A)

Storage Requirement: 4K

DECUS NO. 8-620C

PK8L - 1024 Channel Off-Line Peak Location and Listing

This program provides an off-line peak location and listing capability for the 1024-channel data acquired by SINGS and SINGDP. The program continuously interrogates the switch register and interprets the contents as commands. The program can set a window of variable width on the display, rotate the spectrum past this window, print the channel number of the bright dot indicating the center of the window, display the channel number of the bright dot, print the peak centroid, store the centroid in a list of known calibration peaks, store the centroid in a list of unknown peaks, list the calibration peaks and list the unknown peaks.

Other Programs Needed: SINGS (8-620A) and SINGDP (8-620B)

Storage Requirement: 4K

DECUS NO. 8-620D

SING8K - Single Parameter Precision and One-Half, 4096 Channel, PHA Data Acquisition and Display

This program acquires and analyzes 4096 channel pulse height spectra. The count capacity is 262,144 counts per channel. The program receives and executes commands from the Teletype Keyboard. These commands start and stop data acquisitions, display the data with markers, expand regions of interest on the scope, integrate (sum) the data between markers, type and punch out data, and output data to DECtape.

Other Programs Needed: PK8K (8-620E)
Storage Requirement: 8K

DECUS NO. 8-620E

PK8K - 4096 Channel Off-Line Peak Location and Listing

This program provides an off-line peak location and listing capability for the 4096 channel data acquired by SING8K. The program continuously interrogates the switch register and interprets the contents as commands. The program can set a window of variable width on the display, rotate the spectrum past this window, print the channel number of the bright dot indicating the center of the window, display the channel number of the bright dot, find the centroid of the peak indicated by the bright dot, print the peak centroid, store the centroid in a list of either known or unknown peaks, and list either the known or unknown peaks.

Other Programs Needed: SING8K (8-620D)
Storage Requirement: 8K

DECUS NO. 8-621

Gray Code Conversion Package

Garth Peterson, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, South Dakota

Gray Code Conversion Package contains one subroutine for converting from binary to Gray code and three subroutines for converting Gray code to binary. The three Gray-to-binary subroutines provide a trade-off between speed and core usage.

Source Language: PAL-D

DECUS NO. 8-622

KV8/I - VTØ1 Device Handler

Erik Seliak, Dept. of Information Science, University of Melbourne, Parkville, Victoria, Australia

This is a handler for the VT01 storage display with the KV8/I-VS8E vector generator. It uses the DEC supplied Variable Stroke Character Generator routine and includes character size setting, and clear screen commands which may be entered via the teletype. When the screen is full the handler waits for any character to be typed before clearing the screen and continuing. Because the handler does not fit into two pages part of it is swapped in and out when the handler is called, but the system sees only a two page handler.

Minimum Hardware: PS/8 or OS/8, KV8/I-VTØ1 or VS8E
Source Language: PAL-8

DECUS NO. 8-623

PAGER

Kevin Willoughby, Attleboro High School, Attleboro, Massachusetts

PAGER reads a symbolic tape and formats it, expanding tabs and paging as necessary. Unlike previous programs of this type (DECUS NO's 184 and 356), PAGER will handle both source and third pass tapes, supply any desired heading to each page, and has no operating restrictions.

Source Language: MACRO8 (PAL-D compatible)

DECUS NO. 8-624

DUMP and LOAD, TSS/8

David Wolfe, Carleton College, Northfield, Minnesota

This pair of programs provides a backup of TSS/8 (Edusystem 50) disk files on DECtape. Several options allow for flexible dumping and loading. All dumping and loading is done with the timesharing system running.

Minimum Hardware: PDP-8 with a minimum of one DECtape drive
Other Programs Needed: TSS/8 (Edusystem 50)
Source Language: PAL

DECUS NO. 8-625

Floating Integer Functions for use with 8K FORTRAN

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Supplies the FORTRAN programmer with floating integer functions similar to those available in FOCAL or BASIC. The three functions offered here operate on a floating ("real") argument and return a floating ("real") integer. No change mode takes place, and the programmer is not limited to arguments less than 2048.0.

Minimum Hardware: Paper tape system or PS/8-OS/8
Other Programs Needed: Linking Loader, FORTRAN (8K) Library
Source Language: SABR

DECUS NO. 8-626

Automated Electrooculography

Paul R. Hudak
Submitted by: Dr. John R. Bourne, Vanderbilt University, Nashville, Tennessee

A real-time program is described which, with the aid of some simple external circuitry, can be used as an automated clinical system for measuring a patient's electrooculogram (EOG) during periods of light and dark adaptation. Such clinical electrooculography is an aid in testing retinal function, but has previously been a time consuming task. A LAB 8/e computer with the standard A/D converter and Schmitt trigger interfaces and a minimum of 4K of memory are all that is necessary for proper operation. Reference should be made to an article, "Computer Automated Electrooculography," which appeared in Computers and Biomedical Research, Volume 5, pp. 654-658, 1972

Source Language: PAL III

DECUS NO. 8-627

TEXPAK - Program to Convert a Line of Text to Packed Octal Format

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The program accepts a line of typed text and prints out the simple 6-bit stripped octal equivalent that would be generated by the "text" pseudo-op in higher-level assemblers such as MACRO. Simple editing facilities are provided.

Source Language: PAL III

DECUS NO. 8-628

LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8)

Larry Davis, Washington University and Torbjorn Alm, Autocode AB
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Modified version of DECUS NO. 8-102A for use under OS/8 (PS/8). OS/8 file input and output is allowed, which enables the user to prepare LISP programs using OS/8 EDIT. Input and output in ASCII. Facilities for writing own code in assembler to be added to the interpreter for evaluation of apecial functions are provided for.

Minimum Hardware: PS/8 Configuration
Other Programs Needed: PS/8-OS/8 Operating System
Storage Requirement: 8K
Source Language: PAL-8

DECUS NO. 8-629

Graphing Subroutines for 8K FORTRAN Programs

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This program is offered because while graphing is perhaps more naturally done with interpretive languages such as FOCAL or BASIC, there are times when one wishes to do a graph of some sort as part of a FORTRAN program. Unfortunately, the inflexibility of a FORTRAN "Write" statement makes this a tedious bit of programming. Drawing a graph with an x-axis is even harder, if one wishes the points on curve and axis to be in line.

Minimum Hardware:	PDP-8 with TTY or DECwriter
Other Programs Needed:	Linking Loader, IFIX (FORTRAN Library)
Storage Requirement:	1 page, relocatable
Source Language:	SABR

DECUS NO. 8-630

Pulmonary Function Laboratory Programs

Richard H. Earle, M.D. and Dario B. Domizi, M.D., Biomedical Computer Facilities, The University of Chicago, Chicago, Illinois
Submitted by: Ronald C. Carter, Digital Equipment Corporation, Maynard, Massachusetts

The pulmonary testing software developed at the University of Chicago's Biomedical Computation Facilities is designed to operate on four (4) hardware configurations of the LAB-8/e system.

All tests are adapted for use with a pneumotachograph and the appropriate gas analyzers required for each test. The software is designed to automate the testing procedure and calculations of the following measurements: lung volumes, flow rates, open circuit nitrogen washout and single breath diffusing capacity. The DECtape oriented systems enable the user to store patient data on DECtape for later recall.

LAB-8/E Configuration	Order DECUS No.
4K Paper Tape System	8-630A (Spirometry Only)
8K Paper Tape System	8-630B
8K TD8-E/TU56	8-630C (For non-ROM systems request binary paper tape loader in addition to DTA)
8K TC08/TU56	8-630D
OS/8 DECtape systems	8-630E (Contains binaries and sources for 4K and 8K paper tape systems)

(See applicable Service Charge list for material available.)

Minimum Hardware:	Specific hardware requirements for each system/application can be found in document
Source Language:	PAL-8

DECUS NO. 8-631

MINT - Multiple Precision Integer Arithmetic Subroutine

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Arithmetic and input-output subroutines are provided for multiple precision integers.

Minimum Hardware:	PS/8, OS/8, OS/12
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 8-632

RWDF32

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

This FORTRAN and SABR callable program allows blocked input and output from DF32 disks where the block size is a parameter.

Minimum Hardware:	PS/8, OS/8, OS/12; DF32 disk
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 8-633

MAC8, 8K MACRO ASSEMBLER

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MAC8 is an 8K assembler which runs under PS/8, OS/8 or OS/12. It allows macros to be written along with other assembly language instructions.

Minimum Hardware:	PS/8, OS/8, OS/12
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-634

MOVE

Larry Davis, Carl Ralston, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MOVE is an OS/8 program for transferring files from one directory device to another directory device. It is efficient since it reads the input and output device directories only once.

DECUS NO 8-634 (Continued)

Minimum Hardware:	OS/8, OS/12 configuration
Other Programs Needed:	OS/8 or OS/12, Version 1 (May work with OS/8, V2)
Storage Requirement:	8K
Miscellaneous:	Changes given in document to make MOVE work with PS/8
Source Language:	PAL-8

DECUS NO. 8-635

PAL12D

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

PAL12D (Davis) is a modification of the PAL8 Assembler to allow either PDP-8 or LINC mnemonics.

Minimum Hardware:	PS/8, OS/8, OS/12 configuration
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-636

BEST - Binary to Symbolic Traductor

Michel Morel and Francoise Landre
Submitted by: J. A. Gaudron, E.N.S.E.E.C., Caen, France

The Binary to Symbolic Traductor accepts a paper tape in a binary format, and produces either a printed listing or a paper tape in ASCII format, acceptable to the PAL III Assembler. It can disassemble 8K programs, with interrupts and FPP instructions. It sorts out instructions from constants, and automatically produces tags at the referenced addresses, which helps the operator to understand quickly any program. The operator can converse with BEST, indicate various starting addresses, and options for outputs (Automatic paging, Pass 3 listing).

Minimum Hardware:	8K PDP-8; ASR33; High speed reader
Source Language:	PAL III

DECUS NO. 8-637

A Flexible Data Buffer Display Routine for LAB-8 Systems

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This set of five subroutines may be called to display the contents of a data buffer on the oscilloscope of an AXØ8 (LAB-8) system. Software control of format as either a point or a histogram display, vertical scaling and placement in the two axes of the display is provided.

Minimum Hardware:	LAB-8 System with RM5Ø3 Display
Other Programs Needed:	User supplied subroutine to reset parameters as detailed in write-up
Storage Requirement:	162_8 locations on one page
Source Language:	PAL III

DECUS NO. 8-638

GEOMAS

Dr. Peter Duncan, University of Puerto Rico, Department of Marine Services, Mayaguez, Puerto Rico

The program GEOMAS, developed for the SEAMAP program of the University of Puerto Rico, calculates

(i) Great circle distance between two oceanographic stations

(ii) The mean latitude between the stations

(iii) The coriolis parameter for the mean latitude

(iv) Geostrophic velocities relative to a depth chosen by the operator or to the greatest depth common to both stations

(v) Geostrophic volume transports between given depths (by trapezoidal interpolation) and the total transport between the surface and the reference depth.

A description of the format and manner in which the input depths and dynamic heights are entered, is contained on comment cards in the program.

Minimum Hardware:	OS/8, 12K, TD8E
Source Language:	FORTRAN II

DECUS NO. 8-639

OS/8 DISASM

John E. Curtis, Curtis Institute, East Moriches, New York

OS/8 DISASM is a disassembler for the conversion of aboslute binary files into listings or source files under OS/8. Symbol table definition features permit the reconstruction of literals, direct off-page references, address and data tables, and the insertion of suppressed origins for overlays. DISASM is designed for multi-field programs. Symbols are defined by field and only current field labels are output as labels and direct addresses. Listing organization is designed for ease of interpretation. Source output is designed to imitate programs written by experienced programmers. SPLIT, a program to split large binary files into many small files for easy disassembly, is included.

Minimum Hardware:	8K OS/8 System
Source Language:	PAL-8

DECUS NO. 8-640

OS/8 EDIT PLUS

John E. Curtis, Curtis Institute, East Moriches, New York

EDIT PLUS is an editor for OS/8 designed for the full ASCII character set. It will accept and store all codes from 200 to 377 except those used for control characters. It also has two additional search features. Stream searches permit the merging of lines and complete revision of line boundaries. Inter-buffer dump searches permit the extraction of selected entries via searches. EDIT PLUS permits the input and output file lists to be altered during operation. The rubout and line-feed-repeat features of the OS/8 Monitor are used.

Minimum Hardware: 8K OS/8 System
Restrictions: EDIT PLUS does not recognize the ESC 3 and ESC 4 codes used by the Model 38 for ribbon color changes. These may cause tabulation errors. The special routine required is small, but the table changes required would mean complete reorganization of many pages. On the author's system both OS/8 EDIT and EDIT PLUS sometimes print two spurious characters on return to command mode.
Source Language: PAL-8

DECUS NO. 8-641

OS/8 FORMAT

John E. Curtis, Curtis Institute, East Moriches, New York

FORMAT is supplied as a PAL-8 source tape for easy modification to conform to the user's system. It is written for a system with no line printer and uses the device name LPT and device code 4. Designed for Model 33 and 38 Teletypes with 8 1/2 friction feed options, it can be modified for other terminals. Its tables are set for PAL-8 listings and general PIP dumps of ASCII files.

FORMAT offers the following controls:

1. Individually set tabulation positions.

2. Pagination of output. A switch register option permits inserting a halt between pages for paper changer, etc.

3. Right margin limit to suppress pile-up and Model 38 automatic carriage returns.

4. Left margin control as a switch register option.

5. Vertical tabulation, a set number of lines advance.

6. Model 38 ribbon change commands do not alter tabulation.

Minimum Hardware: OS/8 System, Model 33 or 38 TTY
Source Language: PAL-8

DECUS NO. 8-642

AUTOCO - Autocorrelation for Poor People (Without EAE)

Theodore J. Glattke, Stanford University School of Medicine, Stanford, California

The program obtains an autocorrelation function on a string of data up to 512_{10} points by computing a Pearson product-moment correlation coefficient between elements in the string and those elements "delayed" with respect to themselves. It is particularly useful in extracting periodic components from EEG and similar data; and for providing precise indices of their temporal cadence.

Minimum Hardware: PDP-8 or PDP-8/I with DECtapes and Oscilloscope display control, such as VC8/I or 34D
Source Language: XPAL

DECUS NO. 8-643

LIFE

Philip Corman, Stewart Radiance Laboratory, Bedford, Massachusetts

An OS/8 version of Conway's game "LIFE" as published in several Scientific American articles. The universe consists of a 32 X 32 matrix. Births and deaths are computed according to the number of nearest neighbors.

Minimum Hardware: 8K PDP-8/E
Other Programs Needed: OS/8
Source Language: 8K FORTRAN - OS/8

DECUS NO. 8-644

MINMON - TD8E DECtape Minimonitor

Ian H. Witten, Department of Electrical Engineering Science, University of Essex, United Kingdom

The TD8E Minimonitor enables 4K core images to be stored on DECtape and loaded when required. The monitor comprises:

a) A command decoder and DECtape read routine, normally occupying core locations 7600-7777;

b) a modified version of the BIN loader, a 200 word routine capable of being executed in any core page;

c) a DECtape write routine, a 200 word routine capable of being executed in any core page.

Minimum Hardware: 4K PDP-8/E, M or F, TD8EM and single TU56 DECtape drive
Restrictions: The TD8E minimonitor is incompatible with the OS8 DECtape file structure
Source Language: PAL III

DECUS NO. 8-645

Interfacing the PDP-8 to the Printec-100 Line Printer

H. E. Cronin, Naval Weapons Center, China Lake, California

Circuit and design considerations for interfacing the PDP-8 computer and a Printec-100 line printer. Three patches convert the TTY instructions in "FOCAL" and "EDU-10 BASIC" and "FORTRAN" to output to the line printer. An assembly language program to printout all the alphabetic and numeric characters for testing purposes is included as well as an overlay for FOCAL which uses a "P" command to cause either the teletype or the line printer to be used for output, according to the setting of a switch on the switch register.

Minimum Hardware:	PDP-8, TTY and Printec-100 Line Printer
Restrictions:	Does not use "interrupt" system
Source Language:	PAL

DECUS NO. 8-646

DECsystem-8

John R. Covert and Douglas E. Wrege, The Georgia Institute of Technology, Atlanta, Georgia

This package adds many of the PDP-10 operating system features to the PS/8 system, including the capability of further expansion of the monitor command set, the LOGON and KJOB (kill job) commands, and the compile command for shorthand calls to the standard language processors on the system. The philosophy of the additions to the system was to keep as much compatibility between the PDP-10 operating system and the PS/8 system as possible. In some cases, the command syntaxes used are not optimum, but are PDP-10 compatible. Users who use both the PDP-10 and the PS/8 systems on a day-by-day basis will be able to converse with both systems with a minimum of consideration of the differences in command syntaxes.

Minimum Hardware:	Standard OS/8 configuration
Other Programs Needed:	PS/8 or OS/8
Source Language:	PAL

DECUS NO. 8-647

FULMIX - Complete Permutation Program

Bradford Needham, South Salem High School, Salem, Oregon

Prints all the unique permutations of a given set of units, using the minimum amount of paper (limit of 32 decimal units, but can be easily increased). These units may be any number of characters, and any number of units may be alike.

Minimum Hardware:	PDP-8/L, TTY
Source Language:	Machine Language

DECUS NO. 8-648

LOGMIN - Logic Minimization Program

David Wu, Princeton University, Princeton, New Jersey

LOGMIN is useful to the logic designer for determining or checking the two-level minimized representation of a logic function, given that function in its sum-of-products or product-of-sums form. The function need not be in its canonical representation.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	PAL-8

DECUS NO. 8-649

QPIP - OS/8 Directory Editing Program

B. D. Monahan, Standard Telecommunication Laboratories, Ltd., Harlow, Essex, England

Provides a few file management facilities not available with OS/8 PIP. These are:

1. Deleting files undeletable by PIP
2. Reserving space on a directory device
3. Changing names of files without having to transfer their contents
4. Handling inquiries for device information

To do this the program incorporates its own command decoder, with syntax identical to the usual one, but allowing any characters except " @ " in device names, file names and extensions.

Minimum Hardware:	BASIC OS/8 System
Storage Requirement:	8K
Restrictions:	Will not currently run under OS/8 BATCH monitor
Source Language:	PAL-8

DECUS NO. 8-650

AMIPED - Automated Medical Interview With Pediatric Data Files

David C. Mauger, University of Auckland, Auckland Hospital, Auckland, New Zealand

This program is designed to administer a series of questions in an interactive, branching manner to record and print a summary of the answers, and to generate a file of these for later reference.

The questions supplied are of a pediatric medical nature, and are intended to relieve the doctor of personally eliciting some of the repetitious and standardized parts of the pediatric history, but the programs could administer, without change, any series of questions. Questions need not be medical.

Minimum Hardware:	OS/8 Configuration
Storage Requirement:	8K
Source Language:	OS/8 BASIC

DECUS NO. 8-651

SOLMT (Sort Overlay Listings Using Magnetic Tape)

K. G. Jones
Submitted by: G. E. Collins, Vickers Limited Medical Engineering, Basingstoke, Hampshire, England

This program can be used to produce a composite listing of a PAL-8 program which has been built from a number of overlay programs. Input and output are on DECtape.

Minimum Hardware:	8K PDP-8, 2 DECtapes, High Speed Paper Tape Reader
Other Programs Needed:	PS/8
Restrictions:	Does not use command decoder in OS/8
Source Language:	PAL-8

DECUS NO. 8-652

Regression Analysis Package

Theodore E. Bridge, 54 Williamsburg Drive, Springfield, Massachusetts

This package is a group of programs for making a multiple regression with up to 3 independent variables, and up to 28 degrees of freedom. We assume that a dependent variable (W) may be represented by a polynomial function of independent variables (X, Y, Z). We enter data for many points, and ask the computer to find the coefficients for a least squares fit. Provision is made for dumping the coefficients to tape, and reloading in a new location.

Minimum Hardware:	4K PDP-8/F
Other Programs Needed:	3 page floating point package
Source Language:	PAL

DECUS NO. 8-653

MTAPER - 8K Magtape Monitor (TRØ5-A Interface) and 8K FORTRAN I/O

Robert F. Thomas, Boston College, Chestnut Hill, Massachusetts

The Tape Monitor provides the facility to control an industry compatible 9 track 800 bpi magnetic tape unit interfaced with a TR05-A Interface. The monitor responds to four commands from the keyboard: STORE, EXECUTE, DELETE, and LIST.

A complete set of library programs is also provided to allow I/O through the 8K FORTRAN, SABR and LINKING LOADER system. All usual utilities plus fully formatted I/O can be performed. The magtape drive can be programmed like any other formatted device.

Minimum Hardware:	8K PDP-8, TRØ5-A 9 track 800 BPI Magtape, ASR33
Other Programs Needed:	Paper Tape Operating System
Source Language:	PAL III, SABR

DECUS NO. 8-654

Cabrillo Test Grader

Don Singer, Forest Gove Union High School, Forest Grove, Oregon
Submitted by: Cabrillo Computer Center, Lompoc, California

This is an assembly language version of DEC's Edutest Test Grading Program. It uses standard Edutest cards and is more efficient and foolproof than Edutest. It produces an optional individual student printout with either right or wrong questions listed, produces a class list showing # of questions each student answered right and his percentage score, and an item analysis showing how many times each question was missed and the correct answer as read from the key card. It handles 999 students and a maximum of 100 questions.

Minimum Hardware:	4K PDP-8/E with CM8-E optical mark sense card
Source Language:	PAL III

DECUS NO. 8-655

Patches to CINET-BASIC (DECUS NO. 8-159)

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

The first patch replaces the internal 'ALIGN' and 'FIX' routines. The "INT(X)" function is now freed from any restrictions on the size of its argument, X. This patch overlays existing core used by the floating point routines and is invisible to the user. No sacrifice is made by loading it.

The second patch is a compromise. It reenables the "SGN(X)" function but has certain drawbacks which are stated in the documentation.

Restrictions:	SGN uses 7600-7610 which is free in paper tape systems - not in operating system
Source Language:	PAL III

DECUS NO. 8-656

SELFDRILL - The Sloan Selfdrill Program

Francis M. Wheeler, Beloit College, Beloit, Wisconsin

This program converts a PDP-8 with teletype into a general learning school, i.e., the program is totally independent of subject matter. User types a set of cue/response items into core file. Program presents each cue repetitively, at intervals determined by user's response to the particular item, until he is able to type the specified response quickly, accurately and consistently. Includes file edit features, tape read and punchout of drill items, the capability of systematic review, randomized comments, randomized use of learner's name, program-assisted typing with instant feedback and mitigation of non-significant errors during response.

Minimum Hardware:	4K PDP-8, ASR33
Restrictions:	File limited to 1278 characters
Source Language:	PAL III

DECUS NO. 8-657A

INPUT, A Neurophysiological Data Collecting Program

Fred Delcomyn, University of Illinois, Urbana, Illinois

This program, the first of three sets of interrelated routines, will accept up to three channels of pulse input and four channels of analog input via the AXØ8 Laboratory Peripheral. Data consisting of the time interval between the pulse inputs, and the amplitude of the analog inputs (measured at user-specified intervals) are stored in data buffers from which they are written onto a disk via another routine (from the second of the three sets). The data stored on disk may be "translated" by routines contained in the third set into ASCII coded decimal digits for subsequent analysis.

Minimum Hardware:	8K PDP-8, 8/I, LAB-8; AXØ8 Laboratory Peripheral; DF32 Disk
Other Programs Needed:	Disk Monitor System; DSKFIL (DECUS 8-657B); TR (DECUS 8-657C)
Source Language:	PAL-D

DECUS NO. 8-657B

DSKFIL, A File Structured Disk Writing Routine and Helpers

Fred Delcomyn, University of Illinois, Urbana, Illinois

This collection of subroutines sets up a disk file for data, and copies blocks of data from core to disk within the confines of a file-structured organization of the disk. The write-routine allows the data to be written contiguously in a file, yet at different times. A short controlling program is included with the subroutines for stand-alone usage.

Minimum Hardware:	4K PDP-8, 8/I; DF-32 Disk
Other Programs Needed:	Disk Monitor System
Restrictions:	Copies whole pages only to the disk
Source Language:	PAL-D

DECUS NO. 8-657C

TR, Binary to ASCII Translator

Fred Delcomyn, University of Illinois, Urbana, Illinois

The routines and patches in this collection constitute a modification of the System routine PIP (DEC-D8-PDAD-PB 12/30/69) which will allow it to act as a "translator" of single or double precision, signed or unsigned, fixed point binary numbers into ASCII coded decimal numbers. The numbers may be stored in a disk file or punched out on paper tape. The routines are specifically designed to handle data in the format produced by the program INPUT. Any data which follow this format can be translated.

Minimum Hardware:	4K PDP-8, 8/I; DF-32 Disk
Other Programs Needed:	Disk Monitor System; PIP (DEC-D8-PDAD-PB 12/30/69)
Restrictions:	Accepts only disk files as input
Source Language:	PAL-D

DECUS NO. 8-658

Extended Double Precision Interpretive Package

Bruce D. Geelhood, University of Washington, Seattle, Washington

This is a revised and extended version of the double precision interpretive package submitted by Roger Anderson in 1968 (DECUS 8-115a). This package performs double precision signed integer arithmetic operations using specially defined single word memory reference instructions. The package is similar to the Floating Point Package (D IG-8-5-S) but occupies much less core. Only two pages of memory and 15 words on page zero are required. This package performs the arithmetic operations of addition, subtraction, multiplication, and division. It can also jump in the interpretive mode, execute external subroutines, store into core double precision, and perform several non-MRI operate commands. The operate commands enable clearing, branching, negating and exiting. This extended version is superior to its predecessor in that it has complete overflow protection, several operate instructions, and an easy method of adding additional functions. In spite of these extensions the new package occupies the same amount of memory.

Minimum Hardware:	PDP-5 or any PDP-8 family computer
Restrictions:	Source compiled on CDC6400 by PAL6400, a cross-assembler
Source Language:	PAL III

DECUS NO. 8-659

VT05

Lars Palmer, A B Hassle, Molndal, Sweden

This is an OS/8-handler for a fast VT05. This handler will supply the necessary fillers after a CR/LF. It will also allow you to paginate the file on the display; i.e., it will wait after each page (form feed or 20 lines) to allow you to read the display.

Minimum Hardware:	PDP-8/E (only), VT05 at 600 baud or above
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	1 page
Source Language:	PAL-8

DECUS NO. 8-660

STAT

Lars Palmer, A B Hassle, Molndal, Sweden

STAT is a development from statpack, the FOCAL statistical package. Its main differences from other packages are:

1) All routines compensate for missing data. Any observation that is set to 0 will be considered missing and excluded from calculations (but e.g. 1E-10 is a legal entry that will be included).

DECUS NO. 8-660 (Continued)

2) All implement analyses can be done on the data in core thereby saving much input time.

3) In 12K it will take into core a total of 1000 data points divided into maximum 10 columns.

4) The following routines are implemented at present: mean and standard errors, t-tests, regression line, correlation matrix, analysis of variance paired and unpaired, Mann-Whitney U-test, Wilkoxon matched pairs rank test, Spearman rank.

Minimum Hardware:	PDP-8, any F4 system, OS/8
Other Programs Needed:	F4 compiler, write-up for DECUS FOCAL8-266
Storage Requirement:	12K in OS/8
Source Language:	FORTRAN IV

DECUS NO. 8-661

LESQ, General Non-Linear Least Squares

Lars Palmer, A B Hassle, Molndal, Sweden

LESQ implements the Gauss-Newton method for determining the best fit constants to a given non-linear curve.

The theoretical method is well described in the write-up to FOCAL8-72 (the mathematical methods used are the same, but there is no relationship in the programs). The program contains the following features:

a) The function to be used is written as a FORTRAN function and added to the system.

b) All derivatives needed are calculated numerically.

c) The program will accept up to 6 constants and up to 30 data points.

d) The program calculates the error matrix for all the constants and outputs a table of calculated y values versus experimental.

e) In an FPP-12 configuration the program iterates most functions in under 10 seconds.

Minimum Hardware:	PDP-8, any F4 system, OS/8
Other Programs Needed:	F4 compiler; write-up to DECUS FOCAL8-72 useful
Storage Requirement:	12K in OS/8
Source Language:	FORTRAN IV

DECUS NO. 8-662

UNDEFSYBLIST - Undefined Symbol List

Roger Geffen, Data Research Associates, Wayland, Massachusetts

This patch, based on the "Alpha List" program by W. F. Haygood, Jr., causes MACRO-8 to list any undefined symbols at the end of pass 1. Space for the patch is made by slightly reducing the size of the HSR buffer.

Other Programs Needed:	MACRO-8
Source Language:	PAL

DECUS NO. 8-663

REPROD - Read, Punch and Verify Product

Robert G. Weiss, Concord College, Athens, West Virginia

REPROD is effective for smaller installations where a wide range of attachments are not available for reliable paper tape duplication. This program reads the paper tape from the LSR of TTY #2 (assigned device code $4\emptyset_8$, which may be easily reassigned by a simple patch). The tape is then punched on the primary teletype (TTY #1) and passed through the LSR on the same TTY for verification from a buffer. This provides one physical pass reproduction with verification.

Minimum Hardware:	4K PDP-8, 8/I, or 8/E; two teletypes (ASR 33) in configuration with related hardware
Other Programs Needed:	Binary loader (loading only), any version meeting standard format
Storage Requirement:	$2\emptyset\emptyset_8$-577_8 (including I/O buffer, or any two consecutive pages by minor modifications)
Source Language:	PAL-III

DECUS NO. 8-664

FREQHS - A Subroutine to Generate a Frequency Histogram From Stored Interval Measurements

A. J. Swan, Agricultural Research Council's PoultryResearch Centre, Edinburgh, Scotland

It is often useful to reconstruct the frequency of events from stored data on the inter-event intervals. A subroutine has been developed to perform this task. Applications have been found in determining variations in unit neuron firing rates and in heart rate determinations.

Minimum Hardware:	Any PDP-8 configuration
Storage Requirement:	110_8 locations on any page
Restrictions:	The intervals should be non-zero
Source Language:	PAL III

DECUS NO. 8-665

INTVAL - A Subroutine to Measure Inter-Event Intervals

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This subroutine may be called to measure the time interval between events with a specified degree of accuracy. Intervals are stored as non-zero, single precision, unsigned integers. This is an efficient way to code activity information since histograms can easily be generated to allow examination of the activity later.

Minimum Hardware:	Any Lab 8 configuration
Storage Requirement:	3 locations on page zero and 107_8 locations on any other page
Restrictions:	All device flags must be cleared before call
Source Language:	PAL III

DECUS NO. 8-666

NORDER - A Subroutine to Generate nth Order Histograms from Inter-Event Intervals

A. J. Swan, Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland

This subroutine may be called to generate nth order histograms from stored inter-event intervals. The main advantages are that only interval measurements need be stored permanently and the order n can be varied to suit the prevailing situation at histogram generation. The main use has been to generate histograms to estimate the nth order probability density functions of the inter-event interval distributions encountered in unit neuronal activity studies.

Minimum Hardware:	PDP-8
Storage Requirement:	120_8 locations on a single page
Restrictions:	Intervals are expected to be non-zero
Source Language:	PAL III

DECUS NO. 8-667

LABLDP - A TSS/8 Tape Labeling Program

Leonard P. Levine, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin

LABLDP is a TSS/8 program to punch a user inputted buffer of characters in block form into the high speed papertape output. Automatic assignment of the high speed punch is done as LABLDP starts. Editing of the user input via rubout commands may be done before the output is punched. The user's account number and the correct date are the first characters punched into the output buffer. This information may be deleted if desired by the user.

Minimum Hardware:	TSS/8, High Speed Punch
Other Programs Needed:	PIP
Source Language:	PAL-D

DECUS NO. 8-668

RAW - A Reverse Assembler of Windsor

P. A. V. Thomas, University of Windsor, Windsor, Ontario Canada

This program was written for a 4K PDP-8 computer to obtain a symbolic program from a binary program produced by the PAL III assembler. The output obtained may be in the standard assembler output format or in a format suitable as input to the assembler for reassembling after modification. The program will handle most of the standard mnemonics including EAE and floating point operations. The only known limitations are (i) a FIELD statement is not acceptable and (ii) subroutines with multiple arguments and/or returns will not give a properly formatted output but will have to be interpretted by the user.

Minimum Hardware:	PDP-8, HSR desirable, TTY
Other Programs Needed:	Binary loader
Storage Requirement:	4K
Restrictions:	FIELD statement not allowed for. Entry to Floating Point Package assumed if instruction JMS I 7 (4407) is contained in program
Source Language:	PAL III

DECUS NO. 8-669

BIOLSD - Antibiotic Assay Using Latin Square Design

J. D. Piguet, Institute of Hygiene, Department of Bacteriology, Geneva, Switzerland

This program computes the potency of an unknown preparation of an antibiotic from the diameters of inhibition given by three dilutions of this preparation and three dilutions of a standard preparation, when the doses are applied in a 6 x 6 Latin square with each dose occurring once in each row and column. When all 36 diameters have been entered through the keyboard or one of the readers, the teletype prints the complete analysis of variance, the potency of the test preparation, expressed as a percentage of the standard preparation, the fiducial limits for $P = 0.95$, and the fiducial interval, expressed as a percentage of the potency.

BIOLSD is available in French or in English.

Minimum Hardware:	4K PDP-8/E, ASR33, high speed reader optional
Other Programs Needed:	27 bit Floating Point Package (DEC-08-NFPEA-A-PB)
Restrictions:	PDP-8/E only
Source Language:	MACRO-8

DECUS NO. 8-670

Basic Plotting Package for OS/8 FORTRAN IV

Jonathan R. Gross, University of Minnesota West Bank, Minneapolis, Minnesota

Basic plotting package including: PLOT (X, Y, IPEN), SYMBOL (X, Y, HGT, BCD, ANGD, N), ASSIGN (X, Y), WHERE (X, Y), FACTOR (FACT), NUMBER (X, Y, HGT, -VAL, ANGD, ND), and program TAB to generate a table of symbols and their values.

Minimum Hardware:	OS/8 PDP-8/E with EAE and XY8E
Other Programs Needed:	FORTRAN IV
Storage Requirement:	5 pages (basic)
Restrictions:	Names conflict with PDP-12 library routines. Uses mode B of EAE
Miscellaneous:	Documentation at beginning of each program source
Source Language:	RALF, FORTRAN IV

DECUS NO. 8-671

Restoring Symbolprint

A. Moses, Applied Math Co., Anthony, Texas

RESTORING SYMBOLPRINT automatically reloads the original contents of locations 10, 11 and 12 which have been destroyed by using Symbolprint after compiling a program in 4K FORTRAN.

Other Programs Needed:	4K FORTRAN Compiler (DEC-08-AFCI)
Storage Requirement:	4K
Source Language:	PAL III

DECUS NO. 8-672

XCBL and XBIN Loader

L. Paul Geffen and Roger Geffen, Data Research Associates, Wayland, Massachusetts

This combination XCBL and XBIN loader selects correct loader automatically. High speed version is offered but instructions are given for use with low-speed reader also.

Minimum Hardware:	PDP-8/E (Should work with other PDP-8s)
Restrictions:	Will not ignore spaces between rubouts as standard BIN will
Source Language:	PAL (Will tab only with MACRO)

DECUS NO. 8-673

Random Number Generators for Use With FORTRAN or SABR Programs

Geoffrey Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

Two 35-bit random generators taken from Knuth's "Semi-numerical Algorithms," adapted to the 27-bit format of the PDP-8 FORTRAN/SABR library. The user can preset the starting point of either sequence by his choice of argument in the calls Y = RAND (X) or Y = RND (X).

Minimum Hardware:	PDP-8 with paper tape or OS/8 - PS/8
Other Programs Needed:	Linking Loader
Storage Requirement:	2 contiguous pages (relocatable)
Restrictions:	7th decimal digit slightly de-randomized
Source Language:	SABR

DECUS NO. 8-674

External - Or RC - Clock (AXØ8) Calibration

Klaus Lickteig, Institut fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

This clock calibration program determines the clock period (milliseconds) or the clock frequency (kH_8) of an external clock or the RC-clock of the AXØ8. The respective period of frequency will be displayed on the oscilloscope of the AXØ8. The program, which can be used as a subroutine, stores the clock period (msec) at location "RCTIME" in the normal DEC Floating Point format. Range of application: 838, 8608 sec = t = 0.03 msec.

Minimum Hardware:	PDP-8, 4K memory, AXØ8, ASR-33 (LAB-8 system)
Other Programs Needed:	DEC-08-YQ2B-PB (Version B only! !)
Source Language:	PAL III

DECUS NO. 8-675

INDUMP - Input Dump

Donna Stevens, New Mexico State University, Las Cruces, New Mexico

This program prints out the content of the input buffer each time external print is received. Bit 11 on the switch register allows the option of printout in binary or octal. It was developed as a programming aid, but is used extensively for design, diagnosis of problems, and repair of research apparatus.

Minimum Hardware:	4K PDP-8/E, external input to buffer, TTY
Restrictions:	Endless loop unless HALT toggled in or manually halted
Source Language:	PAL III

DECUS NO. 8-676

MOVE DELETE

Roger Geffen, Data Research Associates, Wayland, Massachusetts

This patch moves the 'DELETE' routine to the space reserved for the base page literal buffer to make room for other patches in MACRO-8.

Other Programs Needed: DEC-08-CMAB-PB
Source Language: PAL

DECUS NO. 8-677

STAR PIP

David M. Kristol, 462 Green Street, Cambridge, Massachusetts

"STAR PIP" is an extremely useful file utility program for OS/8 that incorporates some of the features of PDP-10 PIP. Foremost of these is the ability to move and delete files with common extensions or names. (STAR PIP is not a modified PIP, but a separate program. PIP functions are NOT duplicated in STAR PIP).

Minimum Hardware: PS/8 or OS/8 System
Storage Requirement: 8K
Source Language: PAL-8

DECUS NO. 8-678

Routine to Expand and Modify the DEC Floating Point Package

Klaus Lickteig, Institut fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

This package includes:

1. Routines to control the input and output device.
2. Routines to convert numbers of 12 bits and 24 bit length or of Floating-Point format. 3. Routine to determine the octal form of a decimal Floating-Point number.

Other Programs Needed: Floating-Point Package, Version B (DEC-08-YQYB-PB)
Source Language: PAL III

DECUS NO. 8-679

MAPPER

James Puccio, Canton High School, Canton, Massachusetts

This program provides the TSS/8 PAL programmer with a method of mapping out precisely where in core his object program shall lie. The report is printed out on 8 1/2 X 11" pages, and a report of the total amount of core used is also provided.

Minimum Hardware: TSS/8, DISK, ASR-33, EAE
Storage Requirement: 2 TSS/8 DISK Segments
Restrictions: Will not operate properly if input file name is over 6 characters
Source Language: TSS/8 PAL

DECUS NO. 8-680

WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions

Nezih Geckinli, Middle East Technical University, Ankara, Turkey

The FWT subroutine enables the user to take either the Fast Walsh Transform (FWT) or its inverse (IFWT) of a real valued series. The subroutine FWT, which begins at Ø2ØØ, calculates both the FWT and IFWT.

Minimum Hardware: 4K PDP-8
Source Language: PAL III

DECUS NO. 8-681

CASE - Carleton Symbolic Editor

Bruce Christopher, Carleton College, Northfield, Minnesota

This symbolic editor adds new commands to the original EDIT-8 program copyright by DEC in 1970 and revised for TSS/8 by Rick Merrill (4/17/70). Among the new features are a new command H, to append from the high-speed reader; line numbers printed on the line-printer or teletype but not on the high speed punch; a command U, to release the high-speed reader, line printer and high-speed punch; tabs not followed by rubout in the ASCII disk file intra-buffer string searching and many others.

Minimum Hardware: TSS/8 22B, ASR-33, line-printer, high speed reader and punch, EAE
Storage Requirement: 4K
Source Language: PAL-8

DECUS NO. 8-682

SCPSYS (Scope System)

Donald C. Amoss, Clemson University, Clemson, South Carolina

"SCPSYS" (Scope System) is an editing, filing and assembling system for use on the PDP-8 computer equipped with DECtape, display and EAE. The interactive CRT based system provides quick user response and has shown to be instrumental in decreasing the time required for user familiarization. This has proven particularly beneficial in the educational environment. An interactive FOCAL/SCPSYS system has been developed to provide a more convenient means of saving FOCAL programs on DECtape. An adaptation to the FORTRAN-D system is also available which includes DECtape read/write commands and multi-level subroutine commands (basically a JMS rather than JMP).

DECUS NO. 8-682 (Continued)

Ancillary programs included in the basic system include a block-to-block "COPY" program, an octal listing (OLIST) program, a DECtape word manipulator (MODIFY), a program to convert existing DECUS files to SCPSYS (ADDECUS), and general purpose message display and interrogation programs (Q + A, for Question & Answer, UNPACK, and UNPACKD). This system, in various stages of development, has been in use by many users and several classes since the latter part of 1970.

Minimum Hardware: 4K PDP-8, TTY, DECtape, display
Source Language: PAL III

DECUS NO. 8-683

BNLOAD, TSS/8 Binary Loader

Bret Saxe, 1021 Washington Avenue, Albany, New York

BNLOAD is a TSS/8 user program to load binary format tapes directly into core. It is an alternative to the lengthy binary tape loading procedure (requiring PIP and LOADER) presently in effect on most TSS/8 installations.

Minimum Hardware: TSS/8, High-Speed Reader, TTY
Storage Requirement: 1 page (7600-7777)
Restrictions: Works only on TSS/8
Source Language: TSS/8 PAL-D

DECUS NO. 8-684

Injection Patcher - IJPA

Garth Peterson, South Dakota School of Mines and Technology, Rapid City, South Dakota

Injection Patcher accepts and stores program patches in field 1. Patches may be read in as binary tapes or may be entered in octal on the teletype keyboard. After the patches have been stored, a main binary input tape is read and a new main binary tape is punched out with patches inserted at the appropriate locations rather than being appended at the end. The srored patches may also be dumped as a binary tape.

Minimum Hardware: 8K PDP-8, paper tape reader and punch (high or low speed)
Source Language: PAL-D

DECUS NO. 8-685

DPSQRT - Double Precision Square Root for PDP-8

Jay Mickevicius, University of Illinois, Chicago, Illinois

DPSQRT is a subroutine to compute a single precision square root from a double precision argument. The argument is assumed positive and can be up to 24 bits in length. This program is a modification of DECUS 8-61.

Source Language: PAL

DECUS NO. 8-686

Bowling League Results, Standings and Averages

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

The purpose of this program is to automate the task of preparing weekly bowling results. These programs were written for a 16-team league and 128 bowlers, including substitutes. There is room for expansion if your league requires more teams and/or bowlers.

Average time per week is under thirty minutes.

Minimum Hardware: PDP-8/12 family, one mass storage device
Other Programs Needed: COS 3ØØ (DEC-08-OCOSA-A-UO) 8/E 12
Storage Requirement:
Source Language: DIBOL

DECUS NO. 8-687

GOLF

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program, written in DIBOL for the COS 3ØØ operating system, invites the user to play golf at the championship course just minutes from the heart of downtown Maynard. The game is explained as you proceed to the first tee.

Minimum Hardware: PDP-8/12 family, 1 mass storage device, high-speed reader
Other Programs Needed: COS 3ØØ (DEC-08-OCOSA-A-UO) 8/E 12
Storage Requirement: 8K
Source Language: DIBOL

DECUS NO. 8-688

FOOTBALL

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program is written in DIBOL and requires the COS 3ØØ operating system. With an LA3Ø as the console, it takes approximately 12 minutes to play a complete game. In the event of a tie at the end of regulation time, a sudden death overtime period may be initiated with the team that kicked-off to start the first half kicking again.

At the conclusion of the game, statistics on first downs, yards gained, passing, etc., will be displayed on the terminal and cumulative data will be updated on logical unit 5.

DECUS NO. 8-688 (Continued)

Minimum Hardware:	PDP-8/12 family; one mass storage device, high-speed paper tape reader
Other Programs Needed:	COS-3ØØ (DEC- 08-OCOSA-A-UO)
	8E
	12
Storage Requirement:	8K
Source Language:	DIBOL

DECUS NO. 8-689

UFDSPY - A TSS/8 Line-Printer UFD Dump Program

James Ward, Natick High School, Natick, Massachusetts

UFDSPY is a program designed to dump the user's file directory (UFD) in readable form onto the line-printer. A header is printed consisting of the user's account number, the system date, and column headings. Information printed for each file includes the file name, extension, protection code, number of segments occupied by the file, date of creation, pointer to retrieval, and the link to the next UFD entry. At the end of the listing the total number of blocks in use by the files on this account is printed.

Minimum Hardware:	TSS/8 Configuration and Line-Printer
Storage Requirement:	1K
Source Language:	PAL-D

DECUS NO. 8-690

RANDU

Lars Palmer, A B Hassle, Fack, Molndal, Sweden

This is the random number generator from DECUS 5-25 interfaced to the FORTRAN IV system. The routine also contains a possibility to generate a truly random starting point for the pseudo random sequence.

Minimum Hardware:	OS/8 system
Other Programs Needed:	OS/8 FORTRAN IV
Source Language:	RALF

DECUS NO. 8-691

ACCK Timeshare Accounting System

Lynn H. Macey, Computer Services, Associated Colleges of Central Kansas, McPherson, Kansas

The ACCK Timeshare Accounting System is a direct replacement for the present method of running CAT under the system account. Historical data is kept on DECtape and various reports may be generated from this data. Reports include: daily, weekly, monthly and year to date as well as an inactive and individual account reports. Output may be on the teletype or an optional lineprinter.

The DECtape for this system is available directly from the author, to insure the most current release.

Minimum Hardware:	TSS/8 - 22B, DECtape
Storage Requirement:	2K
Source Language:	PAL-D

DECUS NO. 8-692

OLEVX AND OLEVAX, 4-Channel Averager and Analysis System

Gary D. Paige, University of California, Irvine; Irvine, California

The OLEV software system is a signal averager and analyzer designed for on-line neurophysiological experimentation (stimulus-evoked potential data, etc.). Up to 4 analog channels can be processed simultaneously. Sweep rate and sweep time are selectable to speeds as fast as 18/sec. and 25.6 ms./swp., respectively; up to 128 sweeps averaged in a given trial. Averages are formed by initially averaging sweeps to form consecutive component averages, which are then averaged to form the end result (a 32-sweep average will be formed from 4 component 8-sweep averages initially formed by the 32 sweeps, for example). All data can be stored on DECtape for future automatic analysis, including peak-to-peak amplitude and peak-latency data within any designated time window. Graphs of such data can be formed and stored automatically as well.

Minimum Hardware:	PDP-8/I, AXØ8, 2 DTA units (TCØ1 software used)
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 8-693

A Programmed Learning Course in Boolean Algebra

William Swan, University of Calgary, Alberta, Canada

This program is intended to help students to learn the fundamentals of Boolean algebra, using the TSS/8 facilities.

Minimum Hardware:	PDP-8/I (TSS/8), TTY
Storage Requirement:	4K
Source Language:	PAL-D

DECUS NO. 8-694

Teletype Line Printer Emulator Handler for OS/8

Stanley R, Vivian, University of Manitoba, Winnipeg, Canada

This OS/8 handler emulates the LP08 line printer on the ASR33 teletype. It handles form-feeds, tabs, line overrun and paging. A character count automatically generates a carriage return-line feed whenever the count exceeds 72. A line count automatically pages at 62 lines by introducing 4 additional CR/LF's to produce 11-inch pages. Due to space limitations in the handler, vertical tab results in a single additional CR/LF. An attempt to read from the handler

DECUS NO. 8-694 (Continued)

results in an immediate normal exit. First entry to the handler generates 4 CR/LF's. There is no closing form-feed.

Minimum Hardware:	OS/8 System
Other Programs Needed:	OS/8 and BUILD
Source Language:	PAL-8

DECUS NO. 8-695

Real Time Display Processor for a KV8 Graphic System and KW8 Clock

Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of 10 subroutines for an 8K FORTRAN system which allows FORTRAN or SABR programs to display changing graphic data on a VTØ1 scope used in a non-storage mode. The display processor performs the necessary refreshing, using program interrupts, at the maximum speed of the KV8 hardware. Provision is provided for displaying points, lines, and circular arcs, for reading joystick coordinates, testing the joystick flag, reading characters from the teletype and obtaining elapsed time from the real time clock, which may be used to calculate coordinates as a function of time. Core required is five (5) pages.

Minimum Hardware:	PDP-8, TTY, KV8/VTØ1/H306; KW8 (E) Real Time Clock*
Other Programs Needed:	8K FORTRAN (Paper Tape, PS/8 or OS/8)
Restrictions:	KW8 Model "E" clock assumed; others may also work
Miscellaneous:	*Clock only used by timer subroutines, not required for display
Source Language:	SABR

DECUS NO. 8-696

DECTYP, One-Word Signed Decimal Print

John Briggs, 2615 E 32nd Street, Davenport, Iowa

This subroutine will type out the signed decimal integer corresponding to the two's complement number contained in the accumulator. Spaces are inserted in the output to place the right-hand digit in a predictable position.

This subroutine saves 32_8 locations compared to the 134_8 location routine for DECUS 8-214.

Minimum Hardware:	PDP-8, TTY
Restrictions:	Must not run over the end of a page where loaded
Source Language:	PAL-D, PAL III

DECUS NO. 8-697

DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - Edusystem 50)

David Dodell, 11 South Hollow Road, Dix Hills, New York

This program will take the contents of a DECtape block and print it out on your teletype. Some features of the program are:

(a) input is by octal numbers, (b) restarting by ↑ C, (c) error message, (d) will print out job number if the DECtape is assigned to another job, (e) size-location 0-577 in core, 2 TSS/8 Disk Segments, (f) extra line feeds possible between lines of dump.

Minimum Hardware:	TSS/8-Edusystem 50, DECtape
Storage Requirement:	2 TSS/8 Disk Segments
Source Language:	PAL-D

DECUS NO. 8-698

TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010

P. C. Diegenbach, Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands

A library of OS/8 FORTRAN callable subroutines to use the Tektronix 4010 (or 4002) terminal with storage scope (and a 4610 hardcopy device if available). The subroutines serve graphic and alphanumeric in and output.

Minimum Hardware:	OS/8 or OS/12 Operating System, Tektronix 4010 Terminal
Other Programs Needed:	FORTRAN II
Storage Requirement:	2K
Miscellaneous:	A LINCtape is available for OS/12 users
Source Language:	FORTRAN-SABR

DECUS NO. 8-699

MPS External Event Common Routines

Thomas McLeod, Digital Equipment Corporation, Maynard, Massachusetts

The Microprocessor Series offers a priority vectored external event module which allows the accessing of up to eight software routines. This software package contains two common routines which would be entered by all of the above eight routines. The first would be entered and 5 of 7 registers and status codes saved in Random access memory (RAM). A user routine would then be entered and processing accomplished. The final routine would be the Restore routine.

Restrictions:	Registers D & E are used for temporary storage
Source Language:	MLA (Microprocessor Language Assembler)

DECUS NO. 8-700

JET AMBUSH

Steven Roy, Digital Equipment Corporation, Maynard, Massachusetts

Jet Ambush is a C.R.T. game program designed to run on series 8 and 12 computers. It is intended that the user write his own plot routine for his own C.R.T., however, it comes with a PDP-12 C.R.T. control. It creates a 64 x 64 display and the plot routine can scale it to the C.R.T. size. The game tests the user's skill at shooting down jets which appear randomly over a hillside. Control is through the switch register. The initial dialog explains how to play.

Minimum Hardware:	4K PDP-8 or PDP-12
Source Language:	PAL III

DECUS NO. 8-701

TEXT: Readable Punch Handler for OS/8

Daniel Brown and Jim Van Zee, University of Washington, Seattle, Washington

This is a 2-page handler for the OS/8 monitor system which punches readable ASCII characters on a paper tape using the low-speed punch. A 4 x 6 matrix representation is used for each character. The handler may be used with FORTRAN and other system programs to add identification at the beginning of a tape.

Minimum Hardware:	PDP-8 or PDP-12 with teletype
Other Programs Needed:	OS/8, PS/8 or OS/12 Operating System
Storage Requirement:	2 pages
Source Language:	PAL-8

DECUS NO. 8-702

COGO-8

Digital Equipment Corporation, Maynard, Massachusetts

COGO is a problem-oriented computer language and programming system for solving geometric problems. Typical problems suitable for COGO include: control and land surveys, right-or-way surveys, subdivision planning, construction layout, highway and interchange design, bridge geometry.

A knowledge of programming is not required to successfully use COGO.

COGO-90, originally developed by Professor C. L. Miller and his staff at the Massachusetts Institute of Technology, has been extended and implemented by Computer Dynamics Incorporated to run on a PDP-10 computer. COGO-8 is the PDP-10 version which also has been extended and implemented to run on any (PDP-8, PDP-12) OS/8 FORTRAN IV system which includes a minimum hardware configuration of 16K of memory and two DECtapes. The speed and operation of COGO-8 is greatly enhanced by the use of a disk and Floating Point Processor.

The OS/8 Reference Manual and OS/8 FORTRAN User's Manual (DEC-S8-CFTNA-A-D) are helpful reference guides to the COGO operation.

DECUS NO. 8-703

AMORT: Incremental Amortization Schedule

Susan Conrad
Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

The program computes an amortization schedule given the interest rate, amount of the loan, number of years over which the loan is to be repaid, and conversion periods per year.

From this information, the program computes the periodic payment and the portion of the periodic payment applied to the principal, the portion of the periodic payment applied to interest, and the balance at the time of each payment. All numbers are rounded to the nearest cent.

Other Programs Needed:	OS/8 , 8K FORTRAN
Storage Requirement:	8K
Source Language:	FORTRAN

DECUS NO. 8-704

ANOV1: Analysis of Variance, Unequal N

S. Tobias, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program computes a one way analysis of variance, means, variances and standard deviations even though each of the subgroups has a different number of subjects.

Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K
Source Language:	FORTRAN

DECUS NO. 8-705

ARNORM: Area Under Normal Curve

Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

ARNORM is a function subroutine designed to compute the area under a normal curve in terms of Z standard deviations.

Other Programs Needed:	OS/8, 8K FORTRAN
Source Language:	FORTRAN

DECUS NO. 8-706

BITSET

R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

A set of three 8K FORTRAN function subprograms to permit the user to examine and/or set individual bits in a specified integer data word.

Other Programs Needed:	OS/8, SABR Assembler
Storage Requirement:	1 page
Restrictions:	Operates on integer data words only; uses EAE
Source Language:	SABR

DECUS NO. 8-707

CRSTAB: Cross Tabulation Program

L. G. Carter, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

CRSTAB is a cross-tabulation program for the analysis of survey type data. It permits the user to enter up to 9 responses to each of up to 60 questions. In conversational mode the user may indicate various tree-structure type combinations which are to be cross-tabulated. The maximum number of possible combinations is 2000 and the maximum number of responses on any combination is 2047. The tree structure may have up to 6 levels (from 2 to 6 questions may be cross tabulated at one pass).

Minimum Hardware:	PDP-8, Card reader, printer
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K
Miscellaneous:	Peripheral usage may be changed
Source Language:	FORTRAN

DECUS NO. 8-708

EMLP: Emory Linear Programming Package

F. W. Wood, R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This is a small linear programming package intended for class demonstration use and/or linear programming problems of limited size. It has been adapted for the PDP-8, running under the OS/8 (or PS/8 or DECsystem-8) operating system, from a program originally written for the IBM 1620 by F. W. Wood of National Steel Corporation. This version includes some minor corrections and changes. Much of the description is taken directly from his original documentation. Additions, changes, etc. are by R. L. Jensen. The programming language used for this version is 8K FORTRAN for OS/8. Input/output options may have to be modified for a particular configuration.

Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or larger
Source Language:	FORTRAN

DECUS NO 8-709

FINCA: A Computer Program for Financial Statement Analysis

D. Eiteman, R. L. Jensen, G. Chalmers, M. Gordon & others

Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program analyzes commonly published financial data, giving three pages of commonly used ratios and gives plots of earnings per share, sales and dividends. Up to ten years of data may be handled in 8K of core, and the program may easily be expanded if more core is available.

Minimum Hardware:	PDP-8, Card reader, printer (may be modified)
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or larger
Restrictions:	Uses 132 col. printer or must be reformatted
Source Language:	FORTRAN

DECUS NO. 8-710

MULTS: Multiple Regression Program

J. Capato, R. L. Jensen, B. Watzman, C. Curran, G. Michel
Submitted by: R. L. Jensen, School of Business, Emory University, Atlanta, Georgia

This program uses a least squares procedure to calculate the estimates of the partial regression coefficients in a multiple linear model. It provides several other statistics, permits extensive automatic transformation of data, and provides plots of user selected data.

Minimum Hardware:	PDP-8, Line printer to use plots
Other Programs Needed:	OS/8, 8K FORTRAN
Storage Requirement:	8K or more
Miscellaneous:	Submitted for 12K or larger, but may be segmented for 8K system
Source Language:	FORTRAN

DECUS NO. 8-711

Microprocessor Cross Reference Program for OS/8

Robert Tedford, Digital Equipment Corporation, Marlborough, Massachusetts

MXR8 is a cross reference program which operates on output from MLA8, the Microprocessor Cross-Assembler. It is written in PAL8 and runs under OS/8. MXR8 aids the programmer in writing, debugging, and maintaining assembly language programs by providing the ability to pinpoint all references to a particular symbol.

Minimum Hardware:	OS/8 System, DECtape or Disk Pack
Storage Requirement:	8K
Restrictions:	All characters after the first semi-colon in a statement will be ignored. Characters appearing after the first set of delimeters in a TEXT statement will be treated as a user symbol
Source Language:	PAL-8

DECUS NO. 8-712

IRSPEC: Calculation "On Line" of Far Infrared Spectra by Fourier Transform

M. Boniface, J. P. Huvenne, B. Boniface, Laboratorie de Physique et Mathematiques, U.E.R. de Pharmacie, Lille, CEDEX, France

IRSPEC enables the on-line acquisition of the signal given by a far-infrared Michelson Interferometer. It, simultaneously, computes the data Fourier transform after apodisation and displays the results. Many calculation loops, using all the data points every time, allow the user to observe the spectrum evolution and eventually to stop acquisition.

As soon as the wanted data have been completed (max. 2048) IRSPEC computes the final coefficients of spectrum (max. 200) and displays permanentiy the result which can then be printed or plotted. A reference spectrum can be stored to compute, from a sample spectrum, transmission (I/I.) or absorbance (log (I./I)).

Documentation for the program is written in French.

Minimum Hardware:	LAB 8/E with 8K
Other Programs Needed:	EAE, FPP
Restrictions:	FPP must be entered before IRSPEC
Source Language:	PAL III

DECUS NO. 8-713

FORTRAN Plotting Subroutines

Gregory R. Ruth, Charles Stark Draper Laboratory, Cambridge, Massachusetts

A collection of SABR coded routines (callable from 8K FORTRAN) that provide a comprehensive plotting capability for PDP-8's equipped with a Calcomp 565 plotter (either "encoded" or "unencoded") or equivalent. The functions provided cover pen movement, plotting character strings, plotting floating point numbers (with rounding), setting up a coordinate grid in an 8 1/2 " X 11" space, and plotting points in that coordinate space.

Minimum Hardware:	Standard OS/8 configuration, Calcomp 565 plotter
Other Programs Needed:	OS/8 Loader (relocatable)
Storage Requirement:	2 to 13 pages
Source Language:	SABR

DECUS NO. 8-714

PDPLST: PDP-8 - IBM 360/370 Cross Listing Program

R. E. Stickel, Jr., University of Kentucky, Lexington, Kentucky

PDPLST is an interface program which provides IBM 360-370 listings and-or decks of programs prepared using the DEC-08-ESAB PDP-8 Editor and dumped as core images onto IBM compatible magnetic tape. PDPLST is compatible with the SYSMON monitor system.

Minimum Hardware:	IBM compatible magnetic tape drive
Storage Requirement:	12K IBM Bytes
Source Language:	360/370 Assembly

DECUS NO. 8-715

F4 GRAPHICS

Dennis McGhie, Stanford Medical Center, Stanford, California

This is a set of four subroutines which allow plotting under OS/8 FORTRAN IV. Included are subroutines for driving a plotter (XY12 or VP8/I) or buffering plotter commands to a file in a format compatible with PLOTVS (DECUS NO. 12-157). Entries are also provided for automatic scale setting, character plotting, and string plotting. The character and string routines are written in FORTRAN. The pen move routines are written in RALF.

Minimum Hardware:	Mass storage (min. OS/8, Disk is recommended for F4)
Other Programs Needed:	OS/8 FORTRAN IV
Storage Requirement:	8K
Source Language:	FORTRAN IV and RALF

DECUS NO. 8-716

Exponential Functions

Robert H. Tedford, Digital Equipment Corporation, Maynard, Massachusetts

This program runs on the Microprocessor (MPS) and contains some useful subroutines, double precision multiply, double precision add and binary to decimal conversion (both integer and fraction). e^X is calculated for nine stored values of X. The source program is written in the Microprocessor Assembly Language.

Minimum Hardware:	MPS Microprocessor
Storage Requirement:	1K
Source Language:	MLA

DECUS NO. 8-717

F4EAE - EAE OVERLAY FOR FRTS

Phillip D. Siemens, Lawrence Livermore Laboratory, Livermore, California

This collection of arithmetic routines overlays FRTS (DEC-S8-LRTSA-A-PS 5/73) in the OS/8 FORTRAN IV system. It enables a PDP-8/I (or classic PDP-8 with conditional assembly) to utilize its EAE option. Approximately a 20% increase in overall execution speed can be obtained with this overlay.

Minimum Hardware:	8K PDP-8/I, EAE, Mass Storage
Other Programs Needed:	OS/8 FORTRAN IV 'FRTS'
Source Language:	PAL-8

DECUS NO. 8-718

NSD - Nominal Standard Dose

Pei-nan Tsung, Ph.D., The Buffalo General Hospital, Buffalo, New York

This program furnishes the result of calculating nominal standard dose values for complex treatment schedules which allow changing in fractionation pattern per week and up to two consecutive split course radiotherapy.

Minimum Hardware:	8K OS/8 System
Source Language:	FORTRAN

DECUS NO. 8-719

OS/8 Software for a TC58 Magtape Control

W. Kenneth Patton and Terrence D. Lagerlund, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This is a package of three programs which extend the input/output capabilities of system, user, and 8K FORTRAN programs in OS/8 to include the TC58 magnetic tape. The first is a TC58 device handler (2 page, non file-structured) that includes six special function calls and can use any desired tape recording format. The second is a set of nine SABR subroutines (FORTRAN-callable) that provide formatted and unformatted tape input/output and special functions (endfile, spacing forward and reverse, rewind). The third is a SABR main program which allows the operator to position and write EOF marks on a tape, dump records in octal, and write test data.

Minimum Hardware:	TC58 Magtape Control, TU20 or equivalent; Tape Drives (up to 8; any combination, 7 or 9 track)
Other Programs Needed:	OS/8, 8K FORTRAN System, PAL-8, BUILD
Storage Requirement:	8K
Restrictions:	No EOF written to close tape files. Does not use TC58 Continue mode
Source Language:	PAL-8, SABR

DECUS NO. 8-720

LSTDMP: Binary Tape Dump/Lister

Mark Jaffe, General Electric Company, Ocean Sciences Lab., Philadelphia, Pennsylvania

This is a modification of DECUS 8-533 which enables the program to function as a mini-disassembler or a "binary tape dump" program, depending on switch options.

The program will recognize and print field settings; no attempt is made to decode instructions, however.

Minimum Hardware:	4K PDP-8/E, TTY; HSR/HSP optional
Restrictions:	Operates ONLY on PDP-8/E
Source Language:	PAL III

DECUS NO. 8-721

LISP - 8K

Marton Zsenei, Central Research Institute for Physics, Budapest, Hungary

This is an 8K version of the LISP Interpreter (see DECUS No. 8-102a). Only the differences are given in the documentation so it would be well to request the 8-102a write-up as well.

Minimum Hardware:	8K PDP-8, TTY, HSR/HSP
Source Language:	PAL III

DECUS NO. 8-722

Mini-Copy

Philip Hunt, Middletown TWP. High School, Middletown, New Jersey

This program when loaded and started at 00200 will accept data, either Binary or ASCII from the high speed reader, a character at a time and send it out to the low speed punch on the ASR33 teletype.

Other Programs Needed: Bootstrap Loader
Source Language: PAL-D

DECUS NO 8-723

Function Comp.FT

R. L. Jensen, Emory University, Atlanta, Georgia

An 8K FORTRAN function subprogram designed to compare two A6 fields for proper collating sequence and/or identity matching.

Minimum Hardware: PS/8 or OS/8 Operating System
Other Programs Needed: 8K FORTRAN
Source Language: FORTRAN/SABR

DECUS NO. 8-724

Computer Catalog System

Preston M. Crabill, Lehigh University, Bethlehem, Pennsylvania

These three FORTRAN programs were prepared to enable better accessibility to catalog files and to allow speedier information retrieval.

The WRITE program is set up to allow an operator to place catalog information on a specified file. The catalog information includes: catagories (a means of easy cross reference), vendor names, and key words pertaining to the vendor's catalog.

The MODIFY program enables an operator to ask for a specific reference number and modify it to his liking.

The SEARCH program allows easy information retrieval. Key words, vendor names, or catagories may be searched, and all of the information under pertinent reference numbers will be printed out on the teletype.

Minimum Hardware: OS/8 Configuration with teletype and two DECtapes
Source Language: FORTRAN and SABR

DECUS NO. 8-725

The Pipe Stress Problem on a PDP-8/F

Theodore E. Bridge, 54 Williamsburg Drive, Springfield, Massachusetts

This program may be used to calculate thermal expansion stresses in piping systems. It can handle multi-anchor systems with as many as 15 anchors. The program comes in two overlays. The first will edit and verify the input data, and draw a crude picture on the teletype to verify the geometry. The second will calculate stress and displacements at every point.

Minimum Hardware: 4K PDP-8/F, ASR33
Other Programs Needed: 3 Page Floating Point Package (DECUS 8-375B)
Source Language: PAL

DECUS NO. 8-726

An OS/8 Handler for the Varian Statos 21 Line Printer

Ernest M. Stokely, University of Texas Health Science Center, Dallas, Texas

A two-page, OS/8 compatible handler for the Varian Statos 21 electrostatic line printer. The handler has been incorporated into the OS/8 monitor system and used for several months without problems.

Minimum Hardware: OS/8 Configuration, Varian Statos 21 Line Printer
Other Programs Needed: OS/8 Monitor System
Storage Requirement: 8K
Restrictions: For rolled paper; handler ignores line feeds; vertical tabs must use optional hardware stops
Source Language: PAL-8

DECUS NO. 8-727

Disassembler

Jeff Nisler
Submitted by: Doris J. Stoudenmire, Walt Whitman High School, Huntington Station, New York

DISASSEMBLER is used to translate binary tapes to readable mnemonic symbols. It is a stand alone which may be used in a monitor system. Output is in two forms: 1) a source tape listing; 2) a pass 3 listing. A paging option is also available, as well as an option for HSR/LSR.

Minimum Hardware: 4K PDP-8; ASR33; Option for PCØ8 Reader
Source Language: PAL III

DECUS NO. 8-728

MEND

Jeff Nisler
Submitted by: Doris Stoudenmire, Walt Whitman High School, Huntington Station, New York

MEND gives options in copying, mending, and patch inserting with system tapes. It may be used alone or in a monitor system. More than one option may be requested during program execution.

Minimum Hardware: 4K PDP-8, ASR33, PCØ8
Source Language: PAL III

DECUS NO. 8-729

DS340 DEMO Package

Business Products Group, Digital Equipment Corporation
Submitted by: Gene Naddeo, Digital Equipment Corporation, Maynard, Massachusetts

The demonstration programs contained in this package range from data entry and generalized bookkeeping to a calendar program. Although complete in themselves, these programs should not be considered a complete application package since they do not have the support programs needed to maintain the data files.

To insure accessibility to any COS300 user regardless of input media, the actual program material should be requested directly from Mr. Naddeo of DEC's Business Products Group. Distribution fees will be compatible with DECUS Service Charges.

Minimum Hardware: PDP-8, VTØ5, LS8E, RKØ8 or RK8E
Other Programs Needed: COS300 Operating System
Storage Requirement: 12K
Source Language: DIBOL

DECUS NO. 8-730

CORVU: A Display and Teletype Input/Output Program

F. G. Oakham, University of Toronto, Toronto, Canada

CORVU allows the user to examine and modify the contents of core of a PDP-8/E via the TTY in a manner similar to ODT. It can also display in octal form the address and contents of up to 128_{10} locations on a model 601 Tektronix storage oscilloscope. It operates under interrupt, and the basic program (not including interrupt and a dummy background program or options) occupies only three pages of core (7000_8-7611_8). Thus it is ideal for use with a large background program when core space is at a premium. A non-store option MOV1 is also available.

Minimum Hardware: Essential: PDP-8/E, ASR33, Tektronix 601 scope (or equivalent). 3 channels A to D (program could probably be adapted for use with VC8-E) Useful: Relay output to operate erase, EAE and two D to As.
Storage Requirement: 0-5, 6200-7611 for stand-alone program
Source Language: PAL

DECUS NO. 8-731

MEMO IV

Gregory Ruth, Charles Stark Draper Laboratory, Cambridge, Massachusetts

MEMO IV is a program written for the OS/8 system to produce right- and left-justified paged text from free form text. The intention is to permit the user to produce a readable and neatly formatted document with minimal effort. This is a descendant of earlier programs MEMO and MEMO II (DECUS No. 8-427a - Removed). This version adds several new features, most notably the capability for directing output to any OS/8 compatible device (rather than restricting it to the teletype. Files written for previous versions of MEMO are compatible with MEMO IV.

Minimum Hardware: OS/8 Configuration
Storage Requirement: $0 - 5377_8$
Source Language: PAL-8

DECUS NO. 8-732

BAVIRF - A Virtual File UDEF for OS/8 BASIC

Stanley R. Vivian, University of Manitoba Faculty of Medicine, Winnipeg, Canada

This overlay to OS/8 BASIC permits random access to the data in up to four numerical files - which may be of fixed or variable length. The maximum file length can contain 170,080 floating point numbers. The two functions, GET(F,L) and PUT(F,L,V), will retrieve, or deposit a value V, from or into location L of file F. Variable files are automatically expanded as needed. Users may switch from random to sequential access and vice versa. Full error checking is included to diagnose attempts to: access idle or non-numeric files; GET or PUT beyond the end of file; and, access data not within locations 1 to 170,080.

Minimum Hardware: OS/8 Configuration
Other Programs Needed: OS/8 BASIC V3
Storage Requirement: 300_8
Source Language: PAL-8

DECUS NO. 8-733A

PDP-8/E RJE System (IBM 2780 Emulator)

University of Iowa Computer Center
Submitted by: William F. Decker, University of Iowa, Iowa City, Iowa

This program is designed to simulate an IBM 2780 communicating with an IBM 360/370 system running IBM OS/HASP software. The PDP-8/E RJE package currently supports a card reader, line printer, papertape reader punch, synchronous line unit and cyclic redundancy check option.

Characteristics of the software include: EBCDIC transmission code; Horizontal format record processing for printing; Multiple record buffers; Papertape reader/punch support; Transparency for transmission or reception.

The PDP-8/E RJE terminal can support several local functions such as: card-to-printer, printer-to-papertape, papertape-to-printer and papertape-to-papertape operations.

Minimum Hardware:	PDP-8/E, DK8EA, CR8F, LE8, DP8EA, KG8EA, LA36 (PC8E Optional)
Optional Hardware:	Any OS/8 configuration. NOTE: The PDP-8 Remote Job Entry System is not supported under OS/8. However, this hardware is only needed to modify the source DECtape provided.
Optional Software:	OS/8 (Needed to reassemble source.)
Storage Requirement:	8K
Source Language:	PAL III

DECUS NO. 8-733B

Software Support Manual for PDP-8/E RJE System

University of Iowa Computer Center
Submitted by: William F. Decker, University of Iowa, Iowa City, Iowa

This manual offers support material for the program described above.

DECUS NO. 8-734

Microprocessor Language Assembler for OS/8

Robert Tedford, Digital Equipment Corporation, Marlborough, Massachusetts

This program is written in PAL-8 and requires the OS/8 operating system. It is a modified version of MLA, the cross-assembler for DEC's Microprocessor based on the Intel 8008 chip.

Minimum Hardware:	OS/8 System, DECtape or Disk Pack
Storage Requirement:	8K
Restrictions:	In a direct assignment statement, the equal sign must be the symbol delimiter
Source Language:	PAL-8

DECUS NO. 8-735

DSP8; Diagnostic Support Package for the PDP-8

John C. Alderman, Jr.; Gwen N. McAllen
Submitted by: William H. Posey, Digital Communications Associates, Inc., Atlanta, Georgia

DSP-8 is a collection of useful subroutines and conventions for programming a small computer (the PDP-8 family, in this case), which specifically facilitates the task of the diagnostic programmer in creating diagnostics to test hardware peripherals for the system. Some considerable thought has gone into the writing of the specifications for the components of this package, and the experience of the authors in writing maintenance diagnostic is the major basis of the choice of available elements of this package.

Because the DSP8 source can only be assembled by a PS/8 or OS/8 configuration, the ASCII paper tape offered is for DSP8P, a PAL3 assemblable source file for smaller configurations.

Minimum Hardware:	Teletype required for users at I/O facilities
Storage Requirement:	1600 words maximum
Source Language:	PAL-8

DECUS NO. 8-736

Paper Tape Reader-Printer

W. E. Hamilton, 212F Red Oak Drive East, Sunnyvale, California

This is a utility used to "dump" the contents of an ASCII coded paper tape. The teletype is used for both input and output, however the high speed reader and/or a special Centronics printer may be used.

Codes such as "Line Feed," "Space" and "Rub Out" will be printed as "LF," "SP" and "DEL" respectively. PTRP does not actually execute the data being read in, thus it gives an "honest" indication of what is "really" on the tape.

Minimum Hardware:	ASR33 High Speed Paper Tape Reader (optional)
Source Language	PAL III

DECUS NO. 8-737A

Four Word Floating Point Package for MPS

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This package is a 4-word floating point system for MPS, Digital Equipment's Microprocessor based on the Intel 8008 chip.

The basic operations included in this package are GET, PUT, ADD, SUBTRACT, MULTIPLY, DIVIDE, NORMALIZE, INPUT, OUTPUT, NEGATE and FIX. Extended functions are described in the companion package (DECUS 8-737B).

Minimum Hardware:	MPS
Other Programs Needed:	User program
Restrictions:	Block 23 must be RAM
Source Language:	PAL-8

DECUS NO. 8-737B

Four Word Floating Point Functions for MPS

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This function package was written for use with the Four Word Floating Point for MPS (DECUS 8-737A) and includes subroutines to evaluate square, square root, sine, cosine, arctangent, natural logarithm and experimental functions.

Minimum Hardware:	MPS
Other Programs Needed:	DECUS NO. 8-737A
Source Language:	PAL-8

DECUS NO. 8-737C

Rudiementary Calculator for MPS Four Word Floating Point Routines

Robert H. Tedford, Digital Equipment Corporation, Marlboro, Massachusetts

This is a minimum space program to perform calculations with the precision of the Four Word Floating Point Package for MPS (DECUS 8-737A) and to use the Four Word Floating Point Function Package (DECUS 8-737B). Operations are performed in the sequence in which they are entered. Up to seven user-defined operation routines may be called.

Minimum Hardware:	4K MPS, ASR33
Other Programs Needed:	DECUS 8-737A and DECUS 8-737B
Storage Requirement:	1K
Source Language:	PAL-8

DECUS NO. 8-738

The Business Management Laboratory

R. L. Jensen, Emory University, Atlanta, Georgia

The Business Management Laboratory is a medium to large scale management game intended for use in schools or management training programs. It permits 3-8 teams (firms) to compete in a consumer durables market, while they make decisions in the areas of marketing, finance, production and accounting control. The degree of complexity can be controlled, so that the game has been used in introduction to business courses as well as graduate policy courses.

The program is provided in FORTRAN IV source form only. The complete DECtape includes the simulation program (as several subroutines), test and set-up data, several auxiliary programs, and compiling/implementation instructions.

Minimum Hardware:	OS/8 or DECsystem-8
Other Programs Needed:	Information concerning availability of participants' and administrators' manuals are included with the write-up
Storage Requirement:	16K
Source Language:	FORTRAN IV

DECUS NO. 8-739

COPY.PA

Glen L. Brydon
Submitted by: John W. Cowan, Glen Ridge High School, Glen Ridge, New Jersey

This OS/8 device handler allows OS/8 users with one TD8E DECtape drive as their system device to easily move files from one tape to another using OS/8 system programs such as PIP. COPY provides the single-DECtape user some of the power of multiple-DECtape systems, at the expense of some time and effort changing tapes. It insures the integrity of transfers through an error recovery system which allows retries to be ordered if the handler was unable to read a damaged tape.

Minimum Hardware:	PDP-8/M, TU56H with TD8E
Other Programs Needed:	OS/8 monitor
Storage Requirement:	1 page handler
Restrictions:	Limited error recovery
Source Language:	PAL-8

DECUS NO. 8-740

Theorem Prover for the Propositional Calculus

Dr. A. K. Head, C.S.I.R.O. Division of Tribophysics, University of Melbourne, Parkville, Australia

This is a complete LISP program with examples which runs under PDP LISP (DECUS 8-102a). It considers proposed theorems in the propositional calculus and decides if they are true or false. It is based on the Wang algorithm and

DECUS NO. 8-740 (Continued)

offers a choice of trace print out of steps involved in proving or disproving a theorem.

Minimum Hardware:	4K PDP-8 & Teletype
Other Programs Needed:	DECUS 8-102a
Source Language:	LISP

DECUS NO. 8-741

SD8SY and SD8X - Two Handlers for the TD8E Simple DECtape

W. van der Mark, Swiss Federal Institute of Technology, Zurich, Switzerland

This package consists of two handlers to be inserted via BUILD.SV into the OS/8 V3 operating system. They are a replacement for the resident and non-resident TD8E DEC handlers. Both handlers will run with the interrupt switched on and will permit a data acquisition rate of 50 CPS.

Minimum Hardware:	PDP-8/E, M, F, A with TD8E simple DECtape (12K if no disk)
Other Programs Needed:	OS/8 V3 operating system (Can be modified for older BUILD.SV versions
Storage Requirement:	Both handlers are two-page
Restrictions:	MQ register is used
Source Language:	PAL-8, V9B

DECUS NO. 8-742

CLOCK - A Real-Time Clock/Calendar Routine

P. K. Hastings and L. R. Tilley, Catalytic, Inc., Charlotte, North Carolina

A clock/calendar routine for keeping track of time in PDP-8 computers. This routine keeps up with minute, hour, day, month and a year. It was designed to be used with a real-time clock.

Minimum Hardware:	PDP-8 with Real-Time Clock
Other Programs Needed:	Interrupt Service Routine
Source Language:	PAL III

DECUS NO. 8-743

FILFIX - TSS/8 File Structure Repairing and Restructuring Program

Richard Wilson, Digital Equipment Corporation, Maynard, Massachusetts

FILFIX is a stand-alone utility program which analizes, repairs and restructures the files of any standard TSS/8 configuration. FILFIX enables a TSS/8 system to be rebuilt without losing the previous contents of the library on the system disk, and is also capable of correcting certain types of errors in the directory.

Minimum Hardware:	PDP-8, 8/I, 8/E
Other Programs Needed:	TSS/8 Operating System
Storage Requirement:	12K
Source Language:	PAL-8

DECUS NO. 8-744

TSTCDR - TSS/8 Card Reader Diagnostic

Richard Wilson, Digital Equipment Corporation, Maynard, Massachusetts

This is a TSS/8 card reader diagnostic which is designed to run under TSS/8, version 8.24. The diagnostic makes use of standard alpha and binary test decks, either 40 or 80 column.

Minimum Hardware:	PDP-8, 8/I or 8/E with card reader
Other Programs Needed:	TSS/8
Storage Requirement:	12K
Source Language:	PAL-8

DECUS NO. 8-745

LEP - Linear, Exponential and Power Function Curve Fit

Pei nan Tsung, Ph.D., The Buffalo General Hospital, Buffalo, New York

Curve fitting for straight line, exponential curve fit, power function fit and e-exponential curve fit. The sample size of ordered pairs (x_i, y_i) is 30. All the calculations are based upon the method of least squares.

Minimum Hardware:	8K OS/8 System
Source Language:	FORTRAN II

DECUS NO. 8-746

Device Handler for Tektronix 611 Storage Scope

Shlomo Z. Ron, New York City Health and Hospitals Corp., New York, New York

KV is a four page read and write non-file structured device handler under the OS/8 operating system. Since only 2 pages are allowed for an OS/8 device handler, the other two pages have to be in core in any 2 consecutive pages which are not destroyed by the program that uses this device handler.

Minimum Hardware:	PDP-8/E, KV8E and storage scope
Other Programs Needed:	OS/8
Storage Requirement:	2 pages besides the device handler
Restrictions:	Can be used if program does not destroy 2 consecutive pages in any memory field
Source Language:	PAL-8

DECUS NO. 8-747

STAGE2 MACRO Processor

Jonathan Gross, SSRFC, University of Minnesota, Minneapolis, Minnesota and W. M. Waite, EE, University of Colorado, Boulder, Colorado

STAGE2 is a general purpose macro processor designed by W. M. Waite, and may be used as a front end to other languages such as SABR, FORTRAN and BASIC. Device independent I/O, and access to several files allows for flexible processing and multiple passes within the macro processor. Macro calls are recognized by a pattern matching scheme that allows for flexible syntax in macro definition. The special characters controlling the macro processor may be easily defined so that they do not interfere with the host language. Handles upper and lower case, and control characters. STAGE2 is itself written in a language (FLUB) that is translated by STAGE2 into PAL-8.

Minimum Hardware:	Will run only on PDP-8/E, F or M with EAE
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	12K to 32K
Restrictions:	All macros must be defined at beginning of source code
Source Language:	PAL-8, STAGE2 (FLUB)

DECUS NO. 8-748

SMØ4 - OS/8 to Disk-Monitor ASCII File Converter

Gerald A. Sabin, 6022 Sage Drive, Orlando, Florida

SMØ4 will be found useful by regular users of DEC's Disk Monitor. It is a utility program that will convert an ASCII file on an OS/8 DECtape reel into an ASCII file on Disk-Monitor DECtape. User needs to know the absolute block numbers of his input OS/8 ASCII file. SMØ4 will output, via Disk-Monitor, into a file named by the user.

SMØ4 is written in FORTRAN-D and uses a number of FORTRAN tricks that have appeared in DECUSCOPE over the last few years to accomplish the required machine language subroutines.

Minimum Hardware:	4K PDP-8, 2 DECtape transports, TTY
Other Programs Needed:	Disk-Monitor System
Source Language:	FORTRAN-D

DECUS NO. 8-749

UFAXØ8 - A LAB-8 (AXØ8) Set of User-Defined-Functions for OS/8 BASIC

Stanley R. Vivian, University of Manitoba Faculty of Medicine, Winnipeg, Manitoba, Canada

The standard LAB-8/E user-defined-functions distributed with OS/8 BASIC, V3, have been modified to function on the original LAB-8 (PDP-8 with AX08 laboratory peripheral). The general philosophy of these modifications has been to make them in such a way that programs that run on the LAB-8/E will also run on the LAB-8 (AX08) without changes. The functions, their argument structures and execution logic are essentially the same as in the LAB-8/E version as documented in the OS/8 Handbook - DEC-S8-OSHBA-A-D.

Major differences are: 1) CLK - prints setting of RC clock; 2) SAM - will not sample digital registers; 3) DRI - reads contingency bits; 4) DRO - sets or clears digital outputs.

Minimum Hardware:	OS/8 Configuration with AXØ8 Laboratory Peripheral (options XR, XC, XM)
Other Programs Needed:	OS/8 BASIC V3 (or V1)
Storage Requirement:	3400-4577
Source Language:	PAL-8

DECUS NO. 8-750

Paper Tape Display

Thomas Ford
Submitted by: Jeffrey A. Merrow, White Mountains Regional High School, Whitefield, New Hampshire

This program, designed for display purposes, was originally produced by Thomas J. Ford using FOCAL 5/69 and will type each tape punch as six characters long, and four high, except for the sprocket holes, which are four characters long as well as high.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	2ØØ-363

DECUS NO. 8-751

FORTRAN IV for OS/8 FORTRAN II Users

John Cowan, Glen Ridge High School, Glen Ridge, New Jersey

FORTRAN IV for OS/8 FORTRAN II Users is a manual of implementations and subroutines simulating most of the features of standard and OS/8 FORTRAN IV, with the exception of double-precision routines. These routines will not work under the paper tape FORTRAN. INVENT-8 (DECUS8-610) and DPARITH (DECUS 8-597.12) are assumed: that is, they are not used, but features they provide have not been duplicated.

Minimum Hardware:	8K OS/8 System
Other Programs Needed:	OS/8 FORTRAN II
Restrictions:	Not source compatible with OS/8 FORTRAN IV; Double precision not implemented; Complex numbers not yet implemented
Source Language:	FORTRAN II, SABR

DECUS NO. 8-752

MIG8E2 - Monitor of Interruptions Which are Generated by the PDP-8/E Peripherals

Alain Beysen, SNECMA, Centre de Etudes de Villaroche, Moissy Cramayel, France

This general purpose program will handle the priority scheduling of different I/O devices, with a minimum of disturbing time. It provides: hardware and software interrupts, 12 levels of priority plus background plus interrupt off, saving all active registers (including arithmetic and memory extensions) plus one memory, loading in 3 pages of core plus 16 memories page Ø in field Ø, queuing low levels of priority, masking interrupts if wanted, high speed servicing -- and no bugs -- hopefully.

Minimum Hardware:	4K PDP-8/E with interrupt facilities
Miscellaneous:	Documentation and listing comments are in French
Source Language:	PAL III or PAL-8

DECUS NO. 8-753

OS/8 System Output Handlers

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

This package contains three two-page handlers and a program which accepts one input file and types it simultaneously on devices 04 (console) and 41 (commonly the first extra TTY or DECwriter). Two of the handlers were written for a console teletype or DECwriter; the third for the LS8E Centronix matrix printer.

Minimum Hardware:	8K OS/8 Configuration
Other Programs Needed:	OS/8
Source Language:	PAL-8

DECUS NO. 8-754

NUMBER and REDATE - OS/8 File Utility Programs

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

These programs help to facilitate the handling of certain OS/8 files that are in some way peculiar, e. g. in having no file date or a bad file date, or in containing illegal characters in name or extension.

Minimum Hardware:	PDP-8/E or later
Other Programs Needed:	OS/8
Storage Requirement:	8K
Restrictions:	NUMBER of use mainly to OS/8 V3 and later
Source Language:	PAL-8

DECUS NO. 8-755

OCTYPE - Octal Memory Dump

Jeffrey A. Merrow, White Mountains Regional High School, Whitefield, New Hampshire

OCTYPE's purpose is to output specified blocks of memory as: The current location, followed by: data located there. Input is from the teletype keyboard or low speed reader. The program will halt after each block is printed, but can be recovered by pressing CONT.

Minimum Hardware:	4K PDP-8, ASR33
Source Language:	PAL III

DECUS NO. 8-756

ASCON - ASCII File Converter

Steven Zimmerman, Boston V. A. Hospital, Department of Nuclear Medicine, Boston, Massachusetts

This program takes a standard 64 character ASCII file of the type produced by EDIT and translates it into a 96 character ASCII file. It is primarily intended for taking text which is all upper case and translating it into standard upper and lower case, usually for eventual output to a line printer.

ASCON is particularly powerful in combination with MEMO IV (DECUS 8-731).

Minimum Hardware:	PDP-8, PDP-12
Other Programs Needed:	OS/8
Storage Requirement:	8K
Miscellaneous:	LINCtape offered contains binary, ASCII, Save, listing and write-up files
Source Language:	PAL-8

DECUS NO. 8-757

OS/8 Utility Package

A. Windram
Submitted by: L. C. Chapas, The Grasslands Research Institute, Hurley, Maidenhead, Berkshire, England

This package consists of the following programs:

CORMAP - will produce a map for binary files showing where they load in memory. It is an alternative to OS/8 BITMAP, and offers more concise output and additional facilities. Both absolute and relocatable binary files can be mapped.

FORMAT - allows program tapes to be prepared off-line, and then converted to a standard on-line format. Strings of spaces are replaced by tab characters in a more intelligent way than EDIT, and some reformatting is done.

FIXCD - one-time program to fix several known bugs in Command Decoder (PS/8 and OS/8 V1 and V2 only).

DECUS NO. 8-757 (Continued)

XDIREC - selectively lists files by file-names or extensions. Options allow listing of up to 8 additional information words, listing of core-control blocks for core-image files, and listing of FORTRAN II library directories.

FHANDL - allows file-handling in normal or special mode of Command Decoder, using block-, word-, or character-oriented transfer, with the ability to handle several input and output files simultaneously.

F2SUB - the first 5 modules will run on any PDP-8 processor. The 6th requires a PDP-8/E, and the 7th a PDP-8/E with EAE.

1. MOVE - Allows moving or zeroing of real or integer arrays be means of a single subroutine call instead of a DO loop. Needs 1 page.

2. MKRSET - Gives direct-access handling for Stream 4 input. Needs 1 page.

3. ICARD - A routine for reading cards in binary. Needs 1 page.

4. UTIL - This is the OS/8 V1 UTILITY module, with an in-core encode/decode facility added. Binary only. Needs 4 pages.

5. FFFINP - Free-format input package for numeric and character input, and character comparison, using any stream. Needs 5 pages.

6. RWIOH - This is the OS/8 V1 READ/WRITE/IOH module, modified to output even-parity characters. Binary only.

7. LOGIC - Provides 9 logic functions (AND, OR, NOT, SIDE-ADD, SHIFT-LEFT, SHIFT-RIGHT, SET BIT, CLEAR BIT, TEST BIT). Needs 1 page.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	OS/8 PS/8
Source Language:	PAL-8; SABR for F2SUB

DECUS NO. 8-758

Super Hardware Bootstrap Code for the TC08/TC01 on a MI8E

Ricky Schrieber/Charles Lasner (P?S), Forest Hills, New York

Due to the hardware implementation of the MI8E bootstrap loader, it is necessary for the option to ground PWR NOT OK to cause a power clear sequence. On the RK05's this causes the heads to retract in case of a real failure, so to cover up for this and to leave a message logged on the console TTY a hack was made to have it type INITIALIZING then wait for the drive and do a standard OS/8 RK8E bootstrap.

Well, here is one for the TC08/TC01 that will rewind unit 0, print the message INITIALIZING and then proceed to bootstrap to what looks like a standard TC01 bootstrap.

Minimum Hardware:	PDP-8/E/F/M; TC08/TC01; MI8E
Restrictions:	Might fail MI8E diagnostic due to self-modification
Source Language:	PAL

DECUS NO. 8-759

USLIBA - FORTRAN II Subroutines for Binary Data Transfer

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

USLIBA contains five SABR-written subroutines which are useful on evaluating absolute integer binary data in FORTRAN II.

DATAM prints the OS/8 date, ADFAC helps users with an A/DC to evaluate their conversion factor: A/DC integer value to real voltage, DCHAN stores integer data from DF 2 into the "COMMON" area in DF1, ADCOM combines ADFAC and DCHAN, storing the real voltages of integer A/DC values from DF 2 into the COMMON area in DF 1, RDATA finally reads integer data from the OS/8 SYS device from a file into core. These data files can be created by means of another program also available from DECUS: "WDATA" - DECUS 8-761.

Minimum Hardware:	OS/8 Configuration
Other Programs Needed:	Recommended: WDATA - DECUS 8-761
Storage Requirement:	The 5 routines each need from 1 to 3 pages
Source Language:	SABR

DECUS NO. 8-760

FASTAD - User Oriented Data Collection on One A/DC Channel

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

FASTAD is a program for user-oriented data collection on one A/DC channel with one big buffer. Up to 4K core can be filled with A/DC samples.

FEATURES:

Start of measurement by TTY, Schmitt triggers (of DK8-EP), or external Clock input A/DC at maximum speed (ca 40.7 [KHZ]), Clock determines the sampling frequency with a maximum error of ± one [HZ].

A/DC with the Clock controlling the sampling frequency from a ca 34 [KHZ] to arbitrary slow rates.

A time delay after trigger start and before A/DC start can be chosen

DECUS NO. 8-760 (Continued)

In a thorough dialogue-and test-part the user can select his choice of the offered possibilities, test and calibrate the input signals, triggers, etc. After the measurement has been finished the user can have a test output of selected buffer points on the terminal (user determines selection) and repeat his special choice of measurement without a new run through the long dialogue-and test-part.

By means of WDATA (DECUS8-761) the OS/8 user can store his data on files on the SYS-device and by means of USLIBA (DECUS 8-759) he can evaluate these data in FORTRAN II programs very comfortably.

The buffer and A/DC program parts can be changed easily: the Write-up contains the necessary help for other users to fit this program to their needs.

Requirements: PDP-8/E with at least 8K core, 12K better; a Real Time Clock 'DK8-EP'; An A/D converter 'ADØ1-AP' or other A/DC types with multiplexer; OS/8 configuration are not necessary but an advantage

Software: DEC's Floating Point Package (EAE or NON EAE) (DEC-8E-NEAEA-A-PB) or (-Ø8-NFPPA-A-PB); TTYIO(DECUS 8-762); For OS/8 users: WDATA(DECUS 8-761) and USLIBA (DECUS8-759) strongly recommended

Source Language: PAL-8

DECUS NO. 8-761

WDATA - Subroutine to Write Absolute Binary Data on SYS-Device

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

WDATA is a subroutine for writing absolute binary data on the OS/8 SYS-device.

Format: sequential blocks of $400_8 = 256_{10}$ data each.

By means of 'USR' the user opens his data-file and then WDATA writes the buffer contents to the sys-device (start address, field, and length of buffer programmable). For subsequent calls to WDATA no new data-filename is necessary; WDATA keeps track of the block-numbers. Furthermore, it examines if the buffer length corresponds to an even number of pages, if the sys-space available is sufficient for the next buffer output (if not, a correction will be done of the amount of output together with a correction message), and it asks after a successful buffer-output if you want to transfer any more data. If your output has been ended it will print out the complete filename (with the extension ".EX") and its total block length.

Evaluations of these data having been stored on sys by WDATA can be made in FORTRAN II by means of the program USLIBA (DECUS 8-759).

Minimum Hardware: OS/8 Configuration, at least one terminal and one mass storage device

Other Programs Needed: USLIBA (DECUS 8-759)

Storage Requirement: 3 pages

Restrictions: Minimum transfer unit: 2 pages = one OS/8 block of data; Data buffer should not occupy the USR area in core

Source Language: PAL-8

DECUS NO. 8-762

TTYIO - I/O Routines for Teletype or Similar Terminal

Albrecht Lommel, Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland

This package contains programs necessary for a good communication with the terminal. TYPX prints messages, six bit ASCII.

KREAD reads messages from keyboard, GETBUF prints them out (both use a buffer for the eight bit ASCII characters) as a mere message or forms an octal number of sequential characters. DBCONV converts ASCII-coded decimals to binary numbers, DECPRT prints up to 4 digit decimal numbers of a binary number in AC.

HEAR is a special form of KREAD for a fix text buffer, GETKBD is the corresponding GETBUF for a fix buffer.

The routines require 2 pages of core and can be used field independent via some special routines listed in the comment. They all use the same exit (1 loc. in page Ø). KREAD, TYPS, DBCONV and DECPRT are adaptations from DEC's Commonly Used Utility Routines.

Minimum Hardware: PDP-8/E, KL8E Interface (TTY, LA30 or LA36 interface)

Source Language: PAL III

DECUS NO. 8-763

KL8TST - KL8/E, KL8/J Diagnostic

David A. Bennett, Computer Science Research Laboratory, The Technological Institute, Evanston, Illinois

KL8TST verifies the correct operation of a KL8/E or a KL8/J asynchronous serial device controller. In an environment where a particular board must quickly be isolated as the possible source of some unknown difficulty, or in general when a vote of confidence is needed on a KL8/E or /J irrespective of the peripheral which it controls, this program will give a fast go no/go response.

Should the program discover a fault, it attempts to report its nature in meaningful English language phrases. It will perform independent tests of 1) interrupt capability, 2) punch complete flag operation, 3) keyboard ready flag operation, and 4) data integrity.

Storage Requirement: words 0-663 any field

Source Language: PAL-D, PAL-8

May 1975

DECUS NO. 8-764

LIST

P, C. Diegenbach, Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands

This program gives a listing of an OS/8 file on the Tektronix 4010 terminal with optional hardcopies on the 4020 hardcopy device or on the teletype of DECwriter. Paging after a form feed is switch selectable too. Default extension for the file is .DA. It uses the PS8IN subroutine (DECUS 8-472) (PS8IN is included with the source).

Minimum Hardware:	OS/8 Configuration, Tektronix 4010 Display Terminal
Source Language:	PAL-8

DECUS NO. 8-765

DUMPOS - Dumps OS/8 ASCII Files

Melvyn George Fishel, Free University Brussels, Brussels, Belgium

Program DUMPOS is a very useful dump program in case of system or directory crashes with OS/8 DECtapes. DUMPOS will dump any OS/8 ASCII file on the ASR33, even if the system area or the directory has been destroyed. Block number of file to be dumped is entered manually via the switch register.

Minimum Hardware:	PDP-8/E, ASR33, TD8E DECtape
Other Programs Needed:	OS/8 Operating System
Storage Requirement:	06600-07577
Source Language:	PAL-8, PAL III

DECUS NO. 8-766

SIMBA - A PDP-8/E Oscilloscope Symbol Generator

Melvyn George Fishel, Free University Brussels, Brussels, Belgium

SIMBA is a fast, two-page oscilloscope character generator. A 6X4 dot matrix is used to generate the symbols. The subroutine takes care of full-line, full-page and end-of-file conditions. Tab characters are automatically expanded.

Minimum Hardware:	PDP-8/E, EAE, VC8E, Oscilloscope
Storage Requirement:	2 pages (400_8 words)
Source Language:	PAL-8, PAL III

DECUS NO. 8-787

LISZ - An Extended ISZ Instruction for the PDP-8/L

J. S. B. Clark, Poultry Research Center, Edinburgh, Scotland

The write-up describes a hardware modification to the PDP-8/L which will allow a greater facility for bit manipulation than is possible with the standard instruction set. The modification extends the use of the ISZ instruction. An example shows the application of this LISZ instruction to a polarity-quantized algorithm, with a reduction of between 15% and 50% in execution time.

Hardware Required:	PDP-8/L or 8/I
Source Language:	PAL III, PAL-D
Restrictions, Deficiencies, Problems:	Involves a small hardware modification

DECUS NO. 8-788

Using the RAR RAL Micro-Instruction as an Auxiliary Command

J. S. B. Clark, Poultry Research Centre, Edinburgh, Scotland

The limited instruction set of the PDP-8/L can cause program inefficiency. A modification is described which allows the redundant micro-instruction RAR RAL to be used as a control command. An example of its use in enabling another modified command under program control is given.

Hardware Required:	PDP-8/L or PDP-8/I (unverified)
Source Language:	PAL III, PAL-D
Restrictions, Deficiencies, Problems:	Involves a hardware modification

DECUS NO. 8-789

RKCOPY

MARK D. Himes, Digital Equipment Corporation, Rolling Meadows, Illinois

RKCOPY is designed to facilitate copying entire disk packs between any two disk drives on an RK8E or RKS8E compatible disk system. In addition, verification of data copied is made possible as well as the capability of comparing any two disks for differences in data formats. Minimum core allocation and minimum execution time were the two main factors strived for in this program.

Monitor/Operating System:	Exits to OS/8
Core Storage Required:	0-1777 Field Ø (Field 1=buffer)
Hardware Required:	Console Device (TTY, VT05, LA30, etc.); PDP-8/E, F, M; RK8E or RKS8E
Other Software Required:	RIM, BIN Loaders, or OS/8
Source Language:	PAL-8, V9B
Restrictions, Deficiencies, Problems:	Requires 8K operating area, copies entire disk only (no partial transfers), not tested under COS 300 or other monitors

DECUS NO. 8-790

CHRDIS - Display Alphanumeric Characters on ND-50/50 System

Dipl. Phis. Mircea Pentia, Nuclear Education and Training Center, Bucharest, Romania

This program is an overlay for Physics Analyzer program (ND 40-1042). It is used to write and display the ASCII characters typed to the teletype keyboard, on the scope from the standard Series 50/50 Nuclear Data Analyzer. It is possible to display maximum 256 characters. (32 per line times 8 lines.)

Object Computer:	PDP-8/L
Core Storage Required:	8K
Hardware Required:	Nuclear Data 50/50 Interface System
Other Software Required:	Nuclear Data's Basic Software
Source Language:	PAL III

DECUS NO. 8-791

DELAY

J. Victor Nahigian, 39 Beaver Road, Weston, Massachusetts

When entering a tape via the low-speed reader in 8K BASIC or 8K FOCAL, characters are occasionally dropped. To avoid this, null characters must be inserted after each line in order to allow the computer to catch up. This program performs that function.

Core Storage Required:	4K
Hardware Required:	PDP-8, ASR33
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	Can't be used on high-speed reader or punch

DECUS NO. 8-792

PROVE-8, V.03

A. David Leach, 39 Irvine Drive, Farnborough, Hampshire, England

The art of Campanology, or church-bell ringing in the English manner, uses a traditional form of music based on mathematical rules. One of the rules is that no permutation of the bells may occur more than once in a composition. To prove this by hand can be a long, tedious process.

PROVE can handle compositions of up to 500 leads in any single-hunt method, plain or otherwise, on up to 12 bells.

June 1976

DECUS NO. 8-792 (Continued)

A composition is entered in the standard format on the teletype, and the PDP-8 interrupts to print the details of any repetition.

Core Storage:	4K
Hardware Required:	PDP-8, TTY or equivalent terminal
Other Software Required:	Bin loader
Source Language:	PAL-8

DECUS NO. 8-793

RANF - A Pseudo-Random Number Generator for OS/8 FORTRAN IV

Jonathan Gross, University of Minnesota, Minneapolis, Minnesota

This is a FORTRAN IV random number function that returns a number in the range of Ø to 1. It is based upon the generator by Dunsby and Walker, DECUSCOPE, Vol. 14, Number 3. Also included is a seeding subroutine, RANSET.

Monitor/Operating System:	OS/8
Core Storage Required:	133 octal words
Hardware Required:	EAE
Other Software Required:	FORTRAN IV
Source Language:	RALF

DECUS NO. 8-794

IFAC - A FORTRAN Program for Parameter Estimation

Hans-Dieter Wierum, Institut fuer Kerntechnik
Technische Universitat Berlin, Berlin, Germany

This program consists of four source programs, IFAC, GAUSS, BINOM and PULSAD. The main program IFAC computes matrixes and vectors which are needed for a least squares analysis. The subroutine GAUSS solves a linear equation system, i.e. the matrix equation A.X=Y for X. The elements of the result vector X are the parameters of the discrete transfer function. The subroutine BINOM computes the vector PAR from the vector X. The elements of the vector PAR are the parameters of the continuous transfer function. The data acquisition of the input-and-output - signals is carried out in real time by the subroutine PULSAD.

Monitor/Operating System:	OS/8
Core Storage Required:	12K
Hardware Required:	AXØ 8, ASR-33
Source Language:	FORTRAN II, PAL-8 or PAL III

DECUS NO. 8-795

RINROT: A Roll-in, Roll-out Program

Wayne Teeter and Harold E. Cronin
Naval Weapons Center, China Lake, California

RINROT is a roll-in, roll-out program used to save an RK8E cartridge disk on TM8E 1/2" magtape or restore the disk from the magtape. A starting address of 0200 reads the disk and writes the disk data in 1024 word blocks on the magtape. A starting address of 0400 reads the magtape and writes 256-word blocks on the disk.

Monitor/Operating System:	OS/8
Core Storage Required:	Locations 20-2600
Hardware Required:	RK8E cartridge disk, TM8E magtape
Source Language:	PAL-8

DECUS NO. 8-796

Five Word Floating Point Package for PDP-8

Douglas L. Martin
National Research Council of Canada, Ottawa, Canada

The package operates in the interpretive mode, performing calculations with an accuracy of 14 to 15 significant digits. It includes input and output routines, the latter permitting variable word length fixed and floating point outputs. Input and output are possible within a set of floating point instructions which also include add, substract, multiple, divide, square, square root, normalise, negate and absolute value. The package occupies core areas 5-7, 15, 40-64 and 5463-7543.

Core Storage Required:	5-17, 15, 40-64 and 5463-7543.
Hardware Required:	Input-output device e.g. ASR33 TTY
Source Language:	PAL III
Restriction, Deficiencies, Problems:	Numbers range 10^{-38} to 10^{+38}

DECUS NO. 8-797

LSPCF: Least Squares Polynomial Curve Fitting Program

J. deBoer and Douglas L. Martin
National Research Council of Canada, Ottawa, Canada

The Program uses Bjorck's Modified Gram-Schmidt orthonormalising process. It will least squares fit a power series of up to 17 terms (ranging from power -4 to power 21) to a number of data point pairs exceeding the number of terms in the series but otherwise unrestricted. This is done using a basic 4K-core PDP-8 with no peripherals apart from the ASR33 Teletype but a special

DECUS NO. 8-797 (Continued)

5-word floating point package must be used. The first pass of the data tape produces the power series coefficients. An optional second pass produces the deviations of individual points from the fitted series and the error limits of the coefficients.

Core Storage Required:	0-4377, 4600-5461
Hardware Required:	Input-output device e.g. ASR33 TTY
Other Software Required:	Five Word Flating Point Package (DECUS 8-796)
Source Language:	PAL III
Restriction, Deficiencies, Problems:	Will not accept $x=0$; possible error messages which might be avoided by rescaling data.

DECUS NO. 8-798

OS/8 to RSTS Interface

R. J. Tapp
University of Victoria, Victoria, B.C. Canada

Consists of an OS/8 device handler and a BASIC-PLUS program which make a KL8 serial interface emulate an OS/8 disk when connected to a RSTS terminal port. This allows serial lines from a RSTS system to provide inexpensive supplementary mass storage for satellite OS/8 systems.

Monitor/Operating System:	OS/8 Version 3
Core Storage Required:	1 page (128 words)
Hardware Required:	KL8-J and DL11-C Serial interfaces
Other Software Required:	OS/8, V3
Source Language:	PAL-8

DECUS NO. 8-799

Dose Calculation of Irregular Fields

Pei-nan Tsung, Ph.D.
The Buffalo General Hospital, Buffalo, New York

The dose calculation of irregularly shaped fields for therapy treatment planning using Co-60 and 4MV linac radiation has been accomplished by writing and utilizing a routine digital computer program algorithm.

Monitor/Operating System:	OS/8
Core Storage Required:	12K
Source Language:	FORTRAN II

DECUS NO. 8-800

Heat Loss Calculation

Theodore E. Bridge
54 Williamsburg Drive, Springfield, MA 01108

This program was designed to make a straightforward heat loss calculation very much as you would make one manually. You could make such a manual calculation almost as quickly, but his program will leave a printed record of all parameters used. For checking, a manual calculation must be repeated. The machine calculation can be checked by scanning the output.

Core Storage Required:	4K
Hardware Required:	ASR 33 Console
Source Language:	PAL

DECUS NO. 8-801

MORSE: Morse Code Coder and Decoder

Bruce Filgate
Digital Equipment Corporation, Marlboro, MA

This program was created on a PDP-8, to generate and decode Morse code when executed by the MPS (8008-1). The program can handle code speeds from 7.2 WPM to 80 WPM. Input is via a sense line, output is on a drived line. The Logic Products starter set contains the required CPU configuration. Input decoding is self tracking as to code speed.

Monitor/Operating System:	MPS
Core Storage Required:	1200 decimal location
Hardware Required:	MPS M7341; Terminal, code key
Source Language:	MLA (Module Language Assembler)

DECUS NO. 8-802

SSP: Scientific Subroutine Package

Sandia Labs (IBM) and H. David Todd
Submitted by Robert Hassinger, Liberty Mutual Research Center, Hopkington, MA

The Scientific Subroutine Package (SSP) is a collection of over 250 FORTRAN subroutines divided, for the sake of presentation, into two groups: statistics and mathematics. Also, over 200 subroutines are presented in both single and double precision mode. SSP is a collection of input/output-free computational building blocks that can be combined with a user's input, output or computational routines to meet his needs.

Monitor/Operating System:	OS/8
Core Storage Required:	8K Minimum
Hardware Required:	OS/8 Configuration

DECUS NO. 8-802 (Continued)

Other Software Required:	OS/8 FORTRAN IV
Source Language:	FORTRAN IV

DECUS NO. 8-803

FOLMAT

G. Chase
Portsmouth Abbey School, Portsmouth, Rhode Island

There exists a DEC Program, "FORMAT". It takes a Binary File (.BN) for input and outputs a paper tape which can be loaded and auto-started by the Rim Loader. FOLMAT was created to meet several needs: faster loading; a better binary loader that will reject false codes; the avoidance of high-order bit pick up; a built in readable punch (64-char. set) for the "head"; ability to omit the auto-loader, or to transfer ASCII files.

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	OS/8 configuration
Source Language:	PAL-8

DECUS NO. 8-804

MUSIC: PDP-8 MUSIC PLAYING PROGRAM

Richard Wilson and others
Digital Equipment Corporation, Maynard, MA

MUSIC is a program which will play music in four part harmony on any PDP-8 family core memory computer, except the 8/S or PDP-12. The music to be played is input to the program as a standard OS/8 ASCII file. The music may be picked up by the use of an AM radio, or by a simple interface. The OS/8 distribution media include the source of the player, which can be customized for various configurations, along with approximately 45 minutes of music, such as Joplin, Bach, Beethoven, movie tunes, etc.
The binary paper tape is intended for any 1.5 microsecond PDP-8, and runs in 4K, but will only play short tunes. Several short tunes are available on paper tape.

Core Storage Required:	4K or greater
Hardware Required:	A radio and the device of distribution
Other Software Required:	Binary loader or OS/8
Source Language:	PAL-8

DECUS NO. 8-805

PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and punch

Guy Schayes, University of Louvain, Louvain-la-Neuve, Belgium

DECUS NO. 8-805 (Continued)

This handler is to be used under RTS-8 executive (DEC NO. QF020) and drives the paper tape reader and punch in a manner quite similar to the DEC Terminal Handler task.

Monitor/Operating System:	RTS Executive
Core Storage Required:	2 pages (256 words)
Hardware Required:	PDP-8E with high-speed punch and reader, ASR33
Other Software Required:	RTS-8
Source Language:	PAL-8

DECUS NO. 8-806

SAC8: Simulation of an Analogue Computer

H. - W. Ridder
Radiologiezentrum der Philipps-Universitat, Marburg, Germany

This program computes the solution of maximal 8 simultaneous, first-order, linear, homogenous differential equations with constant coefficients. It simulates an analogue computer with 8 integrators.

Core Storage Required:	4K (8K optional)
Hardware Required:	Teletype or DECwriter LA30
Other Software Required:	Floating Point Package DEC8-5B-S
Source Language:	PAL-D
Restricitions, Deficiencies, Problems:	Program tested on PDP-8S only

DECUS NO. 8-807

UTILITY Routine and Patches for the FORTRAN Compiler

Dr. IR. L. Boullart
Stedelijk Instittuut voor Handel & Secretariaat Gent, Belgium

These patches enable a user with only a low-speed reader/punch to write, compile, load and run FORTRAN-written programs. One of the FORTRAN library programs "UTILITY" has been rewritten to allow use of the low-speed reader/punch at run-time and is included with this offering

Core Storage Required:	8K
Hardware Required:	PDP-8E, 8K, TTY
Other Software Required:	8K FORTRAN Compiler, 8K Sabr Assembler, 8K Linking Loader
Source Language:	PAL-8

DECUS NO. 8-808

Probability Density Functions of Analogue Signals with the LAB-8 System

Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin, Germany

This program will perform the probability density of an analogue x(t).

Hardware Required:	Lab-8 System
Other Software Required:	Floating Point Package, Vers. B (DEC-Ø 8-YQ2B-PB)
Source Language:	PAL-8

DECUS NO. 8-809

FFT or IFFT of an Analogue Signal with the LAB-8 System

Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin, Germany

The FOURIER transform or inverse FOURIER-transform of an analogue signal is calculated.

Core Storage Required:	8K
Hardware Required:	LAB-8 System
Other Software Required:	Floating Point Package, Version B (DEC-Ø8 - YQ2B-PB)
Source Language:	PAL-8

DECUS NO. 8-810

PING: Ping-Pong Game on Display

M. Boniface
Laboratoire de Physique, U.E.R. de Pharmacie, Lille-cedex, France

This program allows the users to play a kind of ping-pong on the display. The rackets (cursors) are set by the levels of analogic channels. The speed of the ball (spot) and its direction vary during the game with the rebound.
Documentation and listing are in French.

Core Storage Required:	4 pages
Hardware Required:	EAE, clock A/D converter, display
Source Language:	PAL III

DECUS NO. 8-811

DYNOD: DYNAMIC OCTAL DEBUGGER

S. M. Morrissey
S.T.C. Capacitor Div., Brixham Road, Paignton, Devon, England

"DYNOD" is a simple ODT, limited to examination and changes to core locations in any field. It was written for an on-line interrupt driven system, for use without stopping the background job. It uses 1 page of core if external I/P and O/P routines are used, approx. 17Ø locns. if self contained.

Core Storage Required:	170 locations
Hardware Required:	PDP-8 ASR33
Source Language:	PAL 8
Restrictions, Deficiencies, Problems	Care must be taken with format of entries.

DECUS NO. 8-812

CASINO: Sykes Cassette Input/Output

M.G. Fishel, R. Vyncke - Author
S. Orloff - submitter
Free University Brussels V.U.B., Brugman University Hospital, Brussels, Belgium

Program CASINO saves core image files of up to 4K on cassettes or reloads saved files from cassette into core, avoiding slow and noisy paper tape handling. Program CASINO resides on one page in core and is fully relocatable. A bootstrap is provided. CASINO was written for a system with the following configuration: PDP8-E, VTØ 5 and SYKES 322Ø.

Core Storage Required:	One page (200 locations), 4K
Hardware Required:	PDP-8E, VTØ 5, Sykes 3000 Series Cassette Unit
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	HIGH SPEED SEARCH OPTION required with cassette unit.

DECUS NO. 8-813

DIGFIL: RECURSIVE DIGITAL FILTER

H. - W. Ridder, K. Meinke

Radiologiezentrum der Philipps-Universitat, 355 Marburg, Germany

This program is written for on or off-line digital filtering. It combines high accuracy by multiple precision computation with convenient decimal input of

DECUS NO. 8-813 (Continued)

filter coefficients. The program may be extended by user written subroutines for data acquistion etc.

Core Storage Required:	4K
Hardware Required:	TTYor DECwriter LA30
Source Language:	PAL-D

DECUS NO. 8-814

PROCES: An Image Processing Program for the PDP-8E

Peter Lemkin and Bruce Shapiro
Image Processing Unit, National Cancer Institute,
National Institutes of Health, Bethesda, Maryland

"PROCES" is a stand-alone PDP-8E program running on the Image Processing Unit's (IPU) "Real Time Picture Processor" (RTPP) which is used to process 256x256 raster scan picture files. It can display a 256x256 raster on a Dicomed Display with 64 levels of gray, print subpictures (up to 72x72) on a teletype or lineprinter, output a processed picture into a picture file, average it, take its laplacian or gradient, and perform picture operations (max, min, +, -, *, /) on two gray scale pictures. In addition, PROCES can find a boundary, mask an image with the boundary, generate a gray scale histogram display or printout, and find the maxima/minima of the gray scale histogram. The IPU uses digitized images of microscopic fields acquired via a galvanometer scanner, but any properly formatted Digital array may serve as "pictures."

Monitor/Operating System:	OS/8, V3
Core Storage Required:	32K
Hardware Required:	EAE required. (LPT:, scanner, display if available, but not required
Source Language:	FORTRAN II/SABR

DECUS NO. 8-815

BINPUN: OS/8 Binary Punch from Core Image Files

Torben Poulsen
Technical University of Denmark, Lyngby, Denmark

BINPUN is used to generate a binary paper tape version of a save program (core image file), and thereby achieve a safety backup copy of the saved program. The binary output from BINPUN contains all necessary codes and can be loaded by means of the ABSLDR program. The saved program to be punched needs not be loaded in core prior to punching as BINPUN read the codes directly from the core image file.
If needed BINPUN is able to merge multiple files into a single binary paper tape.

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	EAE, TTY and/or high speed punch
Source Language:	PAL-8

DECUS NO. 8-816

PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter

Shlomo Z. Ron
New York City Health and Hospital Corp.
New York, New York

This is a package of two independent FORTRAN II subroutines; one for plotting on Tektronix 611 storage scope and the other for plotting on an incremental CALCOMP 563 plotter. The calling format for the two subroutines is basically the same. The subroutines provide for pen up and pen down, best approximation to a straight line, coordinate plotting and plotting of x at desired locations.

Monitor/Operating System:	OS/8
Core Storage Required:	One page for scope and two pages for plotter
Hardware Required:	KV8E and storage scope, incremental plotter
Source Language:	SABR

DECUS NO. 8-817

LABCOL I: Laboratory Control and Automation Language

Donald A. Walter and Kathryn B. Willis
West Virginia College of Graduate Studies, Institute,
West Girginia

LABCOL I is a user oriented language to be used on PDP/8 series computers for control of laboratory devices or other equipment. It is easily used by those familiar with FORTRAN, BASIC, or other computational languages. Commands are easily substituted or added, and it can be readily adapted to various peripheral device configurations. The language has these features: integer arithmetic; decision and branching; subroutines; variable, numerical, array, and literal arguments; nesting and looping; one and two dimensional arrays; and manipulation of symbol lists.
LABCOL I is particularly suited for conducting human and animal research, where experimental decisions must be made based on responses.

Core Storage Required:	4400_8
Hardware Required:	PDP-8E, ASR33, DK8-EC, VC8E, (DR8-EA*)
Other Software Required:	RIM-BIN
Source Language:	PAL III
Restrictions, Deficiencies, Problems:	*Program has been used with user designed 12-bit relay I/O interface. Adaptable to any 12-bit interface configuration.

June 1976

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I. MATHEMATICS

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BASIC8-1	Mathematics - Set 1
BASIC8-2	Mathematics - Set 2
BASIC8-3	Mathematics - Set 3
BASIC8-26	LIB17 - Package of Mathematical Routines
BASIC8-28	Mathematics - Set 4
BASIC8-30	LIB12 - Mathematical and Graphing Routines
BASIC8-31	Mathematics - Set 5
BASIC8-32	Mathematics - Set 6
BASIC8-44	Mathematics - Set 7
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BASIC8-71	CALC

II. PLOTTING

BASIC8-4	Plotting - Set 1
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BASIC8-13	Administrative - Set 1
BASIC8-27	Multiple Choice Quiz
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BASIC8-43	NEOPAL, PAL-D Simulator
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BASIC8-47a	FILE: Text Data File Program for TSS/8 BASIC-4
BASIC8-50	CSHHS BASIC-73
BASIC8-51	DISEDU - Loading EDUsystem-2Ø on the 4K Disk Monitor System
BASIC8-56	Laboratory and Display Instructions for OS/8 BASIC
BASIC8-57	NEEDIT - Symbolic Editor Program for NEOPAL
BASIC8-58	RESEQUENCE
BASIC8-66	CLILAC - LILAC Conversion
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BASIC8-55	101 OS/8 BASIC Computer Games
BASIC8-60	WRDSEK, WRDGES, LIFE, LIFES1, TICTAC
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BASIC8-34	Football Scouting Report Systems
BASIC8-82A	SADSAC
BASIC8-82B	Student Manual for the SAD/7400 Computer and the SAC Compiler
BASIC8-85	BASIC FOOTBALL

PDP-8 PROGRAMS WRITTEN IN BASIC

Most BASIC8 programs consist only of a write-up and listing and are offered at no charge for the first copy and $1.00 for each additional copy. Any tapes offered are indicated after the abstract. Associated service charges are also indicated. Programs may be requested on the regular DECUS Order Form.

BASIC programs for computer lines other than the PDP-8 can be found in the appropriate catalogs.

A list of programs written in BASIC for the PDP-8 and submitted to the DECUS Program Library before the institution of a separate BASIC8 library follows. Abstracts may be found in the PDP-8 section of this catalog.

DECUS NO.	TITLE	COMMENT
8-159	CINET-BASIC	An interpretive compiler
8-195	POLY-BASIC	A compiler and operating stand-alone system
8-331	Roulette	Written in CINET-BASIC
8-332	The Civil War Game	Written in CINET-BASIC
8-346	Pollution Game	
8-361	Game of Chance	
8-394	BASIC MOO	
8-401	Dice Game and TIC-TAC-TOE	
8-406	STATPAC Revisions for PDP-8/I and TSS/8	From Dartmouth BASIC Library
8-426	Prime Number Generator	
8-430	DECK: A Random Deck of Cards	
8-437	Computer Dating Game	
8-447	Roots of a Polynomial by Muller's Method	
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8-463	Perpetual Calendar	
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DECUS PROGRAM LIBRARY
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BASIC8-21	The Monopoly Game	D01, G06
BASIC8-22	BASEBALL	D01, G02
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BASIC8-24	TRAN	D01
BASIC8-25	LABEL	D01, G02
BASIC8-26	LIB17 - Package of Mathematical Routines	D01, G06
BASIC8-27	Multiple Choice Quiz	D01, G02
BASIC8-28	Mathematics Set 4	D01
BASIC8-29	GAMES - Set 3	D01
BASIC8-30	LIB12 - Mathematical and Graphing Routines	D01, G06
BASIC8-31	Mathematics - Set 5	D01

No.	TITLE	MEDIA/PRICE CODES
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BASIC8-33	SEQ; SAME; STAT1	D01
BASIC8-34	Football Scouting Report Systems	D01, G06
BASIC8-35	XYPLOT; 3 DGRAPH, PLOT-1	D01
BASIC8-35.2	3 DGRAPH	G02
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BASIC8-37	Business and Social Studies - Set 3	D01
BASIC8-38	USAGE	D01
BASIC8-39	LILAC:Laband's Ingenous Little Automatic Computer	D01, G02
BASIC8-40	Tutorial Exercises in Chemistry	D01, G02*
BASIC8-41	OMS130 BASIC	A01, B07, F06, H12
BASIC8-42	RECOVE - BASIC Recovery From Crash	D01, G02
BASIC8-43a	NEOPAL, PAL-D Simulator	D01, G06
BASIC8-44	Mathematics Set 7	D01
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BASIC8-53	ACEDUC, TIC-TAC-TOE, Check6C, Onearm	D01, G02*

* Per Routine

No.	TITLE	MEDIA/PRICE CODES
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BASIC8-55	101 OS/8 BASIC Computer Games	A01, B13, G02*, H16
BASIC8-56	Laboratory & Display Instructions for OS/8 BASIC	A01, B07, H12
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BASIC8-59	STORM3	D01
BASIC8-60	WORDSEK, WRDGES, LIFE, LIFES1, TICTAC	D01, G02*
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BASIC8-77	STREK-STAR TREK	D01, G02
BASIC8-78	INDY 500 Survival Tests	D01, G02
BASIC8-79	MIS1 MIS2	D01, G02
BASIC8-80	Geometry Routines,	D01
BASIC8-81	JUMBLE; ONE TWO	D01
BASIC8-82A	SADSAC	D01, G02
BASIC8-82B	Student Manual for BASIC8-82A	E01
BASIC8-83	PLTPKG	D01, G02
BASIC8-84	PLOTTY	D01, G02

* Per Routine

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BASIC8 PROGRAM ABSTRACTS

BASIC8-1
MATHEMATICS - SET 1
Source: Digital Equipment Corporation
Includes:

BASKT - Demonstrates exponential convergence.

BICYCL - Solves simple time-speed-distance problem.

BOOKS - Demonstrates method of improving upon brute force to solve simultaneous equations.

CONVRG - Converges on e and π by three methods.

DRINKR - Solves simple drinking/blood pressure relationships.

GROUP - Demonstrates brute force vs. substitutional solution of simple equations.

PASCAL - Method of generating Pascal's triangle using random numbers.

PROGRS - Solves a number progression problem.

QUADRT - Solves for the roots of a quadratic equation.

ROOTS - Finds the roots of any function between -20 and 20.

SIMUL - Solves simultaneous equations by brute force.

TICKET - Introduces the concept of logical branching.

CRSCNT - Solves for the area of a crescent (not generalized).

LADDER - Solves the slipping ladder program by Pythagorean Theorem.

CAI-ADD - Demonstrates a Computer Assisted Instruction drill and practice routine.

DISTANCE - Calculates distance between points in three-dimensional space.

BASIC8-2
MATHEMATICS - SET 2
Source: Polytechnic Institute of Brooklyn
Includes:

CRVLEN - Computes the length of any curve (analytically defined).

CVAREA - Computes the area under any curve (analytically defined).

GCD - Finds the greatest common divisor of any set of numbers.

LIMSIN - Evaluates the limit of sin x/x as x approaches zero, in both radian and degree measure.

PI2 - Computes the area of a circle using both inscribed and circumscribed regular polygons.

PRIFA - Finds prime factors.

QUADRT2 - Describes the graph of a second degree equation, $Ax^2+Bxy+Cy^2+Dx+Ey+F=0$.

RATIO - Solves for the unknown in a proportion.

ROOTS2 - Finds the real roots of the quadratic equation $ax^2+bx + c = 0$.

SETS - Finds the union and intersection of any two numerical sets.

SIMEQN - Finds solutions to sets of up to ten simultaneous equations.

SLOPE - Computes the tangent slope for any function.

SQRT - Finds the square root of counting numbers up to five decimal places.

STATAL - Calculates the arithmetic mean (average) of a set of numbers.

SURFAR - Computes the area of any surface of revolution.

VOLSOL - Finds the volume of solids of revolution.

ARITH - Multiplication involving one and two digit multipliers.

BASIC8-3
MATHEMATICS - SET 3
Source: Varied
Includes:

ROUNDOFF - F. McPhetres
Rounds off numbers to any number of places.

SETS-1 - CAMP, First Course
Determines the intersection of two sets of numbers.

TUTOR-1 - Walter Koetke
Drill and practice with time-speed-distance.

AREA-1 - Computer Methods in Mathematics
Solves for the area under a curve by equation.

BASIC8-3 (Continued)

FLIP-1 - Basic BASIC
Uses random number generator in BASIC to flip a coin.

EXPON - NREL/SDC
Solves for the exponent in general exponential equations.

CERES1 - DYMAX
Computes and prints the sum of the first n terms of the following series:

$$1-1/2+1/2-1/4+\frac{1}{5}-\frac{1}{6}\sim+(-1)^{k-1}(1/K)+\sim$$

GCD - Adapted from the FOCAL program written by Roger B. Kerchner, Carleton College
Applies the Euclidean algorithm to the problem of finding the greatest common divisor for M and N.

WALK1 - Bill Walker
A generalized plotting routine which prints a graph of an expression given in terms of x.

GAUSS - Philip Sorgen
Uses the Gauss-Jordan Elimination Method to solve N linear equations in N unknowns simultaneously.

ABSVAL - DYMAX
A series of seven programs which compute and print the absolute value of X.

ME EPSILON YOU DELTA - Roger Kerchner
A game designed to help in understanding the limit concept.

SINPLOT - Dennis Lunder
Plots and prints a graph of the sine for function from 0-360 degrees

GOLDBACH - CAMP, First Course
Provides new ways to approach theorem proving using Goldbach's Conjecture.

LINEAR - Frederick Brink
Finds the point where linear systems in 2 or 3 variables intersect.

BASIC8-4
PLOTTING - SET 1
Source: Digital Equipment Corporation
Includes:

DIAMON - Plots on N by N diamond matrix.

PLOTFN - Plots any function.

SINEX - Plots a sine wave.

3DPLOT - Plots any three dimension functions.

NOTE: The following routines are for teletype compatible plotters.

TPLOTU - Utility support routine for TSP-212 plotter.

FPLOTU - Utility support routine for TSP-212 plotter

TPLOT1 - Plots a family of 10 sine curves.

TPLOT2 - Plots random horizontal and vertical lines.

TPLOT3 - Plots connected horizontal and vertical lines similar to Etch-A-Sketch.

TPLOT4 - Plots random length, random direction lines. Looks like electron traces.

TPLOT5 - Polygon designer. Plots any polygon given the external angle and number of sides.

TPLOT6 - Spiral designer. Plots a spiral of any shape given the external angle.

TPLOT7 - Bar chart and point to point graph.

TPLOT8 - Plots characters 1 to 8 at random locations with size proportionate to their value.

TPLOT9 - Plots "3-dimensional" exponential functions.

FPLT10 - Plots any function.

BASIC8-5
PLOTTING - SET 2
Source: Varied
Includes:

PLOTTR - Plots the graph of any function.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-6
PHYSICS - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

BFIELD - A plot routine illustrating the B field about one and two wire currents. (Electricity and Magnetism)

BOHR - Hydrogen line spectrum and energy level diagrams are displayed. (Atomic and Nuclear)

CALOR1 - Calorimetry experiment to determine the heat energy to be supplied (or removed) from each mass to obtain the equilibrium temperature. (Mechanical)

DECAY1 - Radioactive decay is treated qualitatively in a game-type situation.

BASIC8-6 (Continued)

DECAY2 - Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EFIELD - An extension of Coulomb's law. Finds the relative field strength at a distance from a line and plane of charge. (Electricity and Magnetism)

KINERV - Review of kinematics; presents questions concerning the movement of a ball in flight. (Mechanical)

LENSES - Solves lens problems. (Light and Waves)

MASSD - Calculates mass defect.

NEWTN2 - A problematic situation requiring repeated application of Newton's second law. (Mechanics)

PHOTEL - Critical wavelength for photoelectric emission is to be determined in a simulated experiment. (Atomic and Nuclear)

PHOTON - How energy levels are determined from the emission of excited atoms. (Atomic and Nuclear)

PLANK - A photoelectric simulation. Students adjust the retarding potential to determine the wavelength of randomly selected electron emitting X-rays. (Atomic and Nuclear)

PRJTL - Coordinates and speeds are printed for a projectile fired at selected speeds and angles (frictionless). (Mechanical)

REFLCT - Least time principle of light is presented as a challenge involving a game analogy. (Light and Waves)

SLITS - A plot routine permitting further exploration of Young's Double Slit experiment. (Light and Waves)

SNELL - A plot routine to aid in visualizing Snell's law. (Light and Waves)

SPACE - Demonstrates the effects of changing velocity on orbital motion. (Mechanics)

VFIELD - Plots a picture of the relative potential strength in the region surrounding two charges. (Electricity and Magnetism)

VLOCTY - Demonstrates that average velocity (D/T) approaches a limiting value as T O. A graph of D vs. T is plotted for an acceleration of 1 meter/ sec^2. (Mechanics)

WAVES - Plots a graph of a fixed and a variable wave, and the superposition of the waves. (Light and Waves)

BASIC8-7
PHYSICS - SET 2
Source: Varied
Includes:

KINEMA - Digital Equipment Corporation
Tests knowledge of kinematics

PHOTOE - Huntington Computer Project
Demonstrates photo electric effect.

UELEC - J. Martin
Produces tables of electric potential.

NEWTON - Project SOLO
Problems using Newton's second law.

ACCELER - Calculates the time in seconds it takes a vehicle to accelerate from zero to sixty miles per hour given curb weight, brake horsepower at maximum torque, and rear axle ratio.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-8
CHEMISTRY - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

ATWT - Calculates atomic weight from percent abundance of isotopes.

AVOGA - Calculates Avogadro's number.

DECAY1 - Radioactive decay is treated qualitatively in game-type situation.

DECAY2 - Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EMPIR - Calculates empirical formulas.

EQUIL1 and EQUIL2 - Calculates the effects of concentration changes in the equilibrium systems: $2HI\ H_2 + I_2$ and $PCl_5 PCl_3 + Cl_2$.

KINET - Tabulates and graphs equilibrium concentration data.

MASSD - Calculates mass defect.

MOLAR - Calculates molarity from titration data.

PHPOH - Calculates pH, poH and percent dissociation.

PRCNT - Calculates percent composition.

STOICH - Solves mass/mass, mass/volume, and volume/volume problems.

BASIC8-9
CHEMISTRY - SET 2
Source: Varied
Includes:

GASVOL - NREL/SDC/DEC
Calculates and plots gas volumes at various pressures.

NOTE: This set will be expanded as new routines are submitted.

BASIC8-10
BIOLOGY - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

EVOLU/SIMPLIFIED VERSION - Demonstrates evolutionary mutations of pepper moths.

EVOLU - Simulated experiment - The relationship between evolution and natural selection is accomplished by studying a population of mutant moths.

DROS - Game approach to determination of the genetic characteristics of Drosophila.

GAMGN - Review of gametogenesis using diagrams and questions.

MEMBR - Experiment simulation showing the active and passive transport of materials across a membrane.

NZYMC - Simulated experiment - Degree of enzyme reactivity varies as environmental conditions are changed.

NZYM2 - Simulated experiment - Maximum enzyme reactivity is shown as being dependent upon an interaction of environmental conditions.

PHOSYN - Simulated experiment - Photosynthetic production of sugar varies as student varies light intensity or carbon dioxide concentration.

BASIC8-11
EARTH SCIENCE - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

CLIMAT - Practice in identifying climates and climatic patterns.

CLOUDS - Explores problems related to the formation of cumuliform clouds.

WATER1 - A tutorial program which goes through the calculations of a water budget.

WATER2 - Prints a complete water budget.

BASIC8-12
BUSINESS AND SOCIAL STUDIES - SET 1
Source: Varied
Includes:

POPULATION - Gruenberger and Jaffray
Examins population growth of the U. S. and Mexico

BALANC - Polytechnic Institute of Brooklyn
Simulates the effects of the relationship between costs of production and revenues.

BANK - Polytechnic Institute of Brooklyn
Solves financial problems concerning installment buying, long term loans and savings accounts.

CIRFLW - Polytechnic Institute of Brooklyn
Simulates the effect of a change in consumption of the "Circular flow model of goods, services and money."

CONSMP - Polytechnic Institute of Brooklyn
A simulation of economic depression and equilibrium as effects of consumption.

STOCK - Polytechnic Institute of Brooklyn
Simulates the stock market.

PURCHS - Dennis Lunder
Projects the purchasing power of the American dollar from 1970 to 1980 based on a base figure of $1.00 value for the year 1959 and values from 1960 to 1969.

BASIC8-13
ADMINISTRATIVE - SET 1
Source: Polytechnic Institute of Brooklyn
Includes:

AVERG1 - Averages grades, lists value of curve, and adjusts grades.

AVERG2 - Sorts and averages grades.

FREQ - Prints a frequency distribution (bar graph) of grades.

GRADE - Prints a table of grades (in percentages), number of questions missed, and number of questions answered correctly.

ITEM1 - Counts and prints number of times questions are missed.

ITEM2 - Sums item analysis.

STAT - A statistical analysis of laboratory data. (For teachers' use)

STATAL - Calculates the arithmetic mean (average) of a set of numbers.

BASIC8-14
COMPUTER WORKSHOP
Source: Alvin Beal

This workshop is intended to provide the teacher or administrator with a knowledge of creating a list of instructions (a program) for a computer to perform. It is a clear, concise, step-by-step set of instructions which introduce the user to the computer and its functions.

BASIC8-15
BUSINESS AND SOCIAL STUDIES - SET 2
Source: Varied
Includes:

DEPRECIATE - Digital Equipment Corporation
Demonstrates 3 methods of depreciation.

SORT-1 - Digital Equipment Corporation
Sorts a list of numbers.

FIFO - Gregg Accounting, Advanced Course
Demonstrates FIFO inventory.

INDIAN - NREL/SDC
Manhattan Island interest problem.

INT-1 - CAMP, Algebra
Interest compounding given one principal amount.

INT-2 - Huntington Computer Project
Interest compounding with regular deposits.

SORT-2 - Computer Methods in Mathematics
Sorts a list of numbers (2nd method).

TRUINT - David Ahl
Calculates the true annual interest rate charged on an installment load.

COMINT - Steve Kramer
Calculates compound interest on a bank deposit.

BASIC8-16
GAMES - SET 1
Source: Varied
Includes:

GUESS - Walter Koetke
Binary search guessing game vs. the computer.

LUNAR2 - Digital Equipment Corporation
Simulates the landing of a lunar module on the moon.

SLOTS - Anonymous
Simulates a one-armed bandit.

EDBARD - Digital Equipment Corporation
Random poetry writing program.

GAME OF LIFE - A. Christopher Hall; A. E. Sapega
A sort of solitaire game, played on a large grid.

MTCHS
This program simulates the game of 23 matches.

GOMOKU
Simulates the traditional game of the Orient, GOMOKU, on a 7 X 7 board.

AMAZIN - Jack Hauber
This program prints out a different maze every time it is run. User specifies length and width. There is only one path through the maze.

GOLF - Howard Kargman
Simulates a game of golf for 1 to 4 players.

TIC-TAC-TOE - Joseph Salamon
Allows user to play TIC-TAC-TOE with the computer. User should always lose or come to a draw.

SIMULATION BASEBALL - Jeff Moskow; Brad Golden
Allows the user to play a nine inning game of baseball against the computer.

DISTANCE GAME - Tom Adametz
Figures out distance implied by 2 random numbers labeled TIME and SPEED.

NUMBER GAME - Tom Adametz
Computer compares a number from 1-5 with a set of random variables. Winning depends on whether or not chosen number compares with variable.

COINS
Simulates coin tossing game.

RUSSIAN ROULETTE
Simulates the game of Russian Roulette.

BASIC8-17
KRIEGSPIEL
Source: A. Christopher Hall; A. E. Sapega

KRIEGSPIEL is a variation of chess, and is played by the same rules, except that neither opponent can see the other's position. They play on separate boards and there is a judge who tells them if their moves are legal and gives other information regarding the game.
Paper Tapes: $2.00

BASIC8-18
POKER
Source: A. Christopher Hall; A. E. Sapega

In this game the user plays draw poker against the computer.
Paper Tape: $2.00

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BASIC8-19
MISCELLANEOUS - SET 1
Source: Varied
Includes:

INDUC - Digital Equipment Corporation
Determines value of an unknown inductor

RESIST - Computer Methods in Mathematics
Computes equivalent resistance for resistor networks.

A SIMPLE APPROACH TO CYBERNETICS - Roy Atherton
A simple classroom approach to cybernetics based on a version of the ancient game "Two Finger Morra."

CHANGE - Dennis Lunder
Simulates an automatic cash register.

SCIENCE FICTION PLOTS - Reha Gur
Develops random plots to science fiction stories.
Configuration: 8K

BASIC8-20
GAMES - SET 2
Source: Varied
Includes:

BASEBALL GAME SIMULATION - Dave Davidson and Bill Weaver
Simulates a baseball game, keeping track of runners, innings, scores, etc.

HORSE RACE GAME - Tom Adametz
Simulates a race between 5 horses. Initial stake is $500.

PDP-8 500 AUTO RACE GAME - Tom Adametz
Simulates an auto race.

KENO - V. Fazio
Plays the game of KENO on the computer.

YATZEE - Bruce Baker III
Simulates the dice game YATZEE on the computer.

SIMULATION BASEBALL - Jeff Moscow; Revision by Bob Tedford
Simulates a baseball game. Uses OS/8 BASIC

FOOTBALL - Ed Vogel
Plays football with the computer. Allows for both offense and defense.

HORSE RACING - Richard Balekdjian
Race between 7 horses; initial stake $750.

BASIC8-21
THE MONOPOLY GAME
Source: Edward M. Meyer

Plays the Monopoly Game on a TSS/8. Up to 6 players.
Paper Tapes: $8.00

BASIC8-22
BASEBALL
Source: Richard Balekdjian

Plays number of innings specified by user. Offers a variety of strategies.
Paper Tape: $2.00

BASIC8-23
SIMCOM
Source: Dan Gutierrez

A simulated compiler, designed to give the beginning programmer a taste of internal computer applications.
Configuration: 8K PDP-8/E, ASR33
Language: Edusystem-30 BASIC

BASIC8-24
TRAN
Source: Michael A. Radtke

Translates a .BAS file to a .DAT file.. Recognizes integers, real numbers, scientific notation and strings.
Configuration: TSS/8

BASIC8-25
LABEL
Source: Russell Lyons

Punches readable characters on paper tape, using low punch. Can punch all characters from 240 to 336 (ASCII)
Configuration: TSS/8
Language: TSS/8 Extended BASIC
Paper Tape: $2.00

BASIC8-26
LIB17 - Package of Mathematical Routines
Source: Geoffrey Chase

These programs were developed in the process of revising, occasionally correcting and recoding certain Hewlett-Packard programs for use with Edu-20 BASIC. Other programs were added as need arose. Programs include routines for Complex Numbers, Matrices and Determinents, Extended Precision Routines and Utility Routines.
Language: BASIC
Paper Tapes: $8.00

BASIC8-27
Multiple Choice Quiz
Source: Kenneth Lubar

A program for computer assisted instruction applicable to many subjects. It is designed for multiple choice testing. Answer feed-back is included and testing statistics are available to the instructor only.
Configuration: 4K TSS-8
Language: BASIC
Paper Tapes: $2.00

BASIC8-28
Mathematics - Set 4
Source: Varied
Includes:

WKSHT1 - Generates factoring trinomials or mult. of binomial worksheets.

WKSHT2 - Generates worksheets for solving equations of the form AX+B=CX+D, where X is an integer.

LISSAJOUS FIGURES - Plots the graph of two time-dependent sinusoidal functions, one in X and one in Y, on a single Cartesian coordinate system.

TRIAD - Will determine the numerical values for the corresponding parts of triangle ABC.

POLFAC (Polynomial Factoring) - Will find the integral and/or rational zeroes of any sixth degree polynomial or less where the first and last terms' coefficients are integers.

BASIC8-29
Games - Set 3
Source: Varied
Includes:

LEM - Simulates a landing on the moon.

LETTER - Prints words on a local (slow-speed) paper tape punch.

OVERKILL - Overelimination of population by input of correct data.

BINGO - Generates up to 300 BINGO cards

TIME - Serves as a sidereal clock for the year 1973.

BASIC8-30
LIB12 - Mathematical and Graphing Routines
Source: Geoffrey Chase

A series of twelve programs written on 8K - 2 user Edu-20. Routines include:

UNFLOT - The user inputs, in octal form, three 12-bit (4-digit) numbers representing the high, middle and low words of the floating AC; the program returns with the equivalent decimal value.

PERFCT - A fast program for finding perfect numbers up to 12 digits of precision.

SORTS - Actually 3 programs: (1) TREES - a binary tree (heap) sort; (2) TOP1 - a fast version of the "top" sort; (3) TOP2 - slower, but it remembers the input order.

CALEND - Prints a calendar for the current year. User inputs year (1969 or later).

POLY - Brute force polynomial search and reduction; user information and control are maximized. If and when quadratic level is reached, both roots (real or imaginary or complex) are calculated and printed.

CUBIC - G. Ruth's general solution of the quartic is in DECUS NO. FOCAL8-263. This program handles only cubics and quadratics, but allows for possible upward expansion by the user.

FRCADD - Adds fractions as fractions, finding L.C.D. and reducing answers to lowest terms. Written primarily for Edu-20/25, since these allow direct fractional input.

REPTER - A string of up to 6 digits, specified as repeating (9.0 repeating means 9.0909090....) or terminating (9.0 terminating is just 9) is converted to a proper or improper fraction reduced to lowest terms.

SINCOS - Graphs sine & cosine curves, with some attention to speed in execution.

ELLHYP - Tangent ellipse/hyperbola, with asymptotes of the latter.

POINTS - A series of graphs, on increasingly larger scales, of the hyperbolic curves of addition and cancellation of radiation from 2 point sources.

HARMON - A series of curves successively approximating a sawtooth or a square wave (user choice).

Language: BASIC
Paper Tapes: $8.00

BASIC8-31
Mathematics - Set 5
Source: Walter Koetke
Includes:

STNDEV - Calculates the mean, biased and unbiased variance, biased and unbiased standard deviation and standard error for one set of numbers.

PRIME - Determines if number N is a prime number.

TABLE - Table of values of sine and cosine function from 0 to 90.

PERMS - Prints all permutations of N letters.

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BASIC8-31 (Continued)

DIVIDE - A simple exercise in division.

DERIV - Figures an approximation to the derivative.

CONTOURS - Demonstrates the level curves (contours) of a function of two variables.

MAX - Finds the maximum value of a function of an interval.

CHINES - Solves N simultaneous congruences of the form: A*X congruent to B (MOD M).

EUCLID - Finds the greatest common divisor of two integers, together with the weighting factors by which the GCD is expressionable as a linear combination.

SIEVE - Demonstrates the sieve method of finding primes.

FRSQRS - Writes positive integers as the sum of 4 squares.

INSCRB - Prints first ten Pythagorian triangles and the radius of the inscribed circle of each.

FACTAP - Computes factorials by Stirling's formula.

EASYØ2 - Lists factors for given number N.

FACTRL - Computes the sum of the first N factorials.

SPHERE - Relationship of surface area, radius and volume of spheres.

BASIC8-32
Mathematics - Set 6
Source: Varied
Includes:

QTABLE - Produces a table of values for all algebraic and many rational functions.

CORREL - Calculates coefficient of linear correlation based on pairs of data supplied by the user.

INTEGR - Approximates a definite integral by using a Riemann sum for a user supplied function.

QUADEQ - Will solve any quadratic equations in the form: $ax^2 + bx + C = 0$.

SIGDIG - Raises any integer to any other integer and prints all significant digits.

EQUA - Shows the step-by-step solution to an equation of the form AX+B=CX+D.

SIMEQ2 - Solves any system of two linear equations in two unknowns.

SIMEQ3 - Solves any system of three linear equations in three unknows.

BASIC8-33
SEQ; SAME; STAT1
Source: Varied
Includes:

SEQ - Gives alphabetic sequence and asks for next letter.

SAME - Exercise in which student finds synonym for given word.

STAT1 - Accepts a minimum of 100 data values and will calculate minimum and maximum values, range, arithmetic mean, median, sample and population standard deviations.

BASIC8-34
Football Scouting Report Systems
Source: Harold L. Singer

Two systems for analyzing football scouting information are described. Results of each play are coded on special mark sense cards and the game is exhaustively analyzed by a series of chained EDU-30 BASIC language programs. Actual use by our coaching staff has produced a time savings of from 18 to 30 coaching man hours per week.

Those not having a CM-8E mark sense card reader but equipment capable of running EDU-30 BASIC or OMSI-BASIC can easily code the play information on paper tape using the TTY.

Either of the two described systems can be used unchanged if your coaches can adapt to the notation system used. If they cannot, these systems should prove excellent guides for producing a tailor made system to your coach's specifications.

Configuration: EDU-30 or OS-8 with OMSI-BASIC preferably with CM-8E mark sense card reader
Language: EDU-30 BASIC
Paper Tapes: $8.00

BASIC8-35
XYPLOT; 3DGRAPH; PLOT-1
Source: Varied
Includes:

XYPLOT - Will plot single-valued functions of X, with X on the vertical axis.

3DGRAPH - Graphs functions of 2 variables. Each graph will be plotted 3 times.
Tape available for $2.00. Order BASIC8-35-2

PLOT-1 - Plots integral values on a teletype terminal. No listing.
Tape available for $2.00 Order BASIC8-35-3

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BASIC8-36
LODICE
Source: David Martin

Simulates rolls of one fair die and one loaded die. Students are to determine, by chi-square analysis, which is which

BASIC8-37
Business and Social Studies - Set 3
Source: Varied
Includes:

AMOR - Computes monthly interest on a loan, given term and interest rates.

PAYRL - Computes and prints the payroll for a small company.

CPI - An economics project to calculate the CPI of a given year.

SALES - Computes and prints the weekly sales for each salesman.

BANKER - Tests student's understanding of different methods of compounding interest.

BASIC8-38
USAGE
Source: Dave Liebschen

Tabulates usage of the computer system. Uses Edu-system 25 BASIC.

BASIC8-39
LILAC: Laband's Ingeneous Little Automatic Computer
Source: Keith Laband

LILAC is a hypothetical machine language written in Edusystem-30 BASIC for a P DP-8 series computer. The program itself is supposed to simulate a real computer's machine language. It contains quite a few instructions that can be found in real assembly languages, but modified in form to fit the needs of this simulator. It also has a few other instructions not found in assembly languages.

Due to the size of the actual program, (on a 4K PDP-8) you are limited to only 175 lines of machine language programming. If you are using a larger BASIC, you can easily modify the program for more programming text.

Since this program simulates many of the steps in learning a real computer's machine language (i.e. the loading and operation of programs) it should be extremely useful to a beginner in machine language programming.
Paper Tape: $2.00

BASIC8-40
Tutorial Exercises in Chemistry
Source: Paul Couchon

Teacher's Guide and Student Workbook are available from DEC's Software Distribution Center for $2.75 and $1.00 respectively. Paper tape for each routine is available from DECUS as indicated below. Please order tapes by Roman numeral (i.e. BASIC8-40, tape I, V, VII, etc.).

I. METEST - Practice in the metric system units for measuring length, mass and volume. Consists of a sequence of multiple choice conversion problems that utilize the units most frequently encountered in science courses
Paper Tape: $2.00

II. DENSITY - This exercise deals with the concept of density. Five different problems are presented, involving the relationships between the fundamental physical qualities of mass, volume and density. Each problem requires some application of the formula:

$$\text{DENSITY} = \frac{\text{MASS}}{\text{VOLUME}}$$

Paper Tape: $2.00

III. ELECTRONS - Drill in identifying the number of electrons having principal quantum numbers 1, 2, 3, or 4 in elements with atomic numbers from 1 - 22.
Paper Tape: $2.00

IV. ATOM - Problem giving the atomic number of an element which lies between LITHIUM and TITANIUM on the periodic table. Student required to describe structure of this atom regarding the number protons, neutrons and electrons in various s and p orbitals.
Paper Tape: $2.00

V. PERIOD - Exercise giving the student practice in using the periodic table and applying the Periodic Law. Questions require an understanding of the relationships which exist between elements and their position in the periodic table.
Paper Tape: $2.00

VI. COMPOS - Quantitative relationships between the elements that compose simple binary compounds. Compound selected at random from 42 possible combinations of six anions and seven cations. Questions asked concerning percent composition and relative number of grams and moles.
Paper Tape: $2.00

VII. EQUATI - Quantitative relationships in chemical reactions, stoichiometry. Students are provided with six balanced equations and must answer a sequence of questions concerning quantitative relationships between substances in three of the reactions.
Paper Tape: $2.00

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BASIC8-40 (Continued)

VIII. RAOULT - Practice in solving problems which deal with the concentration of a solution and its freezing point, and the determination of molecular weight.
Paper Tape: $2.00

IX MOLAR - Relationship between the moles and grams of a solute and the volume and molarity of the solution.
Paper Tape: $2.00

X. GASLAW - Relationships between temperature, pressure and volume of ideal gases. Practice in applying Boyle's Law, Charlie's Law and the Combined Gas Law.
Paper Tape: $2.00

BASIC8-41
OMSI30 BASIC
Source: Barry Smith

A version of DEC's EDUsystem-30 BASIC (including all features) operating under the PS-8 and OS-8 systems. The system uses 8K, instead of 4K - offering significantly larger programs and more variables. Compilation speed is also greatly increased.
Paper Tape: Binary $2.00, ASCII $8.00; Listing: $10.00; DECtape: User Supplied $8.00, DECUS Supplied $20.00

BASIC8-42
RECOVE - BASIC RECOVERY FROM CRASH
Source: James Puccio

This program will allow the TSS/8 BASIC programmer to recover from system crashes and user-induced halts of BASIC. If the user is on a system that has two versions of BASIC, one simple BASIC and one extended BASIC, the program also allows selection of which processor to link to.
Paper Tape: $2.00

BASIC8-43a
NEOPLA, PAL-D SIMULATOR
Source: Christopher A. Kryzan

NEOPAL was designed to provide students with a means of working in assembly language while still in BASIC. This also facilitates BATCH running of programs in assembly language assigned by the teacher. Output is in three passes: the first being a listing of the program as read in (in the form of data); the second being the actual execution of the program; and the third being a listing of the program after execution, (or core dump, if you will) as well as the status of the link and accumulator. Numbers are in base ten form, with 2048 equal to -2048, and 4095 equal to -1, etc.
Paper Tape: $8.00

BASIC8-44
MATHEMATICS, SET 7
Source: Varied
Includes:

TUTOR - A drill and practice program designed to develop a student's skills in mathematical processes. Allows a specific area to be chosen, gives number of correct answers and percentage score. Runs under TSS/8 BASIC.

SIMEQ3 - Solves N simultaneous equations using the addition method.

PYTH - Generates sets of whole Pythagorean triples. It neither repeats nor prints multiples.

Paper Tapes: TUTOR $2.00; SIMEQ3 $2.00

BASIC8-45
LIB9: Extended Precision Routines for BASIC
Source: G. Chase

TAPE "A"

1. "LARG2", add or multiply 2 extended-precision integers. A subset of H.-P.'s "L(A)RGNUM" program.

2. "COLUMN," adds an arbitrary number (up to about 999) of extended-precision integers all at once, in a column, so to speak.

3. "EXSUB," subtracts one extended-precision integer from another. Handles negative answers correctly.

4. "EXDIV," swipes an algorithm from Knuth (V. 2) to allow division of an extended-precision dividend by an extended-precision divisor. Both quotient and remainder are printed in full precision (all digits).

TAPE "B"

5. "FACFAC," from Knuth (V. 1) is a remarkably simple program which lists the prime factors and their multiplicity (power) for the factorial of any single-precision integer typed by the user. In addition, a modified Stirling approximation is given of NAT. LOG (N!), COMMON LOG (N!), and of N! . Values of N! over 10 ↑ 38 cause no overflow.

6. "DEC10," extended-precision decimal integer converted to its extended precision octal equivalent.

7. "DECFO," single precision A/B fraction *OR* extended-precision Ø.12345... String converted into extended-precision octal string.

8 "OCIDEC," the inverse of #6: octal integer to decimal. Extended precision, input and output.

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BASIC8-45 (Continued)

9. "OCFDEC," the inverse of #7: octal fraction or octal string (Ø.12345...) converted to decimal string. Extended precision.

WARNING: #7 - especially - and #9 in A/B input mode are quite capable of generating infinite answers.

Paper Tapes: "A" $2.00; "B" $2.00

BASIC8-46
HORSE - TSS/8 HORSERACING PROGRAM
Source: Ed Vogel

This horse race program includes betting, odds, and names for the horses. Its format is different than most other horse racing programs. Written in EDU-system 5Ø BASIC, can be translated to other BASICS. Size is 5 TSS-8 disk segments.
Paper Tape: $2.00

BASIC8-47
FILE: Text Data File Program for TSS/8 BASIC-4
Source: David Dodell

This program creates a BASIC data file and allows the changing, inserting, and addition of numeric and alpha strings of data. A printout can be made in the beginning or end of the program. Deletion of data file available.

Limitations: Will work only with TSS/8 BASIC with data file capability. If disk is full program will not run because data files cannot be created.

Size: 4 TSS/8 Disk Segments
Paper Tape: $2.00

BASIC8-48
STF and STM, Stellar Formation and Stellar Model
Source: Robert Schaffer

Two BASIC programs are provided which can be applied to studies of stellar evolution and nuclear physics. STF is used to simulate the birth of any star, given certain parameters. At the same time, it tests the possibility of stellar contraction and the start of fusion. If fusion becomes possible, STF considers the condensation a star, and it halts. If condensation proves impossible, then no simulation of birth is given - STF halts. The second program, STM, is composed of several sub-programs which represent data concerning a given star. These sub-programs make it possible to compute a sun-relative model for any star, plot an H-R Diagram, plot the Mass to Luminosity ratio, or estimate the radius of a star.

These programs are more applicable to CAI than actual scientific studies, due to a simplified view of the processes involved.

Write-up contains listings. No tapes.

BASIC8-49
GASSER
Source: Kent Springer

This program solves problems involving the Ideal Gas Law equation for any of the four variables in the equation. It will accept temperature in degrees Farenheit, Centigrade, or Kelvin, pressure in P. S. I., atmospheres, or mm of mercury, and volume in liters or milliliters.
Language: EDU20/25 BASIC
Paper Tape: $2.00

BASIC8-50
CSHHS BASIC-73
Source: "PK" Kretzman, George Roukis

CSHHS BASIC-73 is a language patterned after, and in fact, consisting of numerous modifications to DECUS No. 8-195, POLY BASIC. Extensive rebuilding of both the compiler and editing sections have given the language enormous scope and increased power. Nevertheless, almost complete upward compatability has been maintained between POLY BASIC and CSHHS BASIC-73. Features include:

1) Computed GO TO, 2) Extended function definitions, 3) Data repointer, 4) Line search feature, 5) 'Tab' function, 6) Improved text handling, 7) Correction of all known POLY BASIC bugs, and many others.
Paper Tapes: Loader for CSHHS BASIC-73 - Binary $2.00; CSHHS BASIC-73 Object (Special format) $8.00

BASIC8-51
DISEDU - Loading EDUsystem-2Ø on the 4K Disk Monitor System
Source: Jeff Nisler

This program enables the user to load and save EDUsystem 2Ø on the 4K disk/DECtape monitor system.
Source Language: PAL III
Paper Tapes: Binary $2.00; ASCII $2.00

BASIC8-52
APPLE, POSTER, SIGNS
Source: Christopher A. Kryzan, Malcolm Slaney

1. APPLE enables the user to create poster-sized messages by simply typing in the message he wishes to have printed. The program uses a basic 5 by 7 matrix for character formation, with the smallest enlargement ratio, 1, producing a character about 1 1/2" square. The message can be enlarged anywhere from 1 to 9 times, with the maximum enlargement ratio producing a letter height about 7 1/2" to 8" high. The message can be printed out using a single character, or with the characters being used corresponding to the enlarged character being printed.

BASIC8-52 (Continued)

2. POSTER enables the user to produce posters with enlarged characters or figures inputted by the user. POSTER is actually a modified version of Christopher Kryzan's APPLE and is alike APPLY in every way, except that the user is able to design his own characters. This allows for more versatility in character production than APPLE. Messages up to 50 characters may be used (more on larger systems).

3. SIGNS prints signs on a standard 72 space wide teletype. It will print signs anywhere from ten characters to 72 characters wide. It will also start the sign where desired or will automatically self-center according to input. Another major feature is that you can specify whether it is to print black letters on a plain background or a white character on a black background.

Paper Tapes: $2.00 per routine

BASIC8-53
ACEDUC, TICTACTOE, CHECK6C, ONEARM
Source: Edward J. Quigley

1. ACEDUC2, written in, and run under, a three-user configuration Edusystem-20, allows up to six people to play the game of Aceyducey at the same time, with the computer keeping track of each player's money, wins, losses, etc. The computer will also tell the player the odds he faces before he places his wagers.

This program also offers a good example of print-out control.

2. TICTACTOE plays against a human opponent. The program is intentionally beatable. Playing a program that cannot be beaten is very boring. It is not easy to beat the machine, but it can be beaten.

This game runs on a PDP-8/L running a standard Edusystem-20, with a three-user configuration.

3. CHECK6C plays a fair game of checkers against a human opponent. The program will play at the level of a very good amateur. It is usually beaten by a quality opponent, but fares very well against novices and other programs. Full directions are included in the write-up.

CHECK6C runs on an 8K PDP-8/L running Edusystem-20 with a three-user configuration.

4. ONEARM, written in Edusystem-20 BASIC, simulates playing a slot machine. The program allows variable payoff odds, six different fruits (double payoff if you get three boysenberries), and allows the player to carry his winnings or loses from one game to the next, should he care to. The bank breaks at 1000 dollars, and the player is broken at 1000 dollars lost.

The program will run on an 8K PDP-8/L with a three-user configuration.

Source Language: Edusystem-20 BASIC
Paper Tapes: $2.00 per routine

BASIC8-54
NLYSIS, POSTER2, CLNDR5, PIDART
Source: Edward J. Quigley

1. NLYSIS is a program that 'analyzes' hand-writing. The signature is put on any data input form (card/paper tape) and the program then goes to work on it.

NLYSIS HAS NO BASIS IN ACTUAL HAND-WRITING ANALYSIS.

The program is a good example of how the computer's reputation as a "superbrain" can be used to fool the uninitiated.

2. POSTER2 prints out messages in large block letters, 5 lines by 5 spaces, in several rows, each row printed across the page, rather than down the length of the page.

3. CLNDR5 will print out, in 2 columns down the page, a calender for any given year from 1800 to 2300 A.D.

CLNDR5, with no changes, will run on an 8K Edusystem-20 with three users. When abbreviated (through the use of three-letter commands) the program will run on a four user system.

4. PIDART utilizes the random number generator to approximate pi.

These programs will run on a PDP-8/L with 8K and Edusystem-20 BASIC.

Paper Tapes: $2.00 per routine

BASIC8-55
101 OS/8 BASIC COMPUTER GAMES
Source: Various - Original compilation by David Ahl. Revised for OS/8 by Kay Fisher, Digital Equipment Corporation, Maynard, Massachusetts

The original 101 Games, compiled by David Ahl for RSTS-11 BASIC-PLUS, have been revised to run under OS/8 BASIC.

A list of all games offered is included with the write-up. (Numbers can be found in write-up.)

Paper Tapes: $2.00 per routine
2 OS/8 DECtapes: $16.00 User Supplied, $40.00 DECUS Supplied
Listing: $25.00

BASIC8-56
Laboratory and Display Instructions for OS/8 BASIC
Source: Ronald Jones, Ph.D.

This program is a set of user-defined functions for OS/8 BASIC. It is combined with the LAB/8E functions (DEC-8E-ALOSA-A-LA) to build the file BASIC.UF; a run-time overlay for OS/8 BASIC. These functions control DEC analog and Digital input and output devices and the VC8E display-control. They permit real-time data sampling, with background display, and control of both the X and Y coordinates for CRT plotting.

Language: PAL-8
Object, source, documentation and listing files on one DECtape: $8.00 User Supplied, $20.00 DECUS Supplied.
Hard copy listing: $10.00

BASIC8-57
NEEDIT, Symbolic Editor Program for NEOPAL
Source: Christopher Kryzan

NEEDIT was designed to provide an on-line editing feature for NEOPAL. Through the use of this program, one can construct a program in NEOPAL assembly language and correct errors in programming and in typing which may be encountered. When a program is completed, the finished program will be executed by chaining to NEOPAL (BASIC8-43).

Mass storage is required.

Paper Tape: $2.00

BASIC8-58
RESEQUENCE (A revision of DECUS8-402)
Original Source: Howard Wolfington
Revised by: Timothy M. Sigmon

This is a revision of DECUS 8-402 which resequences line numbers and references within a BASIC program on TSS/8. It has been revised to handle the following TSS/8 extended BASIC options: 'OPEN-ELSE,' 'ON-GOTO,' 'PUT,' and 'GET' statements and the backslash option.

Language: PAL-D

BASIC8-59
STORM3
Source: Bradford A. Morse

This is a program written in BASIC on Edusystem-20, to simulate formations of clouds, rain storms, and the breakup of the clouds after the rain. It requires only that you can type it into the computer (PDP-8/E), and type the word "RUN ". It will take it from there. The program works entirely with random numbers and simulates buildups and breakdowns of clouds by printing progress reports by the hour until the storm is over. After the storm a complete description of the storm's actions are printed out.

BASIC8-60
WORDSEK, WRDGES, LIFE, LIFES1, TICTAC
Source: Christopher Kryzan, Gordon Speer

1. WRDSEK, given the words to be used, will construct a 15 by 15 word search puzzle. The computer will use the number of words you specify, place them in the puzzle at random locations and in random directions, and then print out a word list, solution, and the puzzle.

2. WRDGES will play 'guess the word' with the user. The user will be able to determine the word size (up to 50 characters) and the time in which he has to look at the word. The computer will then generate the word, let the user look at it for the given amount of time, then totally eradicate the word, and ask him what it was.

3. LIFE is a computerized demonstration of Conway's Game of Life as found in Scientific American. This program illustrates the mathematical patterns which result as the organisms on the grid grow and die. Random or determined starting positions of organisms may be used, and the program terminates itself when it has reached an equilibrium.

4. LIFES1 is another version of Conway's 'LIFE.' It works with teletype output.

The population occupies a grid up to 35 wide by 60 long. Excess height is automatically trimmed to save paper. Changes in the population are counted and the run stops automatically when the population reaches a stable pattern.

5. TICTAC will play the game of tic tac toe against the user, trying to pick the move which is most advantageous to the computer. If the operator makes the first move, the computer will play defensively. If the computer makes the first move, it will play offensively. The board is printed out after the computer's move.

Paper Tapes: $2.00 per routine

BASIC8-61
Bowling League Tabulator
Source: Philip Bujalski

This program automates the tabulation of a bowling league for any amount of teams with any amount of bowlers on the teams. For each bowler, total pinfall, total games, average, high game, low game and high triple are calculated.

Paper Tape: $2.00

BASIC8-62
NANCY.BA
Source: Peter W. Dowrick

This program, written in OS/8 BASIC, simulates the playing of tic tac toe, with randomization of differing strategies and blunders, at four different levels of probability.

Paper Tape: $2.00

BASIC8-63
MAMII and MAMID
Source: F. G. McIntosh

"MAMII" - input version, "MAMID" - data version. The programs provide the functions of addition, multiplication and inversion using either 'input' statements of 'read' and 'data' statements. Both programs allow retention of solutions so that 'chain-type' calculations may be performed. Real matrices only.

Paper Tape: $2.00

BASIC8-64
NAMES
Source: Malcolm Slaney

This is a simple program to punch out names and other messages on tape. Messages of any size that can be handled by the LINPUT command will be punched. It is also possible to specify whether the letter or the background should be punched. All alpha-numeric characters can be punched, and new characters, such as Christmas trees, are easy to add.

Paper Tape: $2.00

BASIC8-65
Butler Area School District Computer Mathematics Series
Source: Keith Henry, John Koehring, Albert Stewart

A series of mathematics programs for individual testing on math problems at various levels. Provisions are made for alternative questions for "retakes" at each level. Complementary programs allow for printout of sets of problems on spirit ditto masters and for the teacher to get an answer sheet for the ditto handout. An achievement ideograph program gives explicit student achievement records.

Language: TSS/8 BASIC
Documentation: $1.00
DTA $8.00 User Supplied, $20.00 DECUS Supplied

BASIC8-66
CLILAC, LILAC Conversion
Source: Brett Fleisch

This version of LILAC (BASIC8-39) retains all the original commands, but is modified for EDU-25 BASIC. The number of lines has been reduced due to the occasional usage of the SHIFT/L command. Its highest line number is less than 2046. Also, two additional useful commands have been added.

Minimum Hardware: 8K PDP-8/E, TTY
Language: EDU-25 BASIC
Paper Tape: $2.00

BASIC8-67
TSSTLK - BASIC Language Communications Package for the TSS/8
Source: Reed Christiansen

TSSTLK utilizes a data file, TSSTKF, to transmit and receive messages to and from other terminals.

BASIC8-68
BASIC Storage
Source: Sandra A. Howell

BASIC Storage is a program written in the 8K BASIC language to accept an integer from the teletype and convert it to its 27 bit floating point equivalent. The integer is restricted to numbers between E ± 38 and can be input as integers, decimal integers, or integers expressed in E format. The output is the octal of words 1, 2, and 3 respectively, in the floating point accumulator.

Language: 8K BASIC

BASIC8-69
CHESS
Source: Andy Kent

Allows two people to play a game of chess using a computer as a board and a move recorder. The computer does not check for illegal moves. When the game is over, the computer prints the final position and every move for both white and black that was made.

Minimum Hardware: PDP-8/M and TTY
Other Programs Needed: EDU-25
Storage Requirement: 12K
Language: BASIC
Paper Tape: $2.00

BASIC8-70
PISTOL - Practically Instantaneous Scheduling Typed On-Line
Source: Andrew R. Bradbury

PISTOL is a BASIC source program devised to rapidly produce student schedules for various uses. It was originally designed to schedule student usage of a computer terminal, but may be used for many other scheduling problems.

Minimum Hardware: TSS/8, Disk storage (Could be modified to use DECtape)
Other Programs Needed: BASIC with data file capabilities
Language: BASIC
Paper Tape $2.00

BASIC8-71
CALC
Source: Jesse Heines

CALC allows you to input any valid BASIC numerical expression and prints out the value of that expression on a CLASSIC or OS/8 system.

This program uses one BASIC language program to write another, CHAINs to a newly written program, and then CHAINs back to the original one.

Paper Tape: $2.00

BASIC8-72
Great Circle Course and Distance
Source: G. Brent Dalrymple

This program computes the great circle distance, the initial course angle, and the initial great circle course from the latitude and longitude of the points of departure and destination.

Minimum Hardware: 8K PDP-8, DECtape, keyboard terminal
Other Programs Needed: OS/8
Language: OS/8 BASIC (Version 3.0)
Paper Tape: $2.00

6. SURPLT (Surface Plotter) attempts to plot a "bird's eye view" of a surface defined by a function of the form Z = f(X,Y). The graph somewhat resembles a topological map, where the letters used in the graph indicate the relative "height" of the range. The output is not printed in three-dimensional perspective.

Hardware Required: PDP-8/E, TTY
Other Software Required: EDUsystem 20 (1973) single user
Source Language: EDUsystem 20 BASIC
Paper Tape: $2.00
Write-up: $1.00 (when ordered without tapes)

BASIC8-84

PLOTTY - A Program to Plot a Function On a Teletype
Source: Jorge Paloschi, Argentina

This program plots through a teletype any one variable function, printing the axis if they are within the plotting domain.

It allows the user to choose the graph scale and also to apply a function to the ordinates (as to get semilogarithmic graphs, for example).

The program was designed to minimize the graph printing time.

Core Storage Required: 8K
Hardware Required: PDP-8 and TTY
Other Software Required: 8K BASIC Interpreter
Source Language: 8K BASIC
Paper Tape: $2.00

BASIC8-85

BASIC FOOTBALL

C. R. Desper
Army Materials and Mechanics Research Center,
Watertown, MA

The program matches the operator against the computer in a simulated football game, running under BASIC-8. The offensive team may select from six plays, plus punt and field goal attempt, while the defense is chosen from four patterns, plus attempted block of kicks. Play is timed against a software "clock"; each side is allowed three "time outs" per half. The duration of the game is four quarters, with additional periods in the event of a tie score. Actual time for a game averages 40-60 minutes.

Core Storage Reauired: 8K
Paper Tape: $2.00

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
FOCAL8-301	U/W FOCAL
FOCAL8-313	EAE Patches to FOCAL
FOCAL8-319	FOCLAB - A Language for Computer Controlled Psychology Research
FOCAL8-325	FWNO - FOCAL WRITE NULLS OVERLAY

II. TEXT EDITING, TEXT MANIPULATION

FOCAL8-311	SIXPAC

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

FOCAL 8-2	XOD Modification For Use with Focal
FOCAL8-269	FX Function for Random Access Files
FOCAL8-293	Laboratory & Real Time Patch with FNEW FOCAL
FOCAL8-329	FOCAL Generates Binary

IV. BINARY LOADING, BINARY PUNCHING

FOCAL8-98	FOCAL Punch Overlay
FOCAL8-215	FOCAL 1969 OCTYL Loader
FOCAL8-219	Keyboard controlled High Speed Punch Routine
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69
FOCAL8-272	Punched Paper Tape Generator with Automatic Randomization
FOCAL8-289	TTY Pun-FOCAL Patch

DECUS NO.	TITLE
FOCAL8-293	Laboratory & Real Time Patch with FNEW FOCAL
FOCAL8-329	FOCAL Generates Binary

V. DUPLICATION, VERIFICATION

DECUS NO.	TITLE

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

FOCAL8-309	DBCONV, Decimal-Binary Converter
FOCAL8-313	EAE Patches to FOCAL
FOCAL8-320	WALLIS and INTCAL

VII. UTILITY

FOCAL8-312	CVFCPTG (Centronics Vertical Format Control Paper Tape Generator
FOCAL8-325	FWNO - FOCAL WRITE NULLS OVERLAY
FOCAL8-329	FOCAL Generates Binary

VIII. DISPLAY

FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971

IX. DATA MANAGEMENT, SYMBOL MANIPULATION SORTING

DECUS NO.	TITLE
FOCAL8-7	Strip FOCAL-Storage of Data Arrays
FOCAL8-180	FOCAL-SORT
FOCAL8-210	Chain and FCOM
FOCAL8-234	Action Indicator Calculator

X. PROBABILITY, STATISTICS, CURVE FITTING

DECUS NO.	TITLE
FOCAL8-308	Fisher's F, Student's t and Chi Squared Distribution
FOCAL8-314	Y-Value Calculations
FOCAL8-315	YORK2 - Two Error Linear Regression with Correlated Errors
FOCAL8-330	SIMPLE

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

FOCAL8-315	YORK2 - Two Error Linear Regression with Correlated Errors
FOCAL8-318	ACTIV1 - Irradiation Time Calculation for a Desired Radioisotope Activity
FOCAL8-319	FOCLAB - A Language for Computer Controlled Psychology Research
FOCAL8-321	Probit Analysis
FOCAL8-322	VDW - Van Der Waal's Equation of State
FOCAL8-323	TDES - Transformer Design
FOCAL8-324	PCOL - Pipe Column Selection
FOCAL8-326	LCRU - LC Resonance with Units
FOCAL8-327	DEWP - Pressure Dewpoints
FOCAL8-328	CONVM

XII. HARDWARE CONTROL

FOCAL8-312	CVFCPTG (Centronics Vertical Format Control Paper Tape Generator)

XIII. GAME, DEMONSTRATION

FOCAL8-300	Computer Bowl
FOCAL8-302	XSTOCK - Stockmarket Simulation Game
FOCAL8-303	STKMKT - Stock Market Game
FOCAL8-304	Tic-Tac-Toe
FOCAL8-305	RUBEN
FOCAL8-306	FOCAL Baseball
FOCAL8-307	Casino, Demos, Bombing Mission, Double Hangman
FOCAL8-316	BANCPO - Bank Portfolio Simulation
FOCAL8-317	UFO-24 - A Dynamics Simulation Game

XIV PLOTTING

DECUS NO.	TITLE
FOCAL8-4	Prime Plots
FOCAL8-12	QUIP1: Quick Plot in Quadrant 1
FOCAL8-13	3-D Plotter
FOCAL8-84	2D Plotter Patch for FOCAL 69
FOCAL8-97	Multiple Equation Graphing on a Teletype
FOCAL8-126	PLOTTER
FOCAL8-195	All Purpose Graphing Program

XV. DESK CALCULATOR, BUSINESS APPLICATION

FOCAL8-316	BANCPO - Bank Portfolio Simulation

XVI. MAINTENANCE

XVII. MISCELLANEOUS

FOCAL8-85	Program Replication
FOCAL8-87	Keyboard Readable Punch
FOCAL8-155	FACTORS
FOCAL8-161	Wilmot Grading Program
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL, 1969
FOCAL8-258	Hearing Loss Simulator

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No.	TITLE	MEDIA/PRICE CODES
FOCAL8-300	Computer Bowl	D01, G02
FOCAL8-301	U/W FOCAL	A01, B13, F10, G16, H12, J11
FOCAL8-302	XSTOCK - Stockmarket Simulation	D01, F02, G02
FOCAL8-303	STKMKT - Stock Market Game	D01, G02
FOCAL8-304	TIC-TAC-TOE	D01, G02
FOCAL8-305	RUBEN	D01, G02
FOCAL8-306	FOCAL Baseball	D01, G02
FOCAL8-307	Casino, Demos, Bombing Mission, Double Hangman	A01, G06, W00
FOCAL8-308	Fisher's F, Student's t and Chi Squared Distributions	D01, G02
FOCAL8-309	DBCONV - Decimal-Binary Converter	D01
FOCAL8-310	Overlay for KV8I - OMSI FOCAL 1971	D01, G06
FOCAL8-311	SIXPAC	D01, F02, G02
FOCAL8-312	CVFCPTG (Centronics Vertical Format Controlled Paper Tape Generator)	D01, G02
FOCAL8-313	EAE Patches to FOCAL	D01, F02, G06
FOCAL8-314	Y-Value Calculations	D01, G02
FOCAL8-315	YORK2-Two Error Linear Regression with Correlated Errors	D01, G02
FOCAL8-316	BANCPO - Bank Portfolio Simulation	D01, G02
FOCAL8-317	UFO-24 - A Dynamics Simulation Game	D01, G02
FOCAL8-318	ACTIV1 - Irradiation Time Calculation for a Desired Radioisotope Activity	A01, G02, W00
FOCAL8-319	FOCLAB - A Language for Computer Controlled Psychology Research	A02, F02, H12, X00
FOCAL8-320	WALLIS and INTCAL	D01
FOCAL8-321	Probit Analysis	D01, G02
FOCAL8-322	VDW - Van Der Waal's Equation of State	D01, G02
FOCAL8-323	TDES - Transformer Design	D01, G02
FOCAL8-324	PCOL - Pipe Column Selection	D01, G02
FOCAL8-325	FWNO - FOCAL WRITE NULLS OVERLAY	D01
FOCAL8-326	LCRU - LC Resonance with Units	D01, G02
FOCAL8-327	DEWP - Pressure Dewpoints	D01, G02

FOCAL8-328	CONVM: Interconversion of Mass and Volume Units	D01, G02
FOCAL8-329	FOCAL Generates Binary Patches and Disassembles Binary Tapes	D01, G02
FOCAL8-330	SIMPLE: The Simple Method to Fit Equations to Data	D01, G02

DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
FOCAL8-300	$ 1.	$	$2.	$ Inc.	$	$	$	$	$	$	
FOCAL8-301	1.	16.	40.	25.	8.	20.	8.	18.			1 DTA, 1 LTA
FOCAL8-302	1.	2.	2.	Inc.							Both tapes needed to run program
FOCAL8-303	1.		2.	Inc.							
FOCAL8-304	1.		2.	Inc.							
FOCAL8-305	1.		2.	Inc.							
FOCAL8-306	1.		2.	Inc.							
FOCAL8-307	1.		8.								
FOCAL8-308	1.		2.	Inc.							
FOCAL8-309	1.			Inc.							
FOCAL8-310	1.		8.	Inc.							
FOCAL8-311	1.	2.	2.	Inc.							
FOCAL8-312	1.		2.	Inc.							
FOCAL8-313	1.	2.	8.	Inc.							
FOCAL8-314	1.		2.	Inc.							
FOCAL8-315	1.		2.	Inc.							
FOCAL8-316	1.		2.	Inc.							
FOCAL8-317	1.		2.	Inc.							
FOCAL8-318	1.		2.								
FOCAL8-319	2.	2.		On tape	8.	20.					1 DTA (obj, src); 1 Floppy Disk $8/20
FOCAL8-320	1.			Inc.							
FOCAL8-321	1.		2.	Inc.							
FOCAL8-322	1.		2.	Inc.							
FOCAL8-323	1.		2.	Inc.							
FOCAL8-324	1.		2.	Inc.							
FOCAL8-325	1.			Inc.							
FOCAL8-326	1.		2.	Inc.							
FOCAL8-327	1.		2.	Inc.							
FOCAL8-328	1.		2.	Inc.							
FOCAL8-329	1.		2.	Inc.							
FOCAL8-330	1.		2.	Inc.							

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO. FOCAL8-300

Computer Bowl

Dolores Sochacki, A. B. Dick, Chicago, Illinois

The program is one in which the user participates by rating himself as to his bowling skill. The number of pins knocked down in each frame is a function of the DEC random number generator (FRAN ( )) and the users' bowling rating of his skill.

The number of pins per ball, strike or spare and the calculated score are all displayed on whatever terminal is available.

Storage Requirement:	4K (without extended functions)
Source Language:	FOCAL '69

DECUS NO. FOCAL8-301

U/W FOCAL

Jim Van Zee, University of Washington, Seattle, Washington

U/W FOCAL is an expanded version of PS/8 FOCAL (FOCAL8-177) which offers 13 new commands (including 2 unused ones), 15 more function entries (30 altogether), and many other improvements, all in the same amount of core space! Among the new features are FOCAL Statement Functions, double subscripting, variable file names, decrementing loops, the constant PI, new EAE routines for the 8/E (and older machines too), several improved functions, a command for printing the date and a way to use the teletype as a giant switch register. This version of FOCAL offers exceptional flexibility for laboratory applications as well as greatly enhanced performance for purely numerical problems. 10-digit precision (a unique feature of FOCAL) is standard.

Minimum Hardware:	OS/8, PS/8 or OS/12 Configuration
Other Programs Needed:	Operating systems to support configuration
Storage Requirement:	8K
Restrictions:	1-page I/O Handlers
Miscellaneous:	Individual files are available on paper tape. Contact DECUS for charges
Source Language:	PAL-8

DECUS NO. FOCAL8-302

XSTOCK - Stockmarket Simulation Game

Alvin Yellon and Mike Benveniste, Computonostra Programming Club, Highland Park, Illinois

The program simulates the actual stock market as closely as possible. The user has a choice of seven stocks in which to buy or sell shares. The price of a share rises or falls randomly, using a FNEW random number function, within a range of ± 5 dollars. The brokerage fee and stock index are calculated by following the actual exchange procedure as closely as possible. The program is also set up so that at any given time, any stock can undergo a 2 for 1 split. The output includes price, holdings, change, percent change, and any dividend paid.

Minimum Hardware:	4K PDP-8, ASR-33
Restrictions:	Runs only under FOCAL-69 without extended functions. Square root function cannot be called when overlay is in use.
Source Language:	FOCAL 1969

DECUS NO. FOCAL8-303

STKMKT - Stock Market Game

Philip J. Hunt, Middletown Township High School, Middletown, New Jersey

This game makes you the buyer in an imaginary stock market. You may buy or sell in a field of 10 stocks on this market. The computer keeps track of your purchases, your money on hand, and the changing stock prices.

A feature of this game is that you type in the names of your 10 stocks, 9 letters (or characters) per name.

Minimum Hardware:	8K PDP-8
Other Programs Needed:	DECUS FOCAL8-52a and FOCAL8-189
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-304

TIC-TAC-TOE

William R. Murray, Arlington, Texas
Submitted by: Diane Drum, Digital Equipment Corporation, Maynard, Massachusetts

A short tic-tac-toe program for FOCAL 5/69 (DECUS FOCAL8-52a). Program always plays center square when given several options, otherwise picks squares at random. However, it does not play blindly and will either play to win or to block a win.

Minimum Hardware:	4K PDP-8 without extended functions
Source Language:	FOCAL 5/69

DECUS NO. FOCAL8-305

RUBEN

James R. B. Howard II and Jimmie B. Fletcher, AIL Information Systems, APO New York

A modification of the "King of Sumeria" game. Problems with the random number generator have been corrected and some additional features have been added.

Minimum Hardware: 8K PDP-8/I, ASR33
Other Programs Needed: FOCAL 1969 with 8K overlay
Source Language: FOCAL

DECUS NO. FOCAL8-306

FOCAL BASEBALL

Philip Hunt, Middletown TWP High School, Middletown, New Jersey

This program lets you play a game of baseball against the computer. It has all the rules normally seen in a game of baseball, and many of the plays seen in the game including: walk, ball, strike, strike-out, foul balls, 9 types of hits, catches, 9 types of pitches, wild pitches, runners stealing, pick-off tries at any base, batter hit by patch, caught foul balls and others.

Minimum Hardware: 8K PDP-8/S, TTY, High speed reader recommended
Other Programs Needed: DECUS FOCAL8-52a and 8K overlay patch (DECUS FOCAL8-189)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-307

Casino, Demos, Bombing Mission, Dougle Hangman

Philip Hunt, Middletown Township High School, Middletown, New Jersey

A group of games and demonstration programs which utilize FOCAL 5/69 (FOCAL8-52a) and its 8K overlay (FOCAL8-189).

Source Language: FOCAL 5/69

DECUS NO. FOCAL8-308

Fisher's F, Student's t and Chi Squared Distributions

Thomas V. McCaffrey, Stritch School of Medicine, Loyola University, Maywood, Illinois

Two FOCAL coded programs written to calculate the probability distributions of three statistical functions: Fisher's F, Student's t and Chi squared. The first program calculates both the F and t distributions. The second program calculates the Chi squared distribution.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL '69

DECUS NO. FOCAL8-309

DBCONV, Decimal-Binary Converter

Bob Kelley, 5 Atlantic Avenue, North Providence, Rhode Island

DBCONV is a simple program written in the FOCAL 5/69 language which will convert decimal numbers of up to 6 decimal digits to binary integers of up to 24 bits precision and up to 72 bits in length. Leading zeroes are suppressed in the output. Negative numbers are taken as their 12-bit 2's complement.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL 5/69 (DECUS FOCAL8-52a)
Source Language: FOCAL 5/69

DECUS NO. FOCAL8-310

Overlay for KV8I - OMSI FOCAL 1971

Michael B. Erickson, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

This overlay provides OMSI FOCAL 1971 with graphics display capabilities, through the functions FDIS and FJOY as described in the PS/8 FOCAL, 1971 user guide. Also character display, using the variable stroke character generator, of text is also provided. This patch requires at least 12K of memory, since it takes advantage of the fact that OMSI FOCAL only resides in 8K memory.

Minimum Hardware: OS/8 configuration with KV8I/VT01 Storage Scope
Other Programs Needed: OMSI FOCAL '71 (FOCAL8-177)
Storage Requirement: 12K
Source Language: PAL-8

DECUS NO. FOCAL8-311

SIXPAC

Richard Small, Federal Products Corporation, Inc., Providence, Rhode Island

SIXPAC reads, echoes, and packs characters into variable storage with a density of six (6) characters per variable, types them in the form entered, and does not require pre-assignment of core for character storage. Entering, editing and typing the six character blocks is done during execution of a FOCAL program.

Minimum Hardware: PDP-8/E
Other Programs Needed: FOCAL/F, paper tape version (FOCAL8-227a)
Storage Requirement: 172 octal words (on one page)
Source Language: PAL III

DECUS NO. FOCAL8-312

CVFCPTG (Centronics Vertical Format Control Paper Tape Generator)

W. E. Hamilton, 212F Red Oak Drive East, Sunnyvale, California

This is a FOCAL coded utility program which will produce vertical format control (carriage control) tapes for a Centronics printer.

Minimum Hardware:	4K PDP-8/I, ASR33
Restrictions:	Cannot be run with extended functions
Source Language:	FOCAL '69

DECUS NO. FOCAL8-313

EAE Patches to FOCAL

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

These are Mode "B" Extended Arithmetic Element patches to two versions of the FOCAL language, namely to DEC's FOCAL-8, the revision of FOCAL, 1969, and to DECUS' FOCAL 5/69 ("Taft" FOCAL).

Mode "B" of the EAE is available only on PDP-8/E and later models. The PDP-12 and the PDP-8/I EAE run in mode "A" only. It is likely that some parts of the patches might be recodable into mode "A".

The patch to DEC's FOCAL-8 does things to the addition routines as well as to the floating multiply and divide routines. The other patch restricts itself to floating multiply and divide only. On a sample program calculating a lot of arc sines, the FOCAL-8 patch caused the program to run in about 40% less time than was required with unpatched FOCAL-8; the TAFT patch saved about 30% as compared with unpatched FOCAL 5/69.

It should be remembered that both languages are interpretive and use interpretive calls to their floating point packages. A substantial fraction of the run time of a program is determined simply by the language structure.

Source Language: PAL-8

DECUS NO. FOCAL8-314

Y-Value Calculations

G. Brent Dalrymple, U. S. Geological Survey, Menlo Park, California

This program calculates values of Y using any of eight different equations given the coefficients of the equation selected and values of X. A ninth option allows the user to enter any equation of his or her choice. The equations available are: (1) $y = a + bx$, (2) $y = a + b/x$, (3) $\ln y = a + bx$, (4) $\ln y = a + b \ln x$, (5) $y = ab^x$, (6) $y = ax^b$, (7) $y = a + be^x$, and (8) $y = a + bx + ce^{dx}$.

Minimum Hardware:	8K PDP-8, keyboard terminal
Other Programs Needed:	FOCAL-8
Source Language:	FOCAL-8

DECUS NO. FOCAL8-315

YORK2 - Two Error Linear Regression with Correlated Errors

G. Brent Dalrymple, U. S. Geological Survey, Menlo Park, California

YORK2 is a linear regression program that allows for errors in both X and Y and also for positive and negative correlation of the X and Y errors. The program accepts errors for each value of X and Y. If the errors are uncorrelated, the correlation coefficient ($-1 \leq R \leq 1$) may be set to zero. Output consists of the slope, the intercept, the coordinates of the centroid and six statistical parameters. The program uses the "least squares cubic" method of D. York, University of Toronto (York, 1969). It requires 8K of core.

Minimum Hardware:	8K PDP-8, keyboard terminal
Other Programs Needed:	8K FOCAL-8
Source Language:	FOCAL-8

DECUS NO. FOCAL8-316

BANCPO - Bank Portfolio Simulation

Dr. John A. Tribble, Newberry College, Newberry, South Carolina

This routine simulates the decision making process of the commercial banker, a risk-filled and uncertain world where there is interdependency of bankers' decisions. General data is entered describing a banking market with five competitors. Each of the five competing banks enters a level of government securities, an initial net worth, and interest rates paid on savings accounts, paid on certificates of deposits, and charged on loans. The program calculates assets and liabilities for each bank adjusting assets to meet required reserves. The output consists of a balance sheet for the last day of the decision period and an income statement for the period.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FOCAL, 1969 & INIT
Restrictions:	Extended functions removed from FOCAL
Source Language:	FOCAL

DECUS NO. FOCAL8-323

TDES - Transformer Design

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program calculates the turns and wire size required for an audio transformer. The method is based on the article by Ed Francis in Popular Electronics, September 1970, page 78. Wire sizes are calculated on the basis of 800 c.m./A.

Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-324

PCOL - Pipe Column Selection

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program selected the lightest standard pipe which will carry a given eccentric load for a given height. Schedule 40 and Schedule 80 pipes from 1 to 12 inches are included in the data table. The program returns the size and schedule of the pipe having the least area (or weight) which will give a maximum stress less than 20,000 psi.

The usual engineering judgments must be made in selecting the input data. For example, the column length must be the Euler length, which depends on the mode of support for the particular column. Care must also be taken in the selection of eccentricity values, as values near zero are unrealistic. The secant formula is used for computing the maximum stress; limitations to the use of this formula must be observed.

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-325

FWNO - FOCAL WRITE NULLS OVERLAY

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc.
Amarillo, Texas

This short overlay (13 words) to FOCAL-69 modifies the WRITE command to output three nulls after every line. This produces a program tape with three frames of blank tape between program lines. As blank tape is ignored by the input routine, program tapes produced using this overlay do not require periodic stopping of the low-speed reader on input.

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Source Language: FOCAL
Restrictions, Deficiencies, Problems: Will not work with 8K overlay, only with 4K overlay

DECUS NO. FOCAL8-326

LCRU - LC Resonance with Units

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc., Amarillo, Texas

This program calculates F, L, or C from the other two known values, with units specified. Result will be converted to consistent units for output. Acceptable units are as follows:

Value	Units
F	HZ, KHZ, MHZ, GHZ
L	H, MH, UH, NH
C	F, UF, PF

Monitor/Operating System: FOCAL-69
Core Storage Required: 4K
Hardware Required: Console TTY
Source Language: FOCAL

DECUS NO. FOCAL8-327

DEWP - Pressure Dewpoints

Philip M. Spray, Mason and Hanger-Silas Mason Co., Inc.
Amarillo, Texas

This program calculates the new dewpoint of air of a specified dewpoint when compressed from local atmospheric pressure to a higher pressure. The output of this program is a table of dewpoints.

Monitor/Operating System: FOCAL '69
Core Storage Required: 4K
Hardware Required: Console TTY
Other Software Required: FOCAL '69
Source Language: FOCAL '69

DECUS NO. FOCAL8-328

CONVM: Interconversion of Mass and Volume Units

Barry L. Johnson, Ph.D.
National Institute for Occupational Safety and Health, Cincinnati, Ohio

Program CONVM is a program written in U/W FOCAL (DECUS-301) for the purpose of providing quick interconversions between mass and volumetric units for gases. As an example, convert 100 parts per million of carbon monoxide to its equivalent in units of milligrams per cubic meter. CONVUM contains a library of the more common elements and permits the user to enter the chemical structure of the compound if the molecular weight is not known. By using the ideal gas law , the program computes the interconversion of units from mass to volumetric, or vice versa, over a range of values and prints the results on the teletypewriter.

Monitor/Operating System: OS/8
Core Storage Storage Required: 8K

June 1976

DECUS NO. FOCAL8-328 (CONTINUED)

Hardware Required:	Teletype or DECwriter
Other Software Required:	U/W FOCAL (DECUS FOCAL8-301)
Source Language:	U/W FOCAL

DECUS NO. FOCAL8-329

FOCAL Generates Binary Patches and Disassembles Binary Tapes

Aldo F. Roman
Don Bosco Technical High School, Paterson, New Jersey

The first part of the program is similar to DECUS NO. FOCAL8-206, with these added advantages:
a- no need of carriage return or space.
b- possibility of entering field settings
c-application of standard symbols, as * and $ used in machine language
d- avoid overflow in checksum caused by long patches
e- increased speed
In its second part it disassembles, in octal format, a binary tape, for checking purposes.

Core Storage Required:	4K
Hardware Required:	PDP-8, ASR33
Other Software Required:	FOCAL 5/69, (DECUS FOCAL8-52a)
Source Language	FOCAL 5/69

DECUS NO. FOCAL8-330

SIMPLE: The Simplex Method to Fit Equations to Data

G. H. Lameris - Author
J. Schram - Submitter
University of Technology Delft, Delft, The Netherlands

This program fits any equation to any set of data. Its only restriction is the amount of core required. If the extended functions are retained in 4K, there is only room for 50 variables, after the program has been loaded. The user's equation and the variables the program needs will soon exceed this amount of core. Without the extended functions the program can handle 20 pairs of data or a complicated equation.
The user has to write his equation and to load his data into core himself.

Core Storage Required:	4K
Other Software Required:	FOCAL 5/69, PS/8 FOCAL'71 (8K machines only)
Restrictions, Deficiencies, Problems:	Not very useful when extended functions are retained (with 4K machines only.)

C-1 CLASSIC APPLICATION PACKAGE

No.	MEDIA/PRICE CODES
C-1	D01, K14
C-1A	D01, K09
C-1B	D01, K09

The programs in this Applications Package are taken from three major areas of study: Statistics, Mathematics and Chemistry. It includes such programs as LESQ (DECUS No. 8-661, written in FORTRAN), which will perform a GAUS-Newton method of least squares analysis; PERIOD (DECUS No. BASIC8-40, written in BASIC), which is an interactive quiz on the periodic table of the elements; and MATMUL (DECUS No. 8-75, written in FORTRAN), which will multiply any two matrices. The package also includes some function subprograms and subroutine subprograms, written in FORTRAN, which will be of use to the user.

This package is offered on two diskettes (floppy disks).

C-1A contains 40 FORTRAN routines and is accompanied by pertinent documentation.

C-1B contains 38 BASIC routines and is accompanied by pertinent documentation.

ENG-1 CMS/1 APPLICATIONS PACKAGE

This is a compilation of statistical and mathematical programs originally submitted to DECUS by individual members. They are combined here on a floppy diskette for convenient use on the CMS/1.

The programs in the package are written in FORTRAN compatible with OS/8 and FORTRAN IV, and include the following functions: Fourier Transform, correlation, standard deviation, cluster analysis, analysis of variance, general non-linear least squares, curvilinear regression, orthogonal regression, cumulative Gaussian distribution curve fitting, J. Bessel function matrix, Eigenvalues and Eigenvectors.

MEDIA/PRICE CODES

A02, K09, W00

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
12-10	FOCAL Library (LINCtape FOCAL for the PDP-12
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-45	FOCALP-FOCALPE
12-48	PS/8 FORTRAN Library Routines
12-54	QUIP - Quick Assembler for the PDP-12
12-61	Generating Random Numbers with FOCAL
12-67	PPG FOCAL
12-77	PAL12A Assembler
12-80	FOCAL - RT
12-101	OS/8 SKED
12-108	FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-110	DIAL-MS for 1600 Blocks
12-120a	DUAL
12-124	FR, FDIS and FADC for PDP-12 Input/Output
12-129	OS/12X Scope Monitor Operating System
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8, OS/12
12-134	RWDF32
12-135	MAC8, 8K MACRO ASSEMBLER
12-137	PAL12D
12-138	ISEL
12-153a	DUAL32, DUAL-28K Assembler
12-154a	CREF32
12-164	DIAL.EXT
12-167	FOCAL Patches
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-178	NUFOCAL, Modified FOCAL-12
12-180	CARDDIAL - Input to the DIAL Editor Via Cards
12-186	COBRA Assembler for the PDP-12
12-188	4K DISK/LINCTAPE MONITOR
12-189	DECtape Reader Handler for PDP-12
12-191	MTXIO - Multitasking Executive

II. TEXT EDITING, TEXT MANIPULATION

DECUS NO.	TITLE
12-6	ANDIP - Analog Digital Interchange Program
12-39	QUANAT 1
12-50	EDIT-12
12-66	ADDINDX (LAP6-DIAL-MS Index
12-82	LAP6-DIAL to PS/8 Source File Converter
12-96A&B	SCOPE and CNGMWA
12-163	AD74 - High Speed Analog to Digital Conversion Program

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

12-11	ODTAPE (Octal Debugger for PDP-12 LINCtape)
12-21	Modified MAGSPY
12-30	TDUMP
12-76	TAPELOOK; CORELOOK; SEARCH
12-91	OCTPUNCH
12-124	FR, FDIS and FADC for PDP-12 Input/Output
12-142	FOCALSD
12-154a	CREF32
12-162	COREDIT

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
12-17a	DIALRFØ8
12-20	FORMATXT
12-152	LOAD31K, A Loader for DIAL-MS and 32K of Core

V. DUPLICATION, VERIFICATION

12-18	"FAILSAFE"
12-32	COMPAR12
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

DECUS NO.	TITLE
12-7	DBLFLT - Double Float Mathematical Routines
12-14	MUL-2REG
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C
12-34	STAP-12
12-41	BLOOPD - Blood Pressure Display Program
12-64	Walsh Transform Subroutines, PWALSH and LWALSH
12-67	PPG FOCAL
12-68	A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor
12-88	OCTALFPP
12-89	BUTFLTR
12-90	REPRSNT
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine
12-183	DECIO - FOCAL-12 Whole Word Digital I/O Overlay
12-201	DPSPV3: Double Precision to Single Precision Integer Conversion

VII. UTILITY

DECUS NO.	TITLE
12-2	PDP-12 Utility and Data Reduction Programs
12-8	Teletype Conversion Routines
12-9	SLOWCREF
12-13	RDPEC: PEC Synchronous Tape Read Program
12-21	Modified MAGSPY
12-24	Overlays to FOCAL-12
12-31	DCON-10
12-56	QANDA+ - Modified QANDA Subroutine
12-57	SPY+ - Modified MAGSPY
12-58	FIFOCON
12-66	ADDINDX (LAP6-DIAL-MS Index Manipulator)
12-79	Modified ADTAPE
12-81	VR12 SCOPE HANDLER FOR OS/8
12-87	ONDISK-OFFDISK
12-89	BUTFLTR
12-92	PDP8TO12
12-93	TRANS
12-95	PDP-12 PS/8 Utility Programs
12-107	AVUPTO8, AVUPTO8S
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-117	TAPEDIT, A PDP-12 LINCTAPE EDITOR
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-122	PDP-12 User's Monitor Command
12-123a	OS/8 VR12 Handler
12-130	COMPARE - Fast LINCtape Compare
12-131	OS/8 DIBILD - Revised
12-136	MOVE
12-142	FOCALSD
12-143	DSLIS - Dead Start Loader and Index Statistics
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-145a	CREFNMAP
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape
12-154a	CREF32
12-155	MARK12XØ
12-158	FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's
12-160	CCTGEN - Carriage Control Tape Generator
12-172	WVU Utility Package
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-189	DECtape Reader Handler for PDP-12
12-190	PDP-12 Functions for OS/8 BASIC
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12
12-196	TRALIB - Point Process Data Library and Editor
12-197	SUPRQA - Super QANDA
12-199	CPRINT: Utility Subroutine
12-200	MUHT-PS2

VIII. DISPLAY

DECUS NO.	TITLE
12-6	ANDIP - Analog Digital Interchange Program
12-21	Modified MAGSPY
12-33	KWANDA
12-37	ODCAD (Octal to Decimal Conversion and Display)
12-39	QUANAT 1
12-41	BLOOPD - Blood Pressure Display Program
12-51	MAGSPYD
12-57	SPY+ - Modified MAGSPY
12-71	Snoopy Display Program
12-76	TAPELOOK; CORELOOK; SEARCH
12-103	$HAPPY
12-109A,B,C	QNANSWER, QANDTTY, SUPRSHUF
12-115	PLOT3D, Pseudo 3-Dimensional Perspective Display for the PDP-12
12-123a	OS/8 VR12 Handler
12-125	Waveform Analysis
12-126	WAVEFORM: Evoked Potential Analysis
12-157	PLOTVS, Device Independent Graphics
12-161	BIGCHARS
12-162	COREDIT
12-166	OS/8-VC12 Display Device Handler for the PDP-12
12-167	FOCAL Patches
12-173	SCOPEFOCAL
12-181	ATSXL - Text Display and Timing Routine for FOCAL-RT

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

DECUS NO.	TITLE
12-12	8TO12 File Converter
12-34	STAP-12
12-46	STRINGS
12-47	PIP16ØØ
12-80	FOCAL - RT
12-105	DATAFILE and DFUPDATE
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12
12-139	BURST - WITHDRAWN - See 12-198
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-192	ASFLO - Packed ASCII to Floating Point Format Conversion
12-195	TRIGSYS - A Multichannel Fast Point Process Data Acquisition
12-198	BURST, V2 - A Point Process High-Pass Filter

X. PROBABILITY, STATISTICS, CURVE FITTING

12-34	STAP-12
12-38A	Histogram and One-Factor Analysis of Variance
12-38B	Histogram and Two-Factor Analysis of Variance
12-74	*REGRES - Multiple Linear Regression
12-83	$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN
12-99	A Set of Spectral Programs
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-141	$CORREL - Intercorrelation Program for 50 Variables
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-146	$CORR. (FOCAL Version)
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples
12-148	STATIS12, A Statistical Package for the PDP-12
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12
12-179	The Mann-Whitney U Test
12-194	Split Plot Factorial Analysis of Variance

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

12-1	EEG Data Collection (BNI Series)
12-4	IRDA
12-15	HISTO12
12-22	PLOTFFT
12-23	CFFT
12-34	STAP-12
12-35	Bioelectric Signal Sorter (JULIA)
12-41	BLOOPD - Blood Pressure Display Program
12-43	PLOT3D
12-44	AVERDT
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments
12-55	FFAESIM
12-62	RUFUS
12-63	OLFFT1 and FETCHFFT
12-65	PISH - Poststimulus Time and Interspike-Interval Histogram
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers
12-72	Four-Point Smoothing with FPP-12
12-73	8-Point Quadratic Smooth with FPP-12
12-80	FOCAL - RT
12-89	BUTFLTR
12-94	DATAN
12-97	An Off-Line FOCAL-12 Program for Auto Analyzers by TWX
12-98	HERALD - Analog-Digital Average and Standard Error Program
12-101	OS/8 SKED
12-104	CORDATFP
12-107	AVUPTO8
12-109A,B,C	QNANSWER, QANDATTY, SUPRSHUF
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-121	Arrhythmia Detection and Categorization
12-125	Waveford Analysis
12-126	WAVEFORM: Evoked Potential Analysis
12-128	GEP: A Generalized Experimental Package
12-139	BURST - WITHDRAWN - See 12-198
12-140	NAEP - Nerve Action and Evoked Potentials
12-144	ANECDOTE - Advanced NauroElectric Computer Data Operational Tape (Export)
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples
12-151	"PSYCHO," A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics
12-163	AD74 - High Speed Analog to Digital Conversion Program
12-165	NAP SYS: Program to Analyze Neuronal Spike Data
12-168	Spectral Analysis System
12-182	KLK - A Simple Clock Overlay for PDP-12 FOCAL
12-184	PPSH - Neuronal Autocorrelation and Crosscorrelation Analysis Programs
12-185	Horoscope Casting Routines - Astrodynami cal Subroutines
12-198	BURST, V2 - A Point Process High-Pass Filter
12-202	PLOT8CH: 3 Dimensional Plotting of EEG DATA

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XII. HARDWARE CONTROL

DECUS NO.	TITLE
12-29	LINC-10
12-75	FORTRAN Subroutines for the PDP-12
12-114	FOCAL-PL
12-166	OS/8-VC12 Display Device Handler for the PDP-12
12-176	FOCAL-12 Overlay to Access the DF32 Disk
12-187	OS/8 Device Handlers for PDP-12 Core

XIII. GAME, DEMONSTRATION

12-21	Modified MAGSPY
12-36	Hangman for PDP-12
12-60	SUMER (French)
12-71	Snoopy Display Program
12-85	APOLLO 12
12-86	ORGAN-AA and ORGAN+B
12-103	$HAPPY
12-156	MUSIC12
12-159	PLAYBOY
12-161	BIGCHARS
12-177	Tennis
12-185	Horoscope Casting Routines - Astrodynamical Subroutines

XIV. PLOTTING

12-42	CALCO12
12-59	FOCPLOT
12-70	COMPLT
12-78	PUBPLOT
12-84	AVERAGER
12-106	$PLOT
12-107	AVUPTO8, AVUPTO8S
12-114	FOCAL-PL
12-157	PLOTVS, Device Independent Graphics
12-175	PLOTZER
12-202	PLOT8CH: 3 Dimensional Plotting of EEG Data

XV. DESK CALCULATOR, BUSINESS APPLICATION

DECUS NO.	TITLE

XVI MAINTENANCE

12-16	MODCLK

XVII. MISCELLANEOUS

12-5	SERCHPRO
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-49	Cold Start DR32 Disk Formatter for PS/8 on a PDP-12
12-52	Student Test Analysis
12-102	A Manual for the PDP-12 Operator
12-171	Three Patches to the Clinical LAB-12 System
12-174	CLOCK: Digital Clock with Westminster Chimes
12-185	Horoscope Casting Routines - Astrodynamical Subroutines

DECUS NO.	TITLE
12-48	PS/8 FORTRAN Library Routines
12-49	Cold Start DF32 Disk Formatter for PS/8 on a PDP-12
12-50	EDIT-12
12-70	COMPLT
12-95	PDP-12 PS/8 Utility Programs
12-96A&B	SCOPE and CNGMWA
12-101	OS/8 SKED
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-123a	OS/8 VR12 Handler
12-124	FR, FDIS and FADC for PDP-12 Input/ Output
12-129	OS/12S Scope Monitor Operating System
12-131	OS/8 DIBILD - Revised
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine
12-134	RWDF32
12-135	MAC8, 8K MACRO ASSEMBLER
12-136	MOVE
12-137	PAL12D
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter
12-157	PLOTVS, Device Independent Graphics
12-166	OS/8-VC12 Display Device Handler for the PDP-12
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12
12-172	WVU Utility Package
12-187	OS/8 Device Handlers for PDP-12 Core
12-189	DECtape Reader Handler for PDP-12
12-190	PDP-12 Functions for OS/8 BASIC
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12
12-196	TRALIB - Point Process Data Library and Editor
12-198	BURST, V2 - A Point Process High-Pass Filter
12-199	CPRINT. SB: Utility Subroutines for a Centronics 101A Printer
12-201	DPSPV3: Double Precision to Single Precision Integer Converter

DECUS PROGRAM LIBRARY

PDP-12 NUMERICAL INDEX

No.	TITLE	MEDIA/PRICE CODES
12-1	EEG Data Collection (BNI Series)	A01, J11, W00
12-2	PDP-12 Utility and Data Reduction Programs	A01, J11, W00
12-4	IRDA	A01, J11, W00
12-5	SERCHPRO	D01, J11
12-6	ANDIP - Analog Digital Interchange Program	A01, B07, J11
12-7	DBLFLT - Double Float Mathematical Routines	A01, J11, W00 } same LINCtap
12-8	Teletype Conversion Routines	A01, J11, W00 }
12-9	SLOWCREF	A01, B07, J11
12-10	FOCAL Library (LINCtape FOCAL for the PDP-12)	D01, J11
12-11	ODTAPE (Octal Debugging for PDP-12 LINCtapes)	D01, J11 *
12-12	8TO12 File Converter	A01, J11, W00
12-13	RDPEC: PEC Synchronous Tape Read Program	D01, J11
12-14	MUL-2REG	D01, J11
12-15	HISTO12	D01, J11 *
12-16	MODCLK	D01, F02, G02
12-17a	DIALRF08	D01, J11
12-18	"FAILSAFE"	D01, F02, G02
12-20	FORMATXT	A01, F02, G02, W00
12-21	Modified MAGSPY	A01, F02, W00
12-22	PLOTFFT	A01, B07, J11 } same LINCtape
12-23	CFFT	A01, B07, J11 }
12-24	Overlays to FOCAL-12	D01, J11
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C	A01, J11, W00
12-29	LINC-10	G06, W00, Y00
12-30	TDUMP	A01, B07, J11
12-31	DCON-10	A01, B12, J11
12-32	COMPAR12	A01, B07, J11
12-33	KWANDA	A01, B05, J11
12-34	STAP-12	A01, J22, W00
12-35	Bioelectric Signal Sorter (JULIA)	A01, J11, W00
12-36	Hangman for PDP-12	A01, J11, W00 } same LINCtape
12-37	ODCAD (Octal to Decimal Conversion and Display)	A01, J11, W00 }

* same LINCtape; contains 12-11 & 12-15

No.	TITLE	MEDIA/PRICE CODES	
12-38A	Histogram and One-Factor Analysis of Variance	D01, J11	same LINCtape
12-38B	Histogram and Two-Factor Analysis of Variance	D01, J11	
12-39	QUANAT 1	A01, J11, W00	
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface	A01, J11, W00	
12-41	BLOOPD - Blood Pressure Display Program	A01, F02, G06, W00	
12-42	CALCO 12	A01, B05, J11	
12-43	PLOT3D	A01, J11, W00	same LINCtape
12-44	AVERDT	A01, J11, W00	
12-45	FOCALP-FOCALPE	A01, J11, W00	
12-46	STRINGS	A01, J11, W00	* same LINCtape
12-47	PIP-1600	A01, J11, W00	
12-48	PS/8 FORTRAN Library Routines	A01, B07, J11	
12-49	Cold Start DF32 Disk Formatter for PS/8 on a PDP-12	D01, J11	
12-50	EDIT-12	J11, W00, Y00	
12-51	MAGSPYD	A01, B07, J11	
12-52	Student Test Analysis	A01, G02, W00	
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments	A01, G02, W00	
12-54	QUIP - Quick Assembler for the PDP-12	A01, B07, J11	
12-55	FFAESIM	D01, F02, G02	
12-56	QANDA+ - Modified QANDA Subroutine	A01, B05, J11	same LINCtape
12-57	SPY+ - Modified MAGSPY	A01, B05, J11	
12-58	FIFOCON	D01	
12-59	FOCPLOT	D01, J11	
12-60	SUMER (French)	D01, J11	
12-61	Generating Random Numbers with FOCAL	D01	
12-62	RUFUS	A01, J11, W00	
12-63	OLFFT1 and FETCHFFT	A01, J11, W00	
12-64	Walsh Transform Subroutines, PWALSH and LWALSH	D01, G02	
12-65	PISH - Poststimulus Time and Interspike - Interval Histogram	A01, J11, W00	
12-66	ADDINDX (LAP6-DIAL-MS Index Manipulator)	A01, J11, W00	
12-67	PPG FOCAL	D01, J11	
12-68	A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor	A01, B07, J11	

* same LINCtape; contains 12-110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES	
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers	D01, J11	
12-70	COMPLT	A01, H12, J11, W00	
12-71	Snoopy Display Program	A01, F02, W00	
12-72	Four-Point Smoothing with FPP-12	D01, J11	
12-73	8-Point Quadratic Smooth with FPP-12	A01, B05, J11	
12-74	*REGRES - Multiple Linear Regression	D01	
12-75	FORTRAN Subroutines for the PDP-12	D01, F02, G02	
12-76	TAPELOOK; CORELOOK; SEARCH	A01, J11, W00	
12-77	PAL12A Assembler	A01, B07, J11	
12-78	PUBPLOT	A01, B07, J11	
12-79	Modified ADTAPE	D01, F02, G02	
12-80	FOCAL - RT	A01, J11, W00	
12-81	VR12 SCOPE HANDLER FOR OS/8	A01, J11, W00	same LINCtape
12-82	LAP6-DIAL TO PS/8 SOURCE FILE CONVERTER	A01, J11, W00	
12-83	$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN	D01, G02	
12-84	AVERAGER	A01, J11, W00	
12-85	APOLLO 12	D01, G02	
12-86	ORGAN-AA and ORGAN+BA	D01, F02, G02	
12-87	ONDISK-OFFDISK	A01, J11, W00	
12-88	OCTALFPP	D01, G02	
12-89	BUTFLTR	A01, G02, W00	
12-90	REPRSNT	A01, G02, W00	
12-91	OCTPUNCH	A01, G02, W00	
12-92	PDP8TO12	D01, G02	
12-93	TRANS	D01, F02	
12-94	DATAN	A01, W00	
12-95	PDP-12 PS/8 Utility Programs	A01, J11, W00	
12-96A&B	SCOPE and CNGMWA	A01, J11, W00	
12-97	An Off-Line FOCAL-12 Program for Auto-Analyzers by TWX	D01	
12-98	HERALD - Analog-Digital Average and Standard Error Program	A01, B07, J11	
12-99	A Set of Spectral Programs	A01, J11, W00	
12-101	OS/8 SKED	A01, J11, W00	
12-102	A Manual for the PDP-12 Operator	A01, W00	
12-103	$HAPPY	D01, G02	

No.	TITLE	MEDIA/PRICE CODES
12-104	CORDATFP	A01, J11, W00
12-105	DATAFILE and DFUPDATE	A01, J11, W00 *
12-106	$PLOT	A01, J11, W00
12-107	AVUPT08, AVUPTO8S	A01, J11, W00
12-108	FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler	A01, F02, G08, W00
12-109A, B&C	QNANSWER, QANDATTY, SUPRSHUF	D01, J11
12-110	DIAL-MS for 1600 Blocks	A01, J11, W00 **
12-111a	ADFILE	A01, J11, W00
12-112	IDXRDD	D01, J11
12-113	IDXWT	D01, J11
12-114	FOCAL-PL	A01, J11, W00
12-115	PLOT 3D, Pseudo 3-Dimensional Perspective Display for the PDP-12	A01, J11, W00
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals	A01, B07, J11
12-117	TAPEDIT; A PDP-12 LINCTAPE EDITOR	D01, J11
12-118	Average Transient Advanced Programs	A01, J11, W00 *same LINCtape
12-119	Neurone Spike Train Analysis Programs	A01, J11, W00
12-120a	DUAL	A01, B12, J11 **
12-121	Arrhythmia Detection and Categorization	A01, B07, J11
12-122	PDP-12 User's Monitor Command	D01, J11
12-123a	OS/8 VR12 Handler	D01, F02, G02
12-124	FR, FIDS and FADC for PDP-12 Input/Output	D01, G02
12-125	Waveform Analysis	D01, J11
12-126	WAVEFORM: Evoked Potential Analysis	A01, B07, J11
12-128	GEP: A Generalized Experimental Package	A01, G06, W00
12-129	OS/12S Scope Monitor Operating System	A01, J11, W00
12-130	COMPARE - Fast LINCtape Compare	D01, J11
12-131	OS/8 DIBILD - Revised	A01, J11, W00
12-132	LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8, OS/12)	A01, J11, W00

* same LINCtape; includes 12-105, 12-118, 12-119.

** LINCtape contains 12-46, 47, 110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES	
12-133	MINT - Multiple Precision Integer Arithmetic Subroutine	A01, J11, W00	same LINCtape
12-134	RWDF32	A01, J11, W00	
12-135	MAC8, 8K MACRO ASSEMBLER	A01, J11, W00	
12-136	MOVE	A01, J11, W00	
12-137	PAL12D	A01, J11, W00	
12-138	ISEL	A01, J11, W00	
12-140	NAEP - Nerve Action and Evoked Potentials	A01, J11, W00	
12-141	$CORREL - Intercorrelation Program for 50 Variables	D01, G02, J11	
12-142	FOCALSD	D01	
12-143	DSLIS - Dead Start Loader and Index Statistics	A01, J11, W00	
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)	A01, J11, W00	
12-145a	CREFNMAP	A01, B07, J11 *	
12-146	$CORR (FOCAL Version)	D01, G02	
12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples	D01, G02	
12-148	STATIS12, A Statistical Package for the PDP-12	A01, B07, J11	
12-149	XPIP8: PDP-12 DECtape PIP	A01, F06, W00	
12-150	XPIP10: PDP-10 DECtape to LINCtape Converter	A01, F02, W00	Source avail. from Author
12-151	"PSYCHO", A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics	A01, B12, J11	
12-152	LOAD31K, A Loader for DIAL-MS and 32K of Core	D01, J11	*
12-153a	DUAL32, DUAL-28K Assembler	A01, J11, W00	
12-154a	CREF32	J11, W00, Y00	
12-155	MARK12X0	J11, W00, Y00	
12-156	MUSIC12	D01, J11	
12-157	PLOTVS, Device Independent Graphics	D01, J11	
12-158	FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's	D01, J11	
12-159	PLAYBOY	D01, J11	
12-160	CCTGEN - Carriage Control Tape Generator	D01, J11	
12-161	BIGCHARS	D01, J11	

* same LINCtape; contains 12-46, 47, 110, 120a, 145, 152, 153, 154, 155.

No.	TITLE	MEDIA/PRICE CODES
12-162	COREDIT	D01, J11
12-163	AD74 - High Speed Analog to Digital Conversion Program	D01, J11
12-164	DIAL.EXT	A01, B13, J11
12-165	NAP SYS: Program to Analyze Neuronal Spike Data	A01, B13, J15
12-166	OS/8-VC12 Display Device Handler for the PDP-12	D01, G02
12-167	FOCAL Patches	D01
12-168	Spectral Analysis System	A01, J11, W00
12-169	HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12	A01, J11, W00 ┐ same LINCtape
12-170	INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12	A01, J11, W00 ┘
12-171	Three Patches to the Clinical Lab-12 System	D01, J11, Z00
12-172	WVU Utility Package	A01, J11, W00
12-173	SCOPEFOCAL	D01, J11
12-174	CLOCK: Digital Clock with Westminster Chimes	A01, J11, W00
12-175	PLOTZER	D01, J11
12-176	FOCAL-12 Overlay to Access the DF32 Disk	D01, G02
12-177	TENNIS	D01, G02
12-178	NUFOCAL, Modified FOCAL-12	D01, G02
12-179	The Mann-Whitney U Test	D01, G02
12-180	CARDDIAL - Input to the DIAL Editor Via Cards	J11, W00, Z00
12-181	ATSXL - Text Display and Timing Routine for FOCAL-RT	D01, J11 ┐
12-182	KLK - A Simple Clock Overlay for PDP-12 FOCAL	D01, J11 ├ same LINCtape
12-183	DECIO - FOCAL-12 Whole Word Digital I/O Overlay	D01, J11 ┘
12-184	PPSH - Neuronal Autocorrelation and Cross-correlation Analysis Programs	A01, J11, W00
12-185	Horoscope Casting Routines - Astrodynamical Subroutines	D01, J11 ┐ same
12-186	COBRA Assembler for the PDP-12	A01, J11, W00 ┘ LINCtape
12-187	OS/8 Device Handlers for PDP-12 Core	A01, J11, W00, Z00
12-188	4K DISK/LINCTAPE MONITOR	A01, J11, W00, Z00
12-189	DECtape Reader Handler for PDP-12	D01, G02
12-190	PDP-12 Functions for OS/8 BASIC	A01, B07, J11, X00
12-191	MTXIO - Multitasking Executive	A01, B12, J11
12-192	ASFLO - Packed ASCII to Floating Point Format Conversion	A01, J11, W00

No.	TITLE	MEDIA/PRICE CODES	
12-193	A Set of FORTRAN Callable DF-32 Routines for the PDP-12	D01, G02	
12-194	Split Plot Factorial Analysis of Variance - % SPFAV	D01, G02	
12-195	TRIGSYS - A Multichannel, Fast Point Process Data Acquisition	A01, J11, W00, Z00	
12-196	TRALIB - Point Process Data Library and Editor	J11, W00, Z00	same LINC-tape
12-197	SUPRQA - Super QANDA	J11, W00, Z00	
12-198	BURST, V2 - A Point Process High-Pass Filter	A01, J11, W00, Z00	
12-199	CPRINT.SB: Utility Subroutines for a Centronics 101A Printer	D01, G02	
12-200	MULT-PS2: Multiple Printing Source Program	A01, J11, W00	
12-201	DPSPV3: Double Precision to Single Precision Integer Converter	A01, B07, F02, G06, J11	
12-202	PLOT8CH: 3-Dimensional Plotting of EEG Data	A01, B07, J11	

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-1	$ NC	$	$	$	$	$	$ 8.	$ 18.	$	$	1 LTA
12-2	1.*						8.	18.			1 LTA *NC with Tape
12-4	NC						8.	18.			1 LTA
12-5	NC			NC			8.	18.			1 LTA
12-6	NC			10.			8.	18.			1 LTA
12-7	NC						8.	18.			Same LTA (1)
12-8	NC						8.	18.			
12-9	NC			10.			8.	18.			1 LTA
12-10	NC			NC			8.	18.			1 LTA
12-11	NC			NC			8.	18.			1 LTA; also contains 12-15
12-12	NC						8.	18.			1 LTA
12-13	NC			NC			8.	18.			1 LTA (obj)
12-14	NC			NC			8.	18.			1 LTA
12-15	NC			NC			8.	18.			1 LTA; also contains 12-11
12-16	NC	2.	2.	NC							
12-17	NC			NC			8.	18.			
12-18	NC	2.	2.	NC							
12-20	NC	2.	2.								
12-21	NC	2.									
12-22	NC			10.			8.	18.			Same LTA (1)
12-23	NC			10.			8.	18.			
12-24	NC			NC			8.	18.			1 LTA
12-25	NC						8.	18.			1 LTA
12-29			8.								
12-30	NC			10.			8.	18.			1 LTA (bin, LAP6)
12-31	NC			20.			8.	18.			1 LTA (bin, LAP6)
12-32	NC			10.			8.	18.			1 LTA (bin, DIAL)
12-33	NC			5.			8.	18.			1 LTA (bin, LAP6, DIAL)
12-34	1.$						32.	72			4 LTA *NC with tapes
12-35	NC						8.	18.			1 LTA
12-36	NC						8.	18.			Same LTA (1)
12-37	NC						8.	18.			
12-38A	NC			NC			8.	18.			Same LTA (1)
12-38B	NC			NC			8.	18.			
12-39	NC						8.	18.			1 LTA
12-40	NC						8.	18.			1 LTA
12-41	NC	2.	8.								

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-42	$ NC	$	$	$ 5.	$	$	$ 8.	$ 18.	$	$	1 LTA (obj)
12-43	NC						8.	18.			Same LTA (1) (obj,src)
12-44	NC						8.	18.			
12-45	NC						8.	18.			1 LTA (obj,src)
12-46	NC						8.	18.			Same LTA (1) ; also contains
12-47	NC						8.	18.			12-110,120a,145,152,153,154,155
12-48	NC			10.			8.	18.			1 LTA
12-49	NC			NC			8.	18.			1 LTA
12-50							8.	18.			1 LTA
12-51	NC			10.			8.	18.			1 LTA
12-52	NC		2.								
12-53	NC		2.								
12-54	NC			10.			8.	18.			1 LTA
12-55	NC	2.	2.	NC							
12-56	NC			5.			8.	18.			Same LTA (1)
12-57	NC			5.			8.	18.			
12-58	NC			NC							
12-59	NC			NC			8.	18.			1 LTA
12-60	NC			NC			8.	18.			1 LTA
12-61	NC			NC							
12-62	1.*						8.	18.			1 LTA *NC with tape
12-63	NC						8.	18.			1 LTA
12-64	NC		2.	NC							
12-65	NC						8.	18.			1 LTA
12-66	NC						8.	18.			1 LTA
12-67	NC			NC			8.	18.			1 LTA
12-68	NC			10.			8.	18.			1 LTA
12-69	NC			NC			8.	18.			1 LTA
12-70	NC				8.	20.	8.	18.			1 LTA; 1 DTA for PDP-8 users
12-71	NC	2.									
12-72	NC			NC			8.	18.			1 LTA
12-73	NC			5.			8.	18.			1 LTA
12-74	NC			NC							
12-75	NC	2.	2.	NC							
12-76	NC						8.	18.			1 LTA
12-77	NC			10.			8.	18.			1 LTA
12-78	NC			10.			8.	18.			1 LTA

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-79	$ NC	$ 2.	$ 2.	$ NC	$	$	$	$	$	$	
12-80	1.*						8.	18.			1 LTA *NC with tape
12-81	NC						8.	18.			Same LTA (1) (obj,src)
12-82	NC						8.	18.			
12-83	NC		2.	NC							
12-84	NC						8.	18.			1 LTA
12-85	NC		2.	NC							
12-86	NC	2.	2.	NC							
12-87	NC						8.	18.			1 LTA
12-88	NC		2.	NC							
12-89	NC		2.								
12-90	NC		2.								
12-91	NC		2.								
12-92	NC		2.	NC							
12-93	NC	2.		NC							
12-94	NC										
12-95	NC						8.	18.			1 LTA
12-96A&B	NC						8.	18.			1 LTA
12-97	NC			NC							
12-98	NC			10.			8.	18.			1 LTA (obj,src)
12-99	NC						8.	18.			1 LTA (obj,src)
12-101	NC						8.	18.			1 LTA (obj,src)
12-102	NC										
12-103	NC		2.	NC							
12-104	NC						8.	18.			1 LTA (obj,src)
12-105	NC						8.	18.			1 LTA (Sys src) contains 12-118,119
12-106	NC						8.	18.			1 LTA (obj,src)
12-107	NC						8.	18.			1 LTA (obj,src)
12-108	NC	2.	12.								
12-109A,B,C	NC			NC			8.	18.			1 LTA
12-110	NC						8.	18.			1 LTA (obj) contains 12-46,47,
											120a,145,152,153,154,155
12-111a	NC						8.	18.			Same LTA (1) (obj,src)
12-112	NC			NC			8.	18.			
12-113	NC			NC			8.	18.			
12-114	NC						8.	18.			1 LTA (obj,src)
12-115	NC						8.	18.			1 LTA (obj,src)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-116	$ NC	$	$	$ 10.	$	$	$ 8.	$ 18.	$	$	1 LTA (obj,src)
12-117	NC			NC			8.	18.			1 LTA (obj,src)
12-118	NC						8.	18.			Same LTA (1) (obj,src); also
12-119	NC										contains files for 12-105
12-120a	NC			20.			8.	18.			1 LTA(obj,src); also contains 12-46,
											12-47,110,145,152,153,154,155
12-121	NC			10.			8.	18.			1 LTA (obj,src)
12-122	NC			NC			8.	18.			1 LTA
12-123a	NC	2.	2.	NC							
12-124	NC		2.	NC							
12-125	NC			NC			8.	18.			1 LTA (obj,src)
12-126	NC			10.			8.	18.			1 LTA (obj,src)
12-128	NC		8.								
12-129	NC						8.	18.			1 LTA (obj,src)
12-130	NC			NC			8.	18.			1 LTA (src)
12-131	NC						8.	18.			1 LTA (obj,src) (See 8-599)
12-132	NC						8.	18.			1 LTA (obj,src) (See 8-628)
12-133	NC						8.	18.			Same LTA (1); (obj,src)
12-134	NC						8.	18.			See also 8-631 thru 8-635
12-135	NC						8.	18.			
12-136	NC						8.	18.			
12-137	NC						8.	18.			
12-138	NC						8.	18.			
12-139	NC						8.	18.			1 LTA (obj,src)
12-140	NC						8.	18.			1 LTA (obj,src)
12-141	NC		2.	NC			8.	18.			1 LTA (obj) ; Order ASCII or LTA
12-142	NC			NC							
12-143	NC						8.	18.			1 LTA (obj,src)
12-144	NC						8.	18.			1 LTA (obj,src)
12-145a	NC			10.			8.	18.			1 LTA ;also contains 12-46,47,
											110,120a,152,153,154,155
12-146	NC		2.	NC							
12-147	NC		2.	NC							
12-148	NC			10.			8.	18.			1 LTA (obj)
12-149	NC	8.									
12-150	NC	2.									Src available from author
12-151	NC			20.			8.	18.			1 LTA (obj,src)

N/C - No Charge

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DEC 7-(369)-1112A-R1074

DECUS SERVICE CHARGES

NOTE: WRITE-UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-152	$ 1.	$	$	$ Inc.	$	$	$ 8.	$ 18.	$	$	Same LTA (1) (obj,src); contains
12-153a	1.						8.	18.			12-46,47,110,120a,145 also
12-154a							8.	18.			
12-155							8.	18.			
12-156	1.			Inc.			8.	18.			1 LTA (obj,src)
12-157	1.			Inc.	8.	20.	8.	18.			1 LTA OS/12; 1 DTA OS/8
12-158	1.			Inc.			8.	18.			1 LTA (obj,src)
12-159	1.			Inc.			8.	18.			1 LTA (obj,src)
12-160	1.			Inc.			8.	18.			1 LTA (obj,src)
12-161	1.			Inc.			8.	18.			1 LTA (obj,src)
12-162	1.			Inc.			8.	18.			1 LTA (obj,src)
12-163	1.			Inc.			8.	18.			1 LTA (obj,src)
12-164	1.			25.			8.	18.			1 LTA (obj,src)
12-165	1.			25.			16.	36.			2 LTA (obj,src)
12-166	1.		2.	Inc.							
12-167	1.			Inc.							
12-168	1.						8.	18.			1 LTA (obj,src)
12-169	1.						8.	18.			Same LTA (1) (obj,src)
12-170	1.						8.	18.			
12-171	1.			Inc.			8.	18.			1 LTA (src,doc)
12-172	1.						8.	18.			1 LTA (obj,src)
12-173	1.			Inc.			8.	18.			1 LTA (obj,src)
12-174	1.						8.	18.			1 LTA (obj,src)
12-175	1.			Inc.			8.	18.			1 LTA (src)
12-176	1.		2.	Inc.							
12-177	1.		2.	Inc.							
12-178	1.		2.	Inc.							
12-179	1.		2.	Inc.							
12-180	On tape						8.	18.			1 LTA (src,bin,write-up)
12-181	1.			Inc.			8.	18.			
12-182	1.			Inc.			8.	18.			Same LTA (1) (obj,src)
12-183	1.			Inc.			8.	18.			
12-184	1.						8.	18.			1 LTA (src)
12-185	1.			Inc.			8.	18.			Same LTA (1) (obj,src)
12-186	1.						8.	18.			
12-187	1.						8.	18.			1 LTA (src,doc,routines)
12-188	1.						8.	18.			1 LTA (obj,src,doc)

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

DECUS SERVICE CHARGES

NOTE: WRITE- UP CHARGE DOES NOT APPLY WHEN CORRESPONDING MEDIA IS ORDERED

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING	DECTAPE		LINCTAPE		MAGTAPE		OTHER INFORMATION
		BIN	ASCII		U/S	D/S	U/S	D/S	U/S	D/S	
12-189	$ 1.	$	$ 2.	$ Inc.	$	$	$	$	$	$	
12-190	1.			10.			8.	18.			1 LTA (bin,src,listing,functions)
12-191	1.			20.			8.	18.			1 LTA (obj,src)
12-192	1.						8.	18.			1 LTA (obj,src)
12-193	1.		2.	Inc.							
12-194	1.		2.	Inc.							
12-195	1.						8.	18.			Same LTA (1) (obj,src,doc)
12-196	On tape						8.	18.			
12-197							8.	18.			
12-198	1.						8.	18.			
12-199	1.		2.	Inc.							
12-200	1.						8.	20.			
12-201	1.	2.	8.	10.			8.	20.			
12-202	1.			10.			8.	20.			

INC - Included with write-up

U/S - User Supplied Tape (Certified)

D/S - DECUS Supplied Tape

For information not contained on this sheet see General Information

There are four Library LINCtapes of PDP-12 programs. Contents of tapes and applicable Service Charges are:

TAPE	DECUS NO's	USER TAPE	DECUS TAPE
1	12-1, 2, 4	$15.00	$25.00
2	12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	35.00	45.00
3	12-22, 23, 25, 30, 31, 32, 33 35, 36, 37, 41, 42, 43, 44	35.00	45.00
4	12-45, 46, 47, 51, 54, 55, 56, 57	25.00	35.00

Library Tapes previously ordered will not be automatically updated.

GENERAL INFORMATION

All DECUS service charges are to help defray the cost of reproduction, handling and postage. All orders must be accompanied by cash, DECUS Coupons or Purchase Order. Please make checks payable to DECUS.

Because of the difficulties encountered by many installations in obtaining Purchase Orders for small amounts, DECUS Coupons may be ordered for any amount and used as subsequent payment for DECUS services. Coupons are available in $1.00 and $5.00 denominations. They may be ordered as DECUS NO. 0051.

Payment for DECUS Coupons must be made in advance. Purchase Orders for coupons must be paid before coupons can be issued.

All charges are in U. S. dollars, and are subject to change without notice.

European Users - Payment may be made, in your currency, to: Martha Ries, Digital Equipment Co., Int'l-Europe, 81 Route de L'Aire, 1227 Carouge/Geneva, Switzerland. Please refer to currency exchange charts available from that office.

Service charge for DECUS Proceedings is:

Attendees - First copy free, additional copies $5.00 each
Non-attendees - $5.00 per copy

Charges for DECUS three-ring binders are:

One inch (1") Black Program Library Catalog Binder - $2.50
Two inch (2") Blue general DECUS binder - $3.50

When a large number of write-ups is ordered, but does not constitute a complete library, a service charge of 15¢ per write-up will apply.

Currently there are four (4) library LINCtapes of PDP-12 programs available from DECUS. Service charges for these tapes are:

Tape #1	DECUS NO's. 12-1, 2, 4	$10.00 on user supplied LINCtape $20.00 on DECUS supplied LINCtape
Tape #2	DECUS NO's. 12-5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20	$30.00 on user supplied LINCtape $40.00 on DECUS supplied LINCtape
Tape #3	DECUS NO's. 12-22, 23, 25, 30, 31, 32, 33, 35, 36, 37, 41, 42, 43, 44	$30.00 on user supplied LINCtape $40.00 on DECUS supplied LINCtape
Tape #4	DECUS NO's. 12-45, 46, 47, 51, 54, 55, 56, 57	$20.00 on user supplied LINCtape $30.00 on DECUS supplied LINCtape

Available write-ups are supplied, at no charge, for each library tape issued.

A complete library of all current DECUS PDP-12 write-ups is available at a service charge of $15.00

DECUS NO. 12-1

EEG Data Collection (BNI Series)

Dr. Grey Walter
Submitted by: Marty Kaye, Digital Equipment Corporation, Maynard, Massachusetts

These programs acquire and manipulate analog data for neurological applications. Data storage and hard copy (plotter) facilities are part of the package.

Minimum Hardware: 4K PDP-12A and KW12 for some programs, and XY 12 plotter
Source Language: LAP6-DIAL

DECUS NO. 12-2

PDP-12 Utility and Data Reduction Programs

Donald Overton, Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

This tape contains a variety of programs written for the classic LINC or LINC-8 which have been modified to run in the PDP-12. Included are data reduction programs which perform autocorrelation, fourier analysis, power spectral analysis and convolution. Utility programs allow selected blocks of LINCtape to be searched, compared or typed out. Also included are programs which allow the user to convert LAP4 or LAP6 manuscripts into LAP6-DIAL, or to disassemble binary code into LAP6 or LAP6-DIAL source. None of these programs were written by the current author, who has simply modified them for operation under LAP6-DIAL in the PDP-12.

Source Language: LAP6-DIAL

DECUS NO. 12-3

Obsolete

DECUS NO. 12-4

IRDA

David Ferrarini, Digital Equipment Corporation, Maynard, Massachusetts

The IRDA (infra-red data acquisition) program acquires asynchronous data from an interfaced instrument, displays the data on the scope, and stores it on LINCtape. IRDA is compatible with any device that transmits X-Y data at a rate as fast as 103 milliseconds/point and accepts up to a maximum of 1000_{10} data points. The external asynchronous device is interfaced to the PDP-12 computer by two potentiometers, one transmits X axis input (independent variable), the other transmits Y axis input (dependent variable). For every one bit increment in the X axis, IRDA retrieves one value from the Y pot and stores it in the data area. For example, IRDA can generate an absorption spectrum from an infra-red spectrophotometer.

Minimum Hardware: PDP-12A with KW12A clock
Other Programs Needed: LAP6-DIAL
Source Language: FORTRAN

DECUS NO. 12-5

SERCHPRO

Jean Champarnaud, Digital Equipment Corporation, Maynard, Massachusetts

Basically, this program does two things: 1. Tells the user the starting block number and the number of blocks of any binary file saved on a DIAL tape. 2. Indicates the starting mode (LINC or 8), starting address and actual memory locations into which the program will be loaded.

Source Language: LAP6-DIAL

DECUS NO. 12-6

ANDIP - Analog Digital Interchange Program

C. J. Thompson, D. Skuce, Montreal Neurological Institute, Montreal, Canada

ANDIP will transfer analog data between the analog to digital converter, the LINCtape or the PEC IBM compatible tape and the PDP-12 display, incremental plotter or the Tektronix graphics terminal. Up to 16 channel data may be transferred. Three of the analog knobs are used to control the presentation of the data on the display and graphic output devices. The data can be edited from LINCtape. A display of the input data is available during analog to digital conversion.

Storage Requirement: 0-1777, 4000-5400
Source Language: LAP6-DIAL

DECUS NO. 12-7

DBLFLT - Double Float Mathematical Routines

Donald A. Overton, Ph.D., Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

The DBLFLT routines are LINC mode programs which perform mathematical operations using a double precision mantissa and a 12-bit exponent to obtain an effective accuracy of about 7 decimal digits. The program DBLFLT by Michael McDonald and an altered version called DBLFLT1 each require two quarters of memory and provide the basic mathematical operations (add, subtract, multiply, divide, fix, float). A larger routine called DBLFLT3 is derived from DECUS NO. L-68. It occupies seven quarters of memory located outside the current instruction field and provides a variety of commonly used

DECUS NO. 12-7 (Continued)

mathematical functions (square root, sine, cosine, log, arctangent, etc.) as well as routines for teletype input and output.

Source Language: LAP6-DIAL

DECUS NO. 12-8

Teletype Conversion Routines

Donald A. Overton, Ph.D., Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania

These routines provide various types of conversion from ASCII teletype code to binary, and vice versa. By using the appropriate routine, 1-8 octal or decimal digits may be converted from ASCII to single or double precision binary, and conversely. Some routines can search and decode QANDA answer fields. Most routines are by D. J. Nichols and have previously been circulated for use with LINC keyboard codes (DECUS NO. L-46 to L-50).

Source Language: LAP6-DIAL

DECUS NO. 12-9

SLOWCREF

John Burness, Digital Equipment Corporation, Maynard, Massachusetts

Revised tape by: Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York 4/6/73

SLOWCREF is a modified version of the PDP-12 cross-reference program, CREF 12 (DEC-12-FRZA-D), and is used for the special case when a cross-reference of a long system program (e.g. PIP) is needed. CREF 12 is designed to be run on an 8K machine, thereby limiting the size of a program which it can successfully cross-reference. SLOWCREF runs on a 16K machine, thus doubling the size of the program which can be cross-referenced. Because the symbol table crosses field boundaries when doing searches and inserts, SLOWCREF runs from 4 to 8 times slower than CREF 12 on the same program. Therefore, if the user's source is less than about 200 blocks, try to use CREF 12 to cross-reference the program first, rather than SLOWCREF.

Restrictions: Must operate under DIAL-MS
Source Language: LAP6-DIAL

DECUS NO. 12-10

FOCAL Library (LINCtape FOCAL for the PDP-12)

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

This is a 4K FOCAL library system to call FOCAL programs from LINCtape. Up to $62_{(10)}$ programs may be stored on one tape. An index routine may be called which displays the index of the library. Through this program the index may be updated and new programs added to the system.

Source Language: LAP6-DIAL

DECUS NO. 12-11

ODTAPE (Octal Debugging for the PDP-12 LINCtape)

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

This is a utility routine for scanning blocks of LINCtape. The operator may choose to list the block in total, line by line, or word by word. He may also scan the block for a certain word or change the contents of a word or group of words. It is an aid in debugging tapes, bypassing the error-prone switch method.

Storage Requirement: Page 0, Page 1, 1000-1546, 4400-4777
Restrictions: Operates on units 0 and 1 only
Miscellaneous: Starts at 0200 in PDP-8 mode
Source Language: LAP6-DIAL

DECUS NO. 12-12

8TO12 File Converter

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

8TO12 allows the user to read PDP-8 DECtape source files created by the 4K PDP-8 Disk Monitor System (versions 8G, AE, AF) and output them directly to a PDP-12 DIAL tape, utilizing the TC12-F hardware option. Both input and output files may be specified by names and all the necessary corrections in text packing are performed.

Restrictions: Will only operate on a PDP-12 with TC12-F hardware option
Source Language: DIAL

DECUS NO. 12-13

RDPEC: PEC Synchronous Tape Read Program

Joyce L. Kerr, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania

RDPEC will read and interpret a 9-channel digital tape from a PEC synchronous tape transport. Although it is designed primarily for reading EBCDIC or binary records on IBM 360-compatible tapes, the program can also be used to determine record lengths, locate tape (EOF) marks, and check for tape errors on any odd parity, high density tape.

Minimum Hardware: PDP-12A; PEC 9-channel synchronous tape transport with TR04A tape controller
Source Language: LAP6-DIAL

DECUS NO. 12-14

MUL-2REG

Richard W. Baker, Iowa State University, Ames, Iowa

MUL-2REG provides the user with an integer multiply subroutine capable of multiplying the contents of 2 registers (each register may contain values up to ± 3777) resulting in a signed double register product. With the hardware integer multiply the product must not exceed the capacity of a single register. If overflow does occur the most significant high order bits are lost and the user will be unaware of this fact since the overflow indicator is not triggered by 'MUL.' MUL-2REG bypasses the above stringent restrictions and pitfalls of the hardware integer multiply.

Storage Requirement: 75 Octal Registers (61 Decimal)
Source Language: LAP6

DECUS NO. 12-15

HISTO12

Roger A. Nace, University of Washington, Anesthesia Research Center, Seattle, Washington

HISTO12 is an interspike interval plotting routine. The program uses an adjustable threshold to discriminate against baseline noise and will eliminate spikes shorter than 500 μ's or longer than 2.1 ms. A limit to the number of spikes counted may be selected. Printed output consists of sampling diagnostics, total spikes counted, the average input frequency, total time in sampling, and number of spikes not appearing in the display. The display in either scattergram or histogram mode may be expanded horizontally defining intervals of 0.0 to 0.2 to 0.0 to 1.6 seconds. Vertical scaling is accomplished by addition, subtraction or by multiplication, division. Complete operating instructions type out upon program startup.

Source Language: LAP6-DIAL

DECUS NO. 12-16

MODCLK

Stephen J. Mayor, Medical College of Ohio at Toledo, Toledo, Ohio

This program is used as a test of the KW-12 clock which uses the sense switches and Teletype. Each sense switch corresponds to a particular clock frequency and depressing a switch causes the Teletype bell to ring at a certain rate as follows: SNSØ, 1ØØHz, 1/SEC . SNS1, 1KHZ, 1/2SEC; SNS2, 10KHZ, 1/4 SEC; SNS3, 100 KHZ, 1/6 SEC; SNS4, 400 KHZ, 1/8 SEC.

Minimum Hardware: 4K PDP-12A and KW-12 clock
Storage Requirement: 242 Octal locations
Source Language: LAP6-DIAL

DECUS NO. 12-17

DIALRFØ8

Gary B. Jennings, Digital Equipment Corporation, Maynard, Massachusetts

RFØ8 DISKØ is loaded from LINCtape units Ø and 1. Tape motion is not interrupted by disk transfers, as tape is read and the disk is written simultaneously. Maximum rate of transfer is obtained and only two blocks of tape are used for program and error subroutine storage.

Source Language: LAP6

DECUS NO. 12-18

"FAILSAFE"

Gary B. Jennings, Digital Equipment Corporation, Northbrook, Illinois

This program is a failsafe method of copying one LINCtape onto another. It is almost essential in critical applications such as "CLINILAB" to insure that tapes have been duplicated exactly with zero chance of error.

Minimum Hardware: 8K
Source Language: LAP6

DECUS NO. 12-19

DIBOL-12 (PDP-12 Addendum for DIBOL III System User's Guide (DECUS NO. 8-337))

Program is exactly as described in write-up for DECUS NO. 8-337 with the addition of an instruction sheet for PDP-12 usage and a system LINCtape.

Source Language: PAL-10

DECUS NO. 12-20

FORMATXT

G. C. Ongley, Medical Research Council, Greylingwell Hospital, Chichester, Sussex, England

Used instead of PIP, FORMATXT loads and tabulates a source paper tape which has been punched off-line and so does not have formatted text as given by DIAL's EDITOR. DIAL-acceptable start and end codes are added, and the program exits to DIAL EDITOR.

Source Language: LAP6-DIAL

DECUS NO. 12-21

Modified MAGSPY

Lawrence Moss, University of Vermont, College of Medicine, Burlington, Vermont

MAGSPY is in the DEMO monitor. Addition of an octal

DECUS NO. 12-21 (Continued)

display of data, CR to restart DIAL, startup with the request for block number and unit, and display movement controlled by knob 4 make this modification different.

Minimum Hardware: PDP-12A, (LINCtapes, A/D scope)
Source Language: DIAL - patched

DECUS NO. 12-22

PLOTFFT

J. R. Mason, U.C.L.A. Brain Research Institute, Los Angeles, California

PLOTFFT reads the LINCtape created by the CFFT program (DECUS NO. 12-23) and plots a graph of the auto spectra on a digital plotter.

Minimum Hardware: PDP-12 with 8K memory, LINCtapes, Digital Plotter (0.01 in/step)
Source Language: LAP6

DECUS NO. 12-23

CFFT

J. R. Mason, U.C.L.A. Brain Research Institute, Los Angeles, California

This is a modification of the LINC Spectrum Program (DECUS NO. L-25) for use on the PDP-12. It eliminates the use of LINCtape for intermediate storage, calculations and overlays, but keeps the basic memory block structure of the previous program. All of the program resides in core. As before, the epoch is fixed at 1792 samples. However, the program samples continuously, calculates the spectra of the 17.5 second (1792 samples) epochs and writes the CALCULATED SPECTRA values on LINCtape unit 1 in double precision format.

Minimum Hardware: PDP-12 with 8K memory, LINCtapes, KW-12 clock
Source Language: LAP6

DECUS NO. 12-24

Overlays to FOCAL-12

Submitted by: Marty Kaye, Digital Equipment Corporation, Maynard, Massachusetts

This is a series of overlays for FOCAL-12, by various authors, combined on one LINCtape and distributed as one document. Present routines include: FOCAL-12K; $TEXT; $SNS; $RELAY, $LPØ8; $DEVICE; $PLOT, $ECHO & $ECHOFN; $CHARSIZ, $DTOA.

Source Language: LAP6-DIAL

DECUS NO. 12-25

Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C

R. E. Kingsley, Indiana University, Bloomington, Indiana

FRACUS extracts decimal integer or fraction input from QANDA answer field and places floating point equivalent in user defined output field.

SCRMBL extracts octal or decimal integer input from QANDA answer fields and places the octal equivalent in user defined output field.

QANDA-C allows the decoding of the "CONTROL" character by QANDA.

Source Language: DIAL-MS

DECUS NO. 12-26

DATAFILE

Dr. C. M. Malpus, University of Leeds, Leeds, England

DATAFILE is a LINCtape based interactive library designed primarily as a transparent system by which data from a user program can easily be stored, edited and retrieved. The only addition needed to any user program is a short loader routine, and when the user program is restored to core, the contents of only one register (location 17) are changed from what they were before the loader was entered.

Binary programs can also be stored and DATAFILE can act as a free-standing library system, started (like LAP6) from console procedure and capable of loading and starting binary programs on file within it.

DATAFILE thus takes over the binary library and loading facilities of LAP6, and can additionally be called from (and exit to) user programs to file resultant data. Because of its compactness compared with LAP6, and its increased file and index space, it is much more efficient, as well as easier to use, than LAP6 for debugged, operational programs and routines.

The 4K LINC-8 version of DATAFILE (issue dated 7/7/70) can operate from tape units 0, 1, 4 and 5 and can file and retrieve data from any unit. Data can be filed and retrieved, or programs loaded into memory banks 1, 2 and 3. A version of DATAFILE for the PDP-12 is under development which will have no core size limitations.

Source Language: LAP6

DECUS NO. 12-27

LOADBIN

Dr. C. M. Malpus, University of Leeds, Leeds, England

LOADBIN is a utility program for use with the DATAFILE library system and is the means by which binary programs (as opposed to binary data) can be handled by DATAFILE. Binary programs written on LINCtape are filed on a DATAFILE tape by LOADBIN, which makes all necessary transfers, index-

SEE L14A
SEE L14B

DECUS NO. 12-27 (Continued)

updating and file sorting. Once programs are filed by LOADBIN, DATAFILE will retrieve and load them into absolute locations and start at any address.

Sourge Language: LAP6

DECUS NO. 12-28

DXCREATE

Dr. C. M. Malpus, University of Leeds, Leeds, England

DXCREATE is a utility program for use with the DATAFILE library system. It is used for repairing damaged DATAFILE library indexes, and for the creation of indexes with arbitrary or non-standard contents. All necessary manipulations of the index are carried out by DXCREATE, but the files whose details are contained within the index are unaffected.

Source Language: LAP6

SEE L-124C

NOTE FOR 12-26, 12-27, 12-28: The programs previously assigned these numbers were really LINC8 programs and were placed in this section of the catalog in error. See L-124A,B &C.

DECUS NO. 12-29

LINC-10

Juergen Klauske, Digital Equipment GmbH, Hannover, Germany

This is a set of FORTRAN callable functions and subroutines to operate the following PDP-12 options: A/D Converter, Display, Left Switches, Relays, LINCtape (Block oriented, unformatted I/O).

Source Language: SABR

(NOTE: No documentation available, tapes only. (See Price List)

DECUS NO. 12-30

TDUMP

S. G. Wellcome and D. F. Pavlock, Digital Equipment Corporation, Maynard, Massachusetts

This tape dump program allows the programmer to print out the contents of any block of his LINCtapes or disk. The output will be printed on any of the following three printers: Teletype, LPØ8 printer, LP12 printer. The program is a standard load and go LAP6-DIAL binary. All input information is via a standard QANDA frame. All I/O is buffered and the tape runs in NOPAUSE mode. The output printed is the octal contents of each block.

Other Programs Needed: DIAL-MS
Storage Requirement: 8K
Source Language: LAP6-DIAL

DECUS NO. 12-31

DCON-1Ø

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

DCON-1Ø allows the user to read and write PDP-10 DECtape source files on a PDP-12 equipped with the TC-12F hardware option. All necessary index handling is performed. Binary files produced by PAL1Ø or PAL12 may be transferred to the DIAL binary working area or punched on paper tape.

Minimum Hardware: 8K PDP-12 with two LINCtape drives and TC12 hardware option
Other Programs Needed: DIAL-MS
Source Language: LAP6-DIAL

DECUS NO. 12-32

COMPAR12

D. F. Pavlock and S. G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

COMPAR12 allows the user to compare either source or binary DIAL files by name, or specified blocks of tape or disk by absolute block numbers. Any discrepancies are displayed on the scope. With 8K, the comparison is done 1Ø blocks at a time. If 12K is available, it is done 2Ø blocks at a time.

Other Programs Needed: DIAL-MS I/O routines
Storage Requirement: 8K
Source Language: LAP6-DIAL

DECUS NO. 12-33

KWANDA

Gene Kwatny, Krusen Research Center, Temple University, Philadelphia, Pennsylvania

KWANDA provides several additions to QANDA (DEC-12-FISA) for text display and input/output. KWANDA need reside in only one segment and may be accessed from any other. The Teletype I/O routines may be called from any segment. The number of digits in the answer field is extended to 99 and control-characters may be utilized.

Minimum Hardware: PDP-12A
Other Programs Needed: Refer to QANDA (DEC-12-FISA)
Storage Requirement: $1ØØØ_8$
Source Language: LAP6-DIAL

DECUS NO. 12-34

STAP-12

Urs R. Wyss, University of Zurich, Zurich, Switzerland

An open ended library system for neuronal spike train analysis is presented. It provides for: 1) Assimilation of event/time data (spikes), 2) Data management of digitalized spike trains, 3) Off-line analysis of spike trains (histograms, correlograms, etc.), 4) Output drivers (display, plotter).

Minimum Hardware: 8K PDP-12, KW12, EAE (KE12)
Restrictions: Does not run under LAP6-DIAL or DIAL-MS
Source Language: Mixed Mode PDP/LINC Assembler

DECUS NO 12-35

Bioelectric Signal Sorter (JULIA)

Vratislav J. Prochazka, University of Ulm, Ulm, West Germany

This program provides a means for the automatic sorting and time analysis of biological action potentials. Unit recognition is achieved by a template-matching technique with semi-automatic handling of interference potentials, ensuring a very reliable sorting.

Minimum Hardware: PDP-12 with A/D, VR12 Display, Basic LINCtape System, 8K Memory, ASR33, KW12, KE12
Source Language: LAP6

DECUS NO. 12-36

Hangman for PDP-12

Jud Gilbert, Florida State University, Tallahassee, Florida

This word game is based on the pencil and paper stick figure drawing game. One player types in a book title and a clue. Another player guesses letters. Six incorrect guesses loses.

Minimum Hardware: PDP-12, LINCtape, Scope
Storage Requirement: 1024 words
Source Language: DIAL

DECUS NO. 12-37

ODCAD (Octal to Decimal Conversion and Display)

Jud Gilbert, University of Florida, Tallahassee, Florida

The purpose of this program is to convert 11 bit signed (octal) numbers to decimal numbers and display them on the VR12 scope suppressing leading zeros, with or without decimal point.

Minimum Hardware: PDP-12, Scope, LINCtape
Storage Requirement: 242_8 locations
Source Language: DIAL

DECUS NO. 12-38A

Histogram and One-Factor Analysis of Variance

Mary Kathleen Fairbanks, Neuropsychology Research, Veterans Administration Hospital, Sepulveda, California

The program performs three primary functions which may be executed singly or in any desired combination, i.e. data storage, histogram construction and analysis of variance computation. Accepts integer data entered via teletype and stores these data on LINCtape using the DIAL index. Displays a histogram of the integers on request using the PDP-12 scope. Displays minimum, second smallest, second largest and maximum values of the data array. Computes either a one-factor repeated measures or a one-factor completely randomized analysis of variance on the data if requested. This program package is composed of the following program segments: $ANOVA, $HISTGM, $INT, $GPH, %AV, %2AV, %3AV. The package will handle a maximum of 6ØØ numbers at one time and the largest number of intervals that the histogram may have is 95.

Minimum Hardware: PDP-12A, 8K, 2 TU/55
Other Programs Needed: FOCAL-12
Source Language: FOCAL-12

DECUS NO. 12-38B

Histogram and Two-Factor Analysis of Variance

Mary Kathleen Fairbanks, Neuropsychology Research, Veterans Administration Hospital, Sepulveda, California

As for DECUS NO. 12-38A

DECUS NO. 12-39

QUANAT 1

John Hogan, Weston Observatory, Boston College, Weston, Massachusetts

QUANAT 1 is a version of the Q and A subroutine that has the following features: 1) An independently located ('floating') text buffer, 2) Single character deletion and 3) LAP6 character codes, excluding 75, 76 and 77.

Storage Requirement: 254 Decimal locations
Source Language: LAP6

DECUS NO. 12-40

PDP-8 Disk Monitor - LAP6-DIAL Interface

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This package contains three programs which facilitate operation of the PDP-8 Disk Monitor and LAP6-DIAL operating systems on a PDP-12 at the same time. Rapid bidirectional ASCII and binary file communication between the two operating systems is also provided for.

DECUS NO. 12-40 (Continued)

Minimum Hardware: PDP-12A, DF32 Disk, 8K, TTY, VC 12 Display
Source Language: DIAL

DECUS NO. 12-41

BLOOPD - Blood Pressure Display Program

Julia A. Voland
Submitted by: Dr. Nelson E. Leatherman, Indiana University, Bloomington, Indiana

BLOOPD is primarily for visual information only. It displays either the blood pressure waveform on a calibrated scope, or the digitized values of four parameters of the blood pressure. A printout of the values is also provided. All options are selected by teletype.

Minimum Hardware: PDP-12A
Storage Requirement: Two fields, total 2713_8 locations
Source Language: LAP6

DECUS NO. 12-42

CALCO 12

Richard Reeder, State University of New York, Stony Brook, New York

This plotter program can be used with programs like CATACAL to obtain reasonably high-speed hard copy of data which is stored on tape.

Minimum Hardware: PDP-12, Model 565 CalComp Plotter, VR12 Display, One LINCtape Unit, EAE
Storage Requirement: 1K of core
Source Language: DIAL

DECUS NO. 12-43

PLOT3D

J. Cohen and M. Carhart, Northwestern University Medical School, Chicago, Illinois

This program displays data from LINCtape and allows for user modification before plotting on an XY plotter. As each block is plotted, the previous data is not overwritten. This produces a three-dimensional effect. Data can be single or double precision. The space between each block is selectable. A subroutine to label each graph is included. Frequency power spectra data shows time shifts.

Minimum Hardware: 4K PDP-12, XY Plotter
Storage Requirement: 4K
Source Language: LAP6-DIAL

DECUS NO. 12-44

AVERDT

J. Cohen and M. Carhart, Northwestern University School of Medicine, Chicago, Illinois

This program is designed for averaging EEG analog data points with delayed trigger to indicate each epoch. In this way data both before and after the signal can be studied. The epoch length can vary from 1 to 7 seconds and 7 data channels are available. A number of trials are averaged and can be displayed and saved on LINCtape. One can select a variable stimulus probe. This program is excellent for measuring readiness potentials.

Minimum Hardware: 8K PDP-12, KW12
Source Language: LAP6-DIAL

DECUS NO. 12-45

FOCALP - FOCALPE

Judson Gilbert, Florida State University, Tallahassee, Florida

This is a new version of FOCAL 5/69 (DECUS NO. FOCAL8-52) which has been tailored to the 4K PDP-12A with an incremental plotter. The program exists as symbolic and binary programs on a DIAL V2 tape. In this way it can be readily modified/reassembled/and loaded. There are two versions -- FOCALPE with extended functions, FOCALP without. Many of the commands and features have been changed in this program.

Minimum Hardware: 4K PDP-12A, Incremental Plotter
Source Language: DIAL

DECUS NO. 12-46

STRINGS

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This program provides a character string search function to the DIAL-MS editor. Any character string up to 15 characters in length may be searched for in the work area of the DIAL-MS editor, using STRINGS.

Minimum Hardware: 8K PDP-12B
Other Programs Needed: DIAL-MS
Restrictions: Will not run under DIAL-V2
Source Language: DIAL

DECUS NO. 12-47

PIP-16ØØ

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This program is useful in conjunction with DIAL-MS tapes using DEC's new LINCtape format of $16ØØ_8$ blocks. It provides facilities for storing and retrieving source and binary

DECUS NO. 12-47 (Continued)

files on these tapes (existing software would not store above block 778_8). Also provided is an option to duplicate entire (1600_8 block) LINCtapes. PIP-16ØØ can reference the DIAL-MS work area for either source mode input or output. PIP-16ØØ effectively doubles the storage area on DIAL LINCtapes.

Minimum Hardware:	8K PDP-12B
Other Programs Needed:	DIAL-MS, MARK 12-1 (Included on LINCtape)
Restrictions:	Will not run under DIAL-V2
Source Language:	DIAL

DECUS NO. 12-48

PS/8 FORTRAN Library Routines

Charles M. Moore, III, Rice University, Houston, Texas

This package contains a set of additional PS/8 FORTRAN Library routines. The binary files containing these routines have been collected into library file LIB12.RL on the LINCtape. A modified version of LOADER.SV is provided which searches both LIB.12 and LIB8 when completing the building of a core image of a user's program. File WRITE.UP provides additional details. FORTRAN demonstration programs are included on tape.

Among the routines included on the LINCtape are:

1. PDP-12 PS/8 FORTRAN Display Routines
2. PS/8 FORTRAN Teletype I/O Routines
3. PS/8 FORTRAN File I/O Routines
4. PDP-12 PS/8 FORTRAN LINC mode I/O Routines
5. PDP-12 PS/8 FORTRAN LINCtape I/O Routines

Minimum Hardware:	PDP-12 with PS/8 (Some will run on PDP-8 with PS/8). Display routines require CRT and some require EAE. Two routines require KW12-A real-time clock
Miscellaneous:	Entire package is contained on a PDP-12 LINCtape marked using 128-word blocks
Source Language:	SABR

DECUS NO. 12-49

Cold Start DF32 Disk Formatter for PS/8 on a PDP-12

Mario DeNobili
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

The following problem arises for users who have a PDP-12 (with LINCtape) and a DF32 disk and who wish to use the PS/8 programming system:

They would like to use the disk as the system device since this expands the capabilities of PS/8 and speeds it up considerably; however, they cannot devote the disk to the exclusive use of PS/8 since other programs (notably the LAP6-DIAL-MS monitor system) require the use of the disk. Recreating the PS/8 disk system from scratch is normally very time consuming. This document explains a method for the user to create a PS/8 disk system from scratch as easily as he can bootstrap into a PS/8 LINCtape system.

Minimum Hardware:	8K PDP-12B, 32KDF32 Disk, LINCtape
Other Programs Needed:	PS/8-8K Programming System, PS/8 Configurator
Storage Requirement:	4ØØØ - 426Ø
Source Language:	Assembly Language

DECUS NO. 12-50

EDIT-12

Henry A. Maurer, Digital Equipment Corporation, Maynard, Massachusetts

EDIT-12 is a simple modification of PS/8's EDIT that causes all characters to appear on the scope instead of on the teletype, considerably speeding up editing.

Minimum Hardware:	Any PS/8 configuration on a PDP-12
Source Language:	PAL-8

DECUS NO. 12-51

MAGSPYD

Clark S. Donley, Johns Hopkins University, Baltimore, Maryland

MAGSPYD is a modification of MAGSPY that provides the ability to look at any length tape, and to view the unpacked ASCII generated by the DIAL-MS assembler with a LISTAPE instruction. It allows convenient use of the teletype to restart the program, rewind the tape, go to DIAL, or to display a HELP frame to explain the sense switch options. It includes an A/D knob to control the number of lines displayed on the screen and a sense switch option to stop the movement of the display. It also contains the octal display and large/small waveform options of earlier modifications.

Minimum Hardware:	4K PDP-12
Source Language:	LAP6-DIAL

DECUS NO. 12-52

Student Test Analysis

Stephen J. Mayor, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

This is a three-part program to score and do item analysis of student responses. Part I of the program scores parts of the exam. It prints out the student's number and his score on that part of the exam along with the percentage of the class making the correct answer. Part II takes the scores of all parts of the exam and prints out: (1) the student's number and his overall score, (2) the class mean and standard deviation, (3) the decile distribution in terms of percentage of class, (4) a plot of the decile distribution. Part III of the program computes

DECUS NO. 12-52 (Continued)

the distribution of answers, in terms of percentage of class, to a given question for each part of the exam. Printout is (1) question number, (2) choice number, (3) % of class making that choice, (4) answer key.

Minimum Hardware: 4K PDP-12
Source Language: FOCAL-4K

DECUS NO. 12-53

Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments

Stephen J. Mayor, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

This program takes the raw data outputted from the LSC's (Packard Model 3380) teletype punch, and using the Okitz equations, calculates the DPM for two isotopes of each sample. The AES ratio is used to calculate percentage of efficiency and spillover for each isotope.

Minimum Hardware: PDP-12A, Teletype punch and reader
Storage Requirement: 4096 words
Source Language: FOCAL-4K

DECUS NO. 12-54

QUIP - Quick Assembler for the PDP-12

Stephen G. Wellcome, Digital Equipment Corporation, Maynard, Massachusetts

QUIP is a modification of the DEC Floating Point Assembler to enable it to handle LMODE as well as PMODE instructions. All of the floating point handlers have been removed, and in their place have been substituted handlers for LINC code, ring buffer handlers and nopause routines. Because both the LMODE and PMODE symbol tables are core resident and because of the symbol table search algorithm used, operation is up to four times faster than the DIAL Assembler.

Minimum Hardware: 8K PDP-12
Other Programs Needed: DIAL-MS I/O Routines
Source Language: DIAL

DECUS NO. 12-55

FFAESIM

H. G. Helgeson, Forsvarets Forskningsanstalt, Stockholm, Sweden

This program makes it possible to run the FFTD program on a PDP-12 without the EAE option. It consists of a modified version of Digital-8-17-U, Extended Arithmetic Element Instruction Set Simulator, and a patch to change the EAE instructions in FFTD.

Minimum Hardware: 8K PDP-12B
Other Programs Needed: FFTD (DEC-12-FQEA)
Storage Requirement: 165-177; 200-357; 1600-1653
Source Language: LAP6-DIAL

DECUS NO. 12-56

QANDA+ - Modified QANDA Subroutine

W. R. J. Funnell, McGill University, Montreal, Canada

QANDA+ is a modified version of the QANDA subroutine (DEC-12-FISA). The following changes have been made: (1) it no longer needs to be in the same instruction field as the calling program, (2) both QANDA itself, and the GETKBD subroutine, return control to LAP6-DIAL when Cntrl/D is typed, (3) the routines for returning to LAP6-DIAL, and for typing a carriage return/line feed pair, are both accessible to external programs, and (4) the calling sequence has been changed.

Minimum Hardware: PDP-12B
Storage Requirement: First 4 pages of any segment
Restrictions: Same as for QANDA, also , TTY must be initialized before use
Source Language: LAP6-DIAL

DECUS NO. 12-57

SPY+ - Modified MAGSPY

W. R. J. Funnell, McGill University, Montreal, Canada

SPY+ is a modified version of MAGSPY (DEC-12-USZA). It incorporates the added features of DECUS NO. 12-21 (by Lawrence Moss), as well as the following features: (1) it can handle tapes marked with 1600_8 blocks, (2) upon reaching the end of the tape it will stop moving the window, rather than go to the other end of the tape, (3) it is controlled from the TTY rather than from the sense switches, and (4) the waveform display may be scaled by means of knob 0.

Minimum Hardware: PDP-12A
Storage Requirement: All of segment 1, 6 pages in segment 2, 4 pages in segment 3
Source Language: LAP6-DIAL

DECUS NO. 12-58

FIFOCON

Gerald W. Dulaney, Digital Equipment Corporation, Maynard, Massachusetts

FIFOCON is a File Format Converter program to transfer integer fraction or floating point format data files into any of those formats. Input can be by block number or filename, output is in DIAL file format and can handle double precision integer input or output.

Minimum Hardware: PDP-12/30 (8K, LINCtape, etc.)
Other Programs Needed: FOCAL-12, DIAL-MS
Source Language: FOCAL-12

DECUS NO. 12-59

FOCPLOT

R. Thomas Divers, Case Western Reserve University, Cleveland, Ohio

FOCPLOT is an interactive program to plot FOCAL-12 generated data from integer tape files to a digital plotter. Annotation symbols can be superimposed on the data. Point plot or continuous (straight line between adjacent points) curves may be specified. A short overlay is provided to permit annotated axes and a legend.

Minimum Hardware:	8K PDP-12, LINCtape, Digital Plotter (CalComp or equivalent) VR-12, TTY
Other Programs Needed:	DECUS NO. 8-168, QANDA (both incorporated), LAP-6, DIAL-MS
Storage Requirement:	100-153, 2400-11665
Restrictions:	Maximum of 767 points can be plotted
Source Language:	LAP-6, DIAL-MS

DECUS NO. 12-60

SUMER (French)

J. F. Champarnaud and F. H. Bostem, Liege, Belgium

This French language version of HAMURABI (The Sumer Game, FOCAL8-5) is available on both paper tape and PDP-12 LINCtape. On the LINCtape, both FOCAL, 8K and FOCAL SUMER lists are included.

Minimum Hardware:	8K PDP-8 or PDP-12
Source Language:	8K FOCAL '69

DECUS NO. 12-61

Generating Random Numbers with FOCAL

W. Siegel, K. Whittle and J. Siegel, University of Western Ontario, London, Canada

This program provides a patch to correct the problem with FOCAL's random number generator. This routine was an algorithm developed by Green, Smith and Klem (1959) which has several advantages for use with minicomputers. First, unlike most such generators, it uses an addative rather than a multiplicative process; addition is much faster than multiplication with most machines. Second, the routine is relatively short and third, it has been documented and tested and its characteristics are known. A listing for the patch for FOCAL-12 is provided, but other versions of FOCAL may be modified with similar changes. Three short general programs are included which type out sequences of random integers.

Minimum Hardware:	PDP-8 or PDP-12
Other Programs Needed:	FOCAL, FOCAL-12
Source Language:	Assembly Language

DECUS NO. 12-62

RUFUS

David M. Stern, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado

RUFUS is a display-oriented programmable spectral analysis system. Basic data structures are 512 point vectors which are stored in 6 registers in memory. These registers may be manipulated by a powerful set of commands.

Minimum Hardware:	8K PDP-12/30, 2 LINCtape drives (KW12A real time clock, CALcomp 565 plotter, card reader and LP-8 line printer optional)
Storage Requirement:	8K and overlay storage on LINCtape
Source Language:	PAL

DECUS NO. 12-63 (See also DECUS NO. 12-144)

OLFFT1 and FETCHFFT

R. Cooper, P. V. Pocock, W. J. Warren, Burden Neurological Institute, Stapleton, Bristol, England

OLFFT1 will analyze (continuously or non-continuously) time-series data into power spectra using the Fast Fourier Transform and store the spectra on LINCtape.

FETCHFFT will retrieve spectra stored by OLFFT1 for further inspection including, displaying and plotting.

Minimum Hardware:	PDP-12/30, 8k memory; KW12A Real Time Clock; A/D converters
Source Language:	DIAL

DECUS NO. 12-64

Walsh Transform Subroutines, PWALSH and LWALSH

Major Tom G. Purnhagen, Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio

PWALSH and LWALSH are PDP-12 subroutines, written in PDP-8 mode and LINCmode respectively, which compute the "natural" Walsh transform of an $N=2^K$-element array of data. As listed, the programs operate on an array of 256 points (k-8). Modification for different values of K is described in the program write-up

Minimum Hardware:	PWALSH: Any PDP-8 or PDP-12; LWALSH: Any PDP-12
Storage Requirement:	50-54 Locations, plus data and work area
Source Language:	LAP-6/DIAL (PWALSH is compatible with PAL III

DECUS NO. 12-65

PISH - Poststimulus Time and Interspike - Interval Histogram

Dr. D. J. Woodward, University of Rochester
Submitted by: Ron Carter, Digital Equipment Corporation, Maynard, Massachusetts

PISH consists of two programs, ISH (interspike interval histogram) and PSTH (poststimulus time histogram). ISH and PSTH compute density histograms of the frequency of time intervals between events or of frequency of events after synchronizing or stimulating pulses. The programs are capable of analyzing times of occurrence of single events and of groups of events defined as bursts.

Minimum Hardware:	8K PDP-12, KW12A, LINCtapes
Source Language:	DIAL

DECUS NO. 12-66

ADDINDX (LAP6-DIAL-MS Index Manipulator)

Roger C. Tindle, U. S. Dept. of Interior, Fish-Pesticide Research Laboratory, Columbia, Missouri

ADDINDX allows the user to enter, delete or search for programs in the DIAL index. The major value of the program is that new entries may be specified in the tape area above Blk 777. The program is essentially a handler for the subroutine set MILDRED. QANDA is used for the display frames.

Minimum Hardware:	8K PDP-12/20; supports multiple tape units and RK8 or RSØ8 disk
Other Programs Needed:	QANDA (DEC-12-FISA), MILDRED (DEC-12-FZDA), uses DIAL-MS I/O routines
Restrictions:	A DIAL-MS System tape must be mounted on unit Ø
Source Language:	LAP6-DIAL-MS

DECUS NO. 12-67

PPG FOCAL

Edward Steinfeld
Submitted by: Karen Seefeldt, Digital Equipment Corporation, Pittsburgh, Pennsylvania

PPGFOCAL is a modification of DECUS NO. 12-24. It combines the overlays $DEVICE, $CHARS12 and $DTOA. The functions FATN, FCOS, FSIN, FEXP and FLOG have been removed. The system does not check for a negative sign when doing a square root. PPGFOCAL has room for approximately 200 variables.

Minimum Hardware:	12K PDP-12
Source Language:	LAP6-DIAL

DECUS NO. 12-68

A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor

L. G. Boxall and R. H. Abel, Colorado State University, Fort Collins, Colorado

This FPP-12 simulator can be used to directly replace the floating point software package in any PDP-12 assembler program. Enhanced computational speed (5 to 10 times) and smaller core requirements are realized by the use of the FPP simulator. The simulator will accept all of the instructions used in the PDP-8 floating point systems packages, as well as providing many additional programming features.

Minimum Hardware:	PDP-12, FPP-12 Processor
Storage Requirement:	0.7K plus optional routines
Restrictions:	Must be located in field Ø
Source Language:	Assembler-PDP and FPP-12

DECUS NO. 12-69

An On-Line FOCAL-12 Program for Auto-Analyzers

Mack W. Overton, Jr., Larry L. Alber and Dr. Donald E. Smith, U. S. Food and Drug Administration, Chicago, Illinois

This is a program for auto-analyzer data acquisition and reduction on a mini-computer, using an easily constructed interface. Circuit diagrams for the interface are included with the program write-up.

Minimum Hardware:	PDP-12/30 or PDP-12/20 with KW12A clock and 8K core
Source Language:	FOCAL-12

DECUS NO. 12-70

COMPLT

Harry Bryant, Krusen Research Center, Temple University, Philadelphia, Pennsylvania

COMPLT is a SABRised version of the DECUS NO. 8-168 plotting package. It retains all features of that program, with the additional advantage of allowing it to be called as a FORTRAN subroutine.

A DECtape version is available for PDP-8 users.

Minimum Hardware:	PDP-12A
Source Language:	PS-8 SABR

DECUS NO. 12-71

Snoopy Display Program

Mark F. Lewis, Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

This is a paper tape version of the original DECUS NO. L-87. It is now offered in binary paper tape format for both the LINC-8 and the PDP-12. (See DECUS NO. L-87a.) The PDP-12 version has been revised to eliminate the need to use L8SYM when running on the PDP-12

DECUS NO. 12-71 (Continued)

The program displays Snoopy and his Sopwith Camel on the oscilloscope.

Storage Requirement: LIF2: 20-1746; LIF3: 20-647
Source Language: LAP6-DIAL

DECUS NO. 12-72

Four-Point Smoothing With FPP-12

L. L. Alber, M. W. Overton and Dr. D. E. Smith,
U. S. Food and Drug Administration, Chicago, Illinois

This program was developed to smooth an array of up to 4095_{10} data points stored as 1-12 bit words using the FPP-12. Using a 4-point least squares quadratic, the data is floated, fitted, smoothed, fixed and restored in its original location, while displaying on the CRT.

Minimum Hardware: 8K PDP-12 and FPP-12
Other Programs Needed: LAP6-DIAL with FPPASM (on tape)
Source Language: LAP6

DECUS NO. 12-73

8-Point Quadratic Smooth With FPP-12

L. L. Alber, M. W. Overton and Dr. D. E. Smith,
U. S. Food and Drug Administration, Chicago, Illinois

This program has been developed to smooth an array of up to 4095_{10} data points stored as 1-12 bit words using the FPP-12. Using a 8-point least squares quadratic, the data is floated, fitted, smoothed, fixed and restored in its original location, while displaying on the CRT.

Minimum Hardware: 8K PDP-12 and FPP-12
Other Programs Needed: LAP6-DIAL
Source Language: LAP6 with FPPASM

DECUS NO. 12-74

*REGRES - Multiple Linear Regression

David C. Howell, University of Vermont, Burlington, Vermont

This is a multiple linear regression program which handles up to 10 predictor variables. The printout includes the means and standard deviations for each variable, the intercorrelation matrix, the inverse, and the standard and raw score regression weights, as well as the multiple correlation coefficients. No programming knowledge is required of the user once the system is stored on LINCtape and FOCAL-12 has been loaded.

Although no tapes are offered, anyone using this program will have no difficulty entering it from the teletype.

Minimum Hardware: PDP-12 A or B
Source Language: FOCAL-12 running under the DIAL monitor

DECUS NO. 12-75

FORTRAN Subroutines for the PDP-12

Thomas V. McCaffrey, Loyola University Medical Center, Maywood, Illinois

This package consists of eight subroutines and functions written for real time control of the PDP-12's clock display, A to D's sense switches, external line levels, relays and left switches.

The ASCII tape offered with the package is a sample FORTRAN program for a time interval histogram which demonstrates the subroutines.

Minimum Hardware: 8K PDP-12
Other Programs Needed: 8K FORTRAN System or PS/8 System
Source Language: FORTRAN, SABR

DECUS NO. 12-76

TAPELOOK; CORELOOK; SEARCH

David C. Freeman, Harvard Medical School, Boston, Massachusetts

TAPELOOK, a DIAL tape examiner, requests tape unit Ø or 1, a tape block (Ø-777), and displays it as a plot, text, or LINC code. Tape block may be advanced or backed up from the teletype, or a new block requested. The index may be displayed in DIAL format with correct line numbers.

CORELOOK is usually loaded into an unused instruction field. It can then examine 8K of core, displaying as octal, text, or LINC code. A map of any field may be displayed showing all non-zero locations, and a cursor to display any ten locations.

Given a search word, SEARCH will examine the DIAL source working area, and display every line which contains the search word, with correct line numbers.

Minimum Hardware: 8K PDP-12 with display and analog channels
Source Language: LINC Code

DECUS NO. 12-77

PAL12A Assembler

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

PAL12A provides users of smaller PDP-12's with capabilities formerly available only to those with 8K or more. These capabilities include 8-mode literals and off-page links, "LISTAPES," core usage maps and chained assemblies.

Minimum Hardware:	4K PDP-12, 2 LINCtapes, Scope, TTY
Other Programs Needed:	4K LAP6-DIAL-V2
Storage Requirement:	All of 4K
Restrictions:	Will run on 4K only. For others see write-up
Source Language:	PAL12A

DECUS NO. 12-78

PUBPLOT

William L. Rankin, Veteran's Administration Hospital (116), San Francisco, California

PUBPLOT was written to produce graphic plots suitable for many publication purposes. All input is through the teletype. When fully utilized PUBPLOT produces a graph with X and Y axes, numerical and character headings for both axes, seven lines of any shape, and a scattergram. Any of these segments of the graph may be deleted according to program specifications.

Minimum Hardware:	4K PDP-12, TTY, COMPLOT DP-1-1 or equivalent
Restrictions:	Maximum of 1024_{10} input characters and values
Source Language:	8-Mode and LINC Assembly Languages

DECUS NO. 12-79

Modified ADTAPE

William E. Hatcher, III, Veteran's Administration Center, Temple, Texas

This patch to ADTAPE will permit ADTAPE to store data on a LINCtape of 896 (1600_8) standard blocks. Data files may begin in any block and may be continuous over blocks 511 and 512 (777_8 and 1000_8). The experiment parameters can be stored in any of the 896 blocks.

Minimum Hardware:	PDP-12/20
Other Programs Needed:	ADTAPE (DEC-12-SE2E)
Storage Requirement:	Same as ADTAPE plus locs 7600-7606, 7500-7507, 7700-7706
Source Language:	LAP6

DECUS NO. 12-80

FOCAL-RT

William Siegel and Keith Whittle, University of Western Ontario, London, Canada
Submitted by: Kenneth Ellson, Digital Equipment Corporation, Maynard, Massachusetts

Modifications of FOCAL-12 that include device-independent chaining of FOCAL and assembly-language programs, computed GOTO and DO commands, new FRAN( ) function, FIN ( ) and FOUT ( ) to handle character strings in FOCAL files, subroutines for opening and closing FOCAL files within assembly-language programs, LPØ8 printer option, return-to-DIAL command, and expanded text buffer.

Minimum Hardware:	8K PDP-12, LINCtapes or Disk
Other Programs Needed:	DIAL-MS Monitor
Source Language:	FOCAL, DIAL

DECUS NO. 12-81

VR12 SCOPE HANDLER FOR OS/8

Mario DeNobili et al
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

This is a two-page handler for the PDP-12 VR12 scope. Display freezes when scope fills up. You go to next scope page by typing any character. Very useful with PIP.

Minimum Hardware:	PDP-12, PS/8 configuration
Other Programs Needed:	PS/8 system
Storage Requirement:	2 pages
Source Language:	PAL-8

DECUS NO. 12-82

LAP6-DIAL TO PS/8 SOURCE FILE CONVERTER

Mario DeNobili
Submitted by: Stanley Rabinowitz, Digital Equipment Corporation, Maynard, Massachusetts

This program allows you to convert source files stored on LAP6-DIAL LINCtapes (4ØØ words per block) to any PS/8 file. It runs under PS/8.

Minimum Hardware:	PDP-12, PS/8 configuration
Other Programs Needed:	PS/8 system
Source Language:	PAL-8

DECUS NO. 12-83

$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN

A. S. Craig, Research Dept., Lakeshore Psychiatric Hospital, Toronto, Ontario

This program produces the standard ANOVA Table for a Repeated-Measures Design.

DECUS NO. 12-83 (Continued)

Minimum Hardware:	PDP-12 with 8K core
Other Programs Needed:	FOCAL 12 with extender patch as per FOCAL 12 Manual Appendix E
Restrictions:	Number of subjects and treatments ≤ 57; Number of subjects and treatments ≤ 850
Miscellaneous:	Reference: B. J. Winer, Statistical Principles in Exp't Design 2nd edition, chapter 4, 1971
Source Language:	FOCAL

DECUS NO. 12-84

AVERAGER

Richard W. Reeder, State University of New York, Stony Brook, New York

Used to simultaneously average 5 channels of analog data such as EEG, ECG, etc. and store the average on LINCtape.

Minimum Hardware:	8K, EAE, KW12A, TU55 (2) A/D
Storage Requirement:	0-2000, 4000-7777; field 1 0000-7777
Source Language:	DIAL

DECUS NO. 12-85

APOLLO 12

Andres J. Magre, COASIN S. A., Buenos Aires, Argentina

Simulates the Apollo descending on the moon surface. The operator governs the fuel rate. The program takes the fuel rate and makes all calculations every one second, thus operating in true real time. Indicators and time-altitude diagram are displayed.

Two versions are supplied, the second of which uses the sense switch to guard against over-enthusiastic players.

Minimum Hardware:	PDP-12A 8K
Other Programs Needed:	Version 1: FOCAL-12 interpreter Version 2: FOCAL-12 and DECUS NO. 12-24
Miscellaneous:	This is a modification of "Moon Landing" demo program published in DEC-08-XJFB-D FOCAL Demonstration Programs
Source Language:	FOCAL-12

DECUS NO. 12-86

ORGAN-AA and ORGAN+BA

Andres J. Magre, COASIN S. A., Buenos Aires, Argentina

Program to allow use of the PDP-12 to simulate organ music. Two versions are supplied. One allows the user to play directly from the keyboard. The second is similar, but the notes are first stored in core and retrieved consecutively each time any key is struck.

Minimum Hardware:	PDP-12, 4K core
Storage Requirement:	Approximately one 8-mode page Variable from there
Source Language:	PAL III

DECUS NO. 12-87

ONDISK-OFFDISK

R. D. McCook and T. V. McCaffrey, Department of Physiology, Loyola University, Maywood, Illinois

The two programs, OFFDISK and ONDISK, provide the capability of easily dumping the contents of a DF/DS-32 disk onto LINCtape and restoring the disk with the tape image at a later time. The disk image files are indexed and filed under the DIAL monitor and up to five disk images can be stored on a 1600 block LINCtape.

Minimum Hardware:	8K PDP-12, TU-55 tape transport DF-32 disk
Other Programs Needed:	DIAL-V2 (supplied)
Storage Requirement:	8K can be modified for 4K
Restrictions:	Restricted to DF/DS-32 disk
Source Language:	DIAL

DECUS NO. 12-88

OCTALFPP

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

An octal translation of a single length floating point package for use on a PDP-12 computer. Inputs, outputs, does various floating point operations on floating point numbers.

Minimum Hardware:	PDP-12A
Storage Requirement:	Locations 40-61, 5600-7577
Source Language:	DIAL-V2

DECUS NO. 12-89

BUTFLTR

Arnold Gershon
Submitted by: Proffesor Se Jeung Oh, City College, New York

An engineer-interactive design program for the PDP-12. Will display frequency response of low pass Butterworth filter of order $1 \leq n \leq 64$ and calculate parts valves for same for any cutoff frequency and any matched input/output impedance.

Minimum Hardware:	PDP-12A
Other Programs Needed:	OCTALFPP (DECUS NO. 12-88)
Storage Requirement:	With OCTALFPP approximately 2600 words
Source Language:	DIAL-V2

DECUS NO. 12-90

REPRSNT

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Formulates octal representation of floating point numbers required as constants. Program inputs a number from teletype then outputs the correct octal representation of the number.

Minimum Hardware:	PDP-12A
Other Programs Needed:	OCTALFPP - DECUS NO. 12-88
Storage Requirement:	74_8 words plus approximately 2000 words for OCTALFPP
Source Language:	DIAL-V2

DECUS NO. 12-91

OCTPUNCH

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Program will punch a source paper tape containing the octal equivalent of a specified section of core. This tape can then be assembled at a later time faster than its original source could be and without any conflicting symbols which the original might have contained.

Minimum Hardware:	PDP-12A
Storage Requirement:	143_8 words
Source Language:	DIAL-V2

DECUS NO. 12-92

PDP8TO12

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Short utility routine for making a source tape produced by a PDP-8 acceptable to a PDP-12.

Minimum Hardware:	PDP-12A
Storage Requirement:	18 words
Source Language:	DIAL-V2

DECUS NO. 12-93

TRANS

Arnold Gershon
Submitted by: Professor Se Jeung Oh, City College, New York

Will translate a BIN paper tape to an octal source paper tape. The octal source can then be assembled together with other routines. In addition, the translation will satisfy any curiosity about what a particular BIN tape contains.

Minimum Hardware:	PDP-12A
Storage Requirement:	73_8 words
Source Language:	DIAL-V2

DECUS NO. 12-94

DATAN

Pietro Morasso
Submitted by: Jean Graham, M.I.T., Cambridge, Massachusetts

DATAN is used to analyze psychophysical and neurophysiological data, collected on DECtapes. Analysis is done with a number of computing modules, which execute simple operations like smoothing, scaling, linearizing, computing calibrations, measurements and derivatives, etc. Linking different modules may be manual or automatic.

Minimum Hardware:	PDP-12B (8K) + 2 LINCtape units + 1 RSØ8 or RK8 disk
Other Programs Needed:	FOCAL-12
Storage Requirement:	8K
Source Language:	FOCAL-12

DECUS NO. 12-95

PDP-12 PS/8 Utility Programs

Charles M. Moore, III, 1700 Sunset Blvd., Houston, Texas

This package contains the following utility programs, along with their sources.

1) MAGSPY displays the contents of any block on any PS/8 device, using any of several modes selected by the sense switches. Included is a mode which displays PS/8 source files as text listings.

2) INDEX displays PS/8 device indices, deletes files with rubouts, transfers groups of one or more files from one device to another.

3) COPY duplicates entire PS/8 LINCtapes.

4) MARK12 marks LINCtapes.

5) DIALPS copies files from DIAL LINCtape 1 to PS/8 device SYS, automatically converting core-image file headers.

6) PSDIAL copies files from PS/8 to DIAL.

MAGSPY, INDEX and COPY use SABR routine IHELP to display operating instructions. Other SABR or FORTRAN programs can also use IHELP.

Minimum Hardware:	8K PDP-12 with scope
Other Programs Needed:	PS/8 System
Source Language:	SABR

DECUS NO. 12-96A&B

SCOPE and CNGMWA

Carol Horwitz, Philip Reid, Richard LeFaivre (A); Carol Horwitz (B)
Submitted by: Michael E. Clark, Laboratory Computer Facility, University of Wisconsin Medical Center, Madison, Wisconsin

A. SCOPE is a CRT-based editor for the PS/8 (or OS/8) system on a PDP-12. A user-selected portion of the source text is in full view on the CRT during editing. Features include character editing via a key-controlled cursor, full forward and backward movement through the source, the ability to search for specified text strings, and horizontal tabbing. The command set for SCOPE is small and easily learned. SCOPE is based upon the LAP6W (and hence LAP6) manuscript editors.

B. CNGMWA is a support program for SCOPE, the scope-oriented PS/8 editor. CNGMWA may be used to change the size of SCOPE's internal scratch file, allowing larger source programs to be edited.

Minimum Hardware:	8K PDP-12, VR14 CRT or similar CRT
Other Programs Needed:	PS/8 or OS/8
Source Language:	PAL-8 and LAP6W

DECUS NO. 12-97

An Off-Line FOCAL-12 Program for Auto-Analyzer by TWX

L. L. Alber and Mack W. Overton, U. S. Food and Drug Administration, Chicago, Illinois

Data being input by teletype or paper tape reader is displayed on the CRT. Instrument readings are transmitted long-distance to the computer by TWX. Program calculates values for each cup reading, a standard deviation and coefficient of variance report.

Minimum Hardware:	8K PDP-12
Other Programs Needed:	FOCAL-12
Source Language:	FOCAL-12

DECUS NO. 12-98

HERALD - Analog-Digital Average and Standard Error Program

David Johnson, University of Ulm, West Germany

Averages 8 channels of analog data and calculates ± 2 standard error limits. Curves of sequential S.E. also are provided and automatic correction of drift (Zero-Line), calibration data storage on tape, curve display and plotting and data typeout. Allows intra-individual statistical comparison i.e. Evoked Potentials.

Minimum Hardware:	8K PDP-12 with A-D, VR-12 Display, basic LINCtape system, ASR33, KW12, KE12
Restrictions:	+0.5 volts continuous input
Source Language:	LAP6

DECUS NO. 12-99

A Set of Spectral Programs

Cyril H. Nute, Naval Medical Neuropsychiatric Research Unit, San Diego, California

XSPECT is a pair of programs written for the PDP-12 computer. Program XS , written in DIAL , accepts 2048 digital data measurements for each of two EEG channels, written on one reel of LINCtape mounted on Unit 0. This input record may be created from analog voltages input to the AD12 analog-to-digital converter, using the two D.E.C. programs, ADTAPE and ADCON . The output of programs XS is a three-block record written on the "intermediate output tape," mounted on Unit 1.

The second program of the set is $XS, written in FOCAL-12, under the DIAL-MS monitor system. It accepts a three-block intermediate record from the LINCtape mounted on Unit 1, and uses the ASR33 teletype to create a listing of two auto-power density spectra, plus the coherence and phase relationships between the two EEG data channels. Frequencies are written on the left edge of the paper, with each line of output representing a .5-Hz frequency interval.

Minimum Hardware:	8K PDP-12, AD12 analog-to-digital converter, KW12 clock, 2 LINCtape units, ASR33
Other Programs Needed:	DIAL-MS Monitor System, with FOCAL-12; QANDA; FFT (DECUS NO. 8-143)
Restrictions:	Need two channels of input data on LINCtape, sampled at 128 Hz for 16 sec; output resolution in .5 Hz. May be changed by contacting the author
Source Language:	DIAL

DECUS NO. 12-100

MEMO III - A Text Formatting Program

Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

MEMO III is a program written for the OS/8 system to produce paged text with margins from free form text. The intention is to permit the user to produce a readable and neatly formatted copy of text with minimal effort.

MEMO III is a descendant of Gregory Ruth's original program. This version permits output on any OS/8 compatible output device, rather than restricting output to the teletype. Files written for MEMO and MEMO II are compatible with MEMO III.

Minimum Hardware:	PDP-8/12, ASR33 (or equivalent) and either DECtape or disk
Other Programs Needed:	OS/8 Programming System
Miscellaneous:	Same program is available on DECtape as DECUS NO. 8-427b
Source Language:	PAL-8

UNDRAWN

DECUS NO. 12-101

OS/8 SKED

Mark F. Lewis and Patricia Savage

Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

OS/8 SKED is a modification to DECUS NO. 8-465 that permits the user to take advantage of the device-independence of OS/8 for compiling and running SKED programs.

Minimum Hardware:	12K for compiler, 8K for run-time system, OS/8 configuration, 100 cycle real time clock, interface
Other Programs Needed:	OS/8 (DECUS NO. 8-465)
Source Language:	PAL-8

DECUS NO. 12-102

A Manual for the PDP-12 Operator

Peter Hiscocks, Ryerson Polytechnical Institute, Toronto, Ontario, Canada

Most manuals are for the computer; this one is for the operator. Its purpose is to clarify operating procedures for the PDP-12 console, paper tape loaders, DIAL Operating System, Peripheral Interchange Program (PIP) and the special PDP-12 peripherals. It was written primarily for students.

DECUS NO. 12-103

$HAPPY

Roger C. Tindle, Columbia, Missouri

This program generates a happy-face display on the VR12 scope.

Minimum Hardware:	PDP-12, VR12 scope
Source Language:	FOCAL-12

DECUS NO. 12-104

CORDATFP

Ray Cooper, Burden Neurological Institute, Stapleton, Bristol, United Kingdom

CORDAT computes cross-correlation of two blocks of data stored on Unit 1 with ± 64 (lag and lead) points. Displays on oscilloscope and plots on incremental plotter.

Minimum Hardware:	8K PDP-12, Plotter (optional)
Other Programs Needed:	FPP 12
Source Language:	DIAL MS/LAP6

DECUS NO. 12-105

DATAFILE and DFUPDATE

C. M. Malpus, Ph.D., University of Leeds, Department of Physiology, Leeds, United Kingdom

DATAFILE is a LINCtape-based display-interactive library designed primarily as a transparent system by which data from user programs can easily be stored, edited and retrieved. The only addition needed to any user program to add filing capabilities is a short loader routine, and only one memory location is modified when the program is restarted.

Binary programs can also be stored and DATAFILE can be used as a free-standing library system, started from the console and capable of loading and starting the binary programs filed within it.

DATAFILE thus takes over the binary library and loading facilities of DIAL, and can additionally be called from (and exit to) user programs to file resultant data. Because of its compactness and its increased file and index space it is much more efficient, as well as easier to use, than DIAL for debugged, operational programs.

DFUPDATE is the means by which new binary programs are added to a DATAFILE program library. Programs are transferred from the DIAL binary working area on a LINCtape to a DATAFILE file on the same or another LINCtape, and the index updated accordingly. Once filed by DFUPDATE, such programs can be loaded and started by DATAFILE.

Minimum Hardware:	VR 12/14, TC12, TU55 or TU56, TTY, AD 12
Restrictions:	DECtape Handlers only. No disk I/O
Source Language:	DIAL

DECUS NO. 12-106

$PLOT

Frank Sandy, Raytheon Research Division, Waltham, Massachusetts

This is a FOCAL-12 overlay that allows an incremental digital plotter to be operated from a FOCAL program on a PDP-12. It can be used to draw lines or points with FOCAL's extra function FX, or to draw characters with FOCAL's extra function FZ.

Editor's Note: There is another $PLOT routine included in OVERLAYS TO FOCAL-12 (DECUS NO. 12-24)

Minimum Hardware:	8K PDP-12, LINCtape or disk, Digital Incremental Plotter
Other Programs Needed:	FOCAL-12 and $CHAR (included on tape for $PLOT)
Storage Requirement:	Overlay locations 4247-4612
Restrictions:	Limited by plotter for lines, slightly slower for characters
Source Language:	LAP6

DECUS NO. 12-107

AVUPTO8, AVUPTO8S

A. M. Halliday, Medical Research Council, National Hospital, London, United Kingdom

A flexible multichannel averaging program for evoked responses, allowing choice of number of sweeps, channels and sampling rate via the teletype. Averaged data can be stored or retrieved from tape (1600 blocks with AVUPTO8S) and plotted out. Display monitors running sum or current input. The averaging sweep is triggered by an external pulse on the chosen sync input.

Minimum Hardware:	8K PDP-12A, KW12, Houston Complot DP1, XY plotter
Other Programs Needed:	LAP6-DIAL
Restrictions:	Up to 8 channels. Maximum sampling rate: 10 Kcs/number of channels chosen
Source Language:	LAP6-DIAL

DECUS NO. 12-108

FPPNEW - Replacing the DIAL-MS-Assembler by an Improved Version of the FPP Assembler

Juergen Stegemann, M.D., Deutsche Sporthochschule Cologne, Cologne, West Germany

For a PDP-12 user it is a serious disadvantage that the FPP Assembler (DEC-12-AQZA-D) is not able to produce LINC codes and that it does not work with one DF32 in connection with LINCtapes. Therefore an improved program is offered to get nearly full compatibility to the DIAL-MS assembler as well as to the FPP system. Since the DIAL-MS assembler has no advantage any more, it was replaced by the new program. Some additional features are added, which are not included in both assembly programs now.

Minimum Hardware:	8K PDP-12A, 1MC12, 1FPP12, 1DF32
Other Programs Needed:	DIAL-MS
Source Language:	Assembler

DECUS NO. 12-109 A,B,C

QNANSWER, QANDATTY, SUPRSHUF

Ronald W. Wood, University of Rochester School of Medicine, Rochester, New York

A. QNANSWER retrieves information from the QANDA (DEC-12-FISA-D) answer buffer, ignoring terminal null values. The program accepts 8's and 9's as octal 10's and 11's. Each question field within a display is limited to a maximum of four characters. The program occupies 38_{10} locations, B16 and B17.

B. QANDATTY prints QANDA (DEC-12-FISA-D) displays and user responses on the teletype. The program occupies 102_{10} memory locations and utilizes Beta registers 2 through 6. It provides the user the option of printing several display lines to the teletype line.

C. SUPRSHUF shuffles data with a pseudo-random algorithm which repeats every 512 non-zero input data points.

Tape contains source files for QNANSWER and QANDATTY, cont binary and source files for SUPRSHUF.

Minimum Hardware:	4K PDP-12, TTY, scope, 2 tape units
Other Programs Needed:	QANDA (DEC-12-FISA-D)
Source Language:	DIAL-MS

DECUS NO. 12-110

DIAL-MS for 1600 Blocks

David Goodman, Psychophysiology Laboratory, V.A. Hospital, Bedford, Massachusetts

DIAL-MS, version SE2E, cannot directly access LINCtape blocks greater than 777 in any of its operations. DIAL-MS for 1600 Blocks, by means of patches to most of the routines and reassemblies of the ADD PROGRAM routine and PIP, has been modified to access all 1600 blocks in all of its routines.

Minimum Hardware:	8K PDP-12, 2 LINCtapes marked with 1600 (octal) standard blocks
Restrictions:	Has not been tested on a disk system
Source Language:	DIAL-MS

DECUS NO. 12-111a

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Pennsylvania

ADFILE, a modification of ADTAPE to run under PS/8 on a PDP-12A, is a data acquisition program that permits from one to sixteen AD12 A/D channels to be sampled consecutively.

Minimum Hardware:	8K PDP-12A with KW12A, AD12, (RF08 disk optional)
Other Programs Needed:	PS/8 Operating System
Restrictions:	Must be run on a PDP-12A with LINCtapes or RF08 disk as output device; PS/8 or OS/8 must be built with CONFIG - not BUILD
Source Langauge:	PAL-8

DECUS NO. 12-112

IDXRDD

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Pennsylvania

IDXRDD is a collection of FORTRAN callable subroutines for reading PS/8 unformatted data files, such as the output for ADFILE (DECUS NO. 8-211a). The subroutines contained in the package are: INDEX, RDHAN and NAMUD.

DECUS NO. 12-112 (Continued)

INDEX will perform a directory search on a device file specified at the keyboard by the user in a standard PS/8 command line.

RDHAN allows reference for reading last device handler specified in a call to INDEX.

NAMUD allows file name specified in INDEX to be incremented by octal one forming a new file name. Then the device directory is searched for the new file name.

Minimum Hardware:	PDP-12A, TTY, Tapes, Disk
Other Programs Needed:	PS/8 monitor
Restrictions:	All subroutines must occupy same LINC segment
Source Language:	SABR

DECUS NO. 12-113

IDXWT

Harry Bryant, Moss Rehabilitation Hospital, Krusen Research Center, Philadelphia, Rennsylvania

IDXWT is a group of FORTRAN callable subroutines needed for writing unformatted data files on a PS/8 device. The subroutines are FOPEN, FCLOSE, WITHAN and NAMUP.

FOPEN performs a file search and opens a tentative file on a PS/8 device. WITHAN allows the user to write unformatted files on the PS/8 device loaded when FOPEN was called. FCLOSE closes the tentative file opened in FOPEN. NAMUP allows the file names specified in FOPEN to be incremented by octal one forming a new file name. A tentative file is then opened using the new file name.

Minimum Hardware:	PDP-12A, TTY, LINC, Tape, Disk
Other Programs Needed:	PS/8 monitor
Source Language:	SABR

DECUS NO. 12-114

FOCAL-PL

T. V. McCaffery and R. D. McCook, Dept. of Physiology, Loyola University, Maywood, Illinois

This is a modification of FOCAL-12 which allows data plotted on the screen to be transferred to a digital plotter. This program works with a Houston DP-1 plotter, but others could probably be used. It does not occupy any user space but uses the scope text buffer, thereby making the scope text feature inoperative.

Minimum Hardware:	8K PDP-12, Digital plotter, EAE optional
Restrictions:	Destroys text storage on scope
Source Language:	DIAL

DECUS NO. 12-115

PLOT3D, Pseudo 3-Dimensional Perspective Display for the PDP-12

Michael F. Lubozynski and John A. Freeman, Vanderbilt University School of Medicine, Nashville, Tennessee

PLOT3D is a LINC-mode program which will produce a pseudo 3-dimensional display of up to 16 256-word waveforms, shown at any desired perspective (and scale) and interconnected by a user-specified number of contour lines.

Minimum Hardware:	8K PDP-12
Restrictions:	All input must be in octal
Source Language:	DIAL-MS

DECUS NO. 12-116

FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals

L. L. Alber, M. W. Overton and Dr. D. E. Smith, U. S. Food and Drug Administration, Chicago, Illinois

An 8-point least-squares fitting algorithm for the FPP-12 is used as a subroutine of FOCAL-12 to reduce Auto Analyzer data previously stored on LINCtape by ADTAPE/ADCON operating on-line with up to 16 instruments.

Minimum Hardware:	8K PDP-12, 2 LINCtape units, 1 DF32 disk, FPP-12
Other Programs Needed:	FPPASM Assembler
Source Language:	LAP6-DIAL and FPPASM

DECUS NO. 12-117

TAPEDIT; A PDP-12 LINCTAPE EDITOR

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

TAPEDIT provides a quick and efficient means of inspection and modification of data contained on LINCtape. It is an improvement over previous 4K tape editors in that its principal output device is the VC12 scope. Output may also be directed to the console teletype. Data may be interpreted as octal values, DIAL sixbit characters, or PDP-10 sixbit characters. Word search and data move functions are also provided. TAPEDIT will operate properly with tapes up to 4096 blocks long and with blocks containing up to 512 data words.

Minimum Hardware:	PDP-12A or 12/20 (Scope, LINCtape and A/D channels)
Source Language:	LAP6-DIAL V2

DECUS NO. 12-118

Average Transient Advanced Programs

C. M. Malpus, Ph.D., Department of Physiology, University of Leeds, Leeds, United Kingdom

These programs each offer advances over previous DEC or DECUS average transients construction programs. Both are easy to use with flexible very fast (30 usec point minimum) data collection routines. AVTRCOMP allows non-simultaneous collection of up to four transients, with commands for subsequent arithmetic combination, cross-comparison, differentiation and integration. AVDEVVAR collects one transient only, but calculates the variance of each point; thus confidence limits or a variation envelope can be placed on an average transient, allowing significance of difference assessments to be made.

These programs may be located and run from standard DIAL file, but are optimally used in conjunction with the DATAFILE library facility, in order to store collected data on LINCtape.

The LINCtape supplied contains binaries and sources of both programs, filed under DIAL; in addition a DATAFILE library system containing the two binaries occupies the low end of the tape. This area is reserved in the DIAL index.

Minimum Hardware: PDP-12, KW12, VR12, AD12, TTY
Storage Requirement: 4K for AVTRCOMP, 8K for AVDEVVAR
Source Language: DIAL

DECUS NO. 12-119

Neurone Spike Train Analysis Programs

C. M. Malpus, Ph. D., Department of Physiology, University of Leeds, Leeds, United Kingdom

Three of the basic presentation methods for single neuron spike train data are carried out by these programs. A flexible data collection routine allows simultaneous collection of two independent spike trains. FREQHIST constructs instantaneous frequency histograms, PSTMHIST constructs post-stimulus histograms and INTVHIST interval histograms. All displays are fully calibrated and can be scaled and expanded by the operator. FREQHIST and PSTMHIST can simultaneously collect one channel of analog information for later monitoring or cross-correlation.

These programs may be loaded and run from standard DIAL files, but are optimally used in conjunction with the DATAFILE library facility, in order to store collected data on LINCtape.

The LINCtape supplied contains binaries and sources of all three programs filed under DIAL. In addition a DATAFILE library system containing the three binaries occupies the low end of the tape. This area is reserved in the DIAL index.

Minimum Hardware: 4K PDP-12, KW12, VR12, AD12, TTY
Source Language: DIAL

DECUS NO. 12-120a

DUAL Assembler

John R. Raines, Northwestern University Medical School, Chicago, Illinois

DUAL is derived from QUIP, DECUS NO. 12-54. It has been given extra pseudo-ops, etc. to make it nearly DIAL compatible. In addition, it offers literals; address multiplication, division and rotation; several fold increase in assembly speed; a second set of conditional assembly pseudo-ops and some additional pseudo-ops. Updated August 1973.

Minimum Hardware: PDP-12 with DIAL-MS and EAE, TTY, preferably ASR35
Source Language: DUAL

DECUS NO. 12-121

Arrhythmia Detection and Categorization

Roy James Stanfill, Bioengineering Division, University of Washington, Seattle, Washington

This is a real-time QRS detection and analysis routine based upon R-wave slope detection. The ECG, filtered from 3 Hz to 40 Hz, is input to the A/D Converter. Each QRS is compared with a stored average and judged normal or abnormal; the R-R interval is also checked to determine whether the beat is early or late. Several displays are available. Every 10 minutes, or upon request, the number of beats and arrhymias for the preceding 10 minutes, are typed out. If a Tektronix video terminal and hardcopy unit are available, copies of the displays can be made via the sense switches and relays.

Minimum Hardware: 5K; PDP-12; EAE
Source Language: DIAL-MS

DECUS NO. 12-122

PDP-12 User's Monitor Command

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

This is an implementation of the DIAL user's monitor command functions as an extension of the 4K LAP6-DIAL-V2 system. It provides the user of such a system with a convenient way to zero the working area of any tape unit, merge binary files, and respecify the assembler permanent symtol tables.

Minimum Hardware: Same as 4K DIAL
Other Programs Needed: LAP6-DIAL
Source Language: LAP6-DIAL

DECUS NO 12-123a

OS/8 VR12 Handler

Edward Rapoport, Institute of Child Development, University of Minnesota, Minneapolis, Minnesota
Revised by: Roger Abel, Colorado State University, Fort Collins, Colorado

The VR12 handler is an OS/8 - PS/8 output handler which utilizes the standard VR12 cathode ray tube display of the PDP-12 as a standard OS/8 device-independent output device. This two page handler displays ASCII text frame by frame with the user controlling the advancing of frames from the console keyboard.

Minimum Hardware:	8K PDP-12 with VR12 scope
Other Programs Needed:	OS/8 BUILD or CONFIG source
Restrictions:	Output buffer must begin on even address. Binary is in OS/8 Build device handler format
Source Language:	PAL-8

DECUS NO. 12-124

FR, FDIS and FADC for PDP-12 Input/Output

Lawrence Moss, Cardiopulmonary Lab., University of Vermont, Burlington, Vermont

Three special patches to PS/8 FOCAL are implemented for use with the special LINC mode input-output devices of the PDP 12. These are FADC for the analog-to-digital converters, FDIS for the KW12 (KW14) display, and FR which will sample the sense switches and turn any relay on or off.

Minimum Hardware:	8K PDP-12 with mass storage device
Other Programs Needed:	PS/8-12, OS/8-12, OMSI PS/8 FOCAL (DECUS FOCAL8-177)
Source Language:	PAL-8

DECUS NO. 12-125

Waveform Analysis

Roy James Stanfill, University of Washington, Seattle, Washington

This is a real-time waveform analysis routine. The waveform is sampled and continuously displayed. The waveform can be frozen, via the sense switches, and the minimum and maximum values of the waveform determined (and indicated). Two cursors, controlled by the A/D Converter pots, are displayed congruous to the waveform; their horizontal and vertical absolute differences are displayed. The routine is particularly useful for analysis of physiological signals, i.e., calculation of QRS width, S-T interval, R-R interval, etc.

Minimum Hardware:	PDP-12 with TTY, API and EAE, KW12
Source Language:	DIAL-MS

DECUS NO. 12-126

WAVEFORM: Evoked Potential Analysis

T. Joe Willey, School of Medicine, Loma Linda University, Loma Linda, California

This program reads single or double-precision data from LINC-tape; displays a waveform, baseline and cursor; and finds peaks and zero-crossover points for principal evoked potential deflections. The complex waveform is reduced to fundamental waveform descriptors in terms of amplitude, latency, rise, fall and peak area. The program also estimates coefficients to an elemental waveform involving a damped sinusoidal function that characterizes the evoked potential. The program has general application in neurophysiology but may be useful to other kinds of problems involving data reduction and analysis.

Minimum Hardware:	8K PDP-12, EAE, VR12, 2 LINCtapes, TTY, A/D Converter
Source Language:	LAP6-DIAL-MS

DECUS NO 12-127

Withdrawn

DECUS NO. 12-128

GEP: A Generalized Experimental Package

Gregg C. Oden and Stanley Wong, Department of Psychology, University of California at San Diego, La Jolla, California

The Generalized Experimental Package is designed to allow the naive user of a PDP-12 to utilize its full capabilities in running a broad range of judgmental experiments in psychology, sociology, economics, etc.

The dual channel facilities of the VR-12's or VR-14's are used to allow installations with two external scopes to run two subjects completely independently; each subject may proceed at his own rate and each receives a different randomized presentation sequence. The stimuli may be any set of verbal materials, including personality trait adjectives, short sentences, product names, etc. Responses are made through use of a continuous graphic rating scale which is drawn on the scopes.

The user specifies the characteristics of his experiment with a simple conversational initialization program. This program requires no knowledge of system details and need only be run once for each new experiment.

Minimum Hardware:	PDP-12, 4K, TTY (2 external VR-12's or VR-14's to run 2 subjects)
Other Programs Needed:	Pseudo Random Number Generator (DECUS NO. L-64)
Source Language:	LAP6

DECUS NO. 12-129

OS/12S Scope Monitor Operating System

D. Lloyd Rice, University of California at Los Angeles, Los Angeles, California

This modification of OS/12 provides scope display of the user interaction for both monitor and command decoder lines. Teletype echo may be turned on or off by control characters. The scope routines are swapped out so they are invisible to all programs, making the system functionally identical to OS/12.

Minimum Hardware:	8K PDP-12 with mass storage device
Source Language:	PAL-8

DECUS NO. 12-130

COMPARE - Fast LINCtape Compare

James C. Good. Jamesville-DeWitt Central Schools, Syracuse, New York

COMPARE is an efficient means for 4K PDP-12 users to compare blocks on LINCtape. It recognizes extended units and utilizes extended addressing. The program compares 7 blocks at a time, although to minimize tape motion it alternates the reading of "from" and "to" blocks. I. E. it will alternate reading "from" & "to" blocks with reading "to" & "from" blocks. So in effect the program compares 14 blocks at a time. It also allows the user to limit the comparison to a specified section of each block.

Minimum Hardware:	4K PDP-12, TTY, TC12, One LINCtape drive
Other Programs Needed:	PAL 12-A Assembler (DECUS NO. 12-77)
Restrictions:	Must be assembled with PAL 12-A Assembler, maximum block length on tape is 4ØØ words (octal)
Source Language:	PAL 12-A

DECUS NO. 12-131

OS/8 DIBILD - Revised

John C. Alderman
Revised by: Mark F. Lewis, Civil Aeromedical Institute, Federal Aviation Administration, Oklahoma City, Oklahoma

OS/8 DIBILD is a PS/8 or OS/8 utility program to restore directories that have been overwritten. This version is a revision of John Alderman's original program (DECUS NO. 8-599), revised to correct coding that was illegal on straight (or 'classic') PDP-8's. One option has been added.

Minimum Hardware:	Any PS/8 or OS/8 installation with LINCtape
Source Language:	PAL-8

DECUS NO. 12-132

LISP 1.5 Interpreter for PDP-8 with OS/8 (PS/8), OS/12

Larry Davis, Washington University and Torbjorn Alm, Autocode AB
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Modified version of 8-102a for use under OS/8 (PS/8,) OS/12. OS/8, OS/12 file input and output is allowed, which allows the user to prepare LISP programs using OS/8, OS/12 EDIT. Input and output in ASCII. Facilities for writing own code in assembler to be added to the interpreter for evaluation of special functions are provided for.

Minimum Hardware:	PS/8, OS/8 or OS/12
Other Programs Needed:	PS/8, OS/8, OS/12 Operating System
Storage Requirements:	8K
Source Language:	PAL-8

DECUS NO. 12-133

MINT - Multiple Precision Integer Arithmetic Subroutine

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

Arithmetic and input-output subroutines are provided for multiple precision integers.

Minimum Hardware:	PS/8, OS/8, OS/12
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-134

RWDF32

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

This FORTRAN and SABR callable program allows blocked input and output from DF32 disks where the block size is a parameter.

Minimum Hardware:	PS/8, OS/8, OS/12, DF32 disk
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-135

MAC8, 8K MACRO ASSEMBLER

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MAC8 is an 8K assembler which runs under PS/8, OS/8 or OS/12. It allows macros to be written along with other assembly language instructions.

DECUS NO. 12-135 (Continued)

Minimum Hardware:	PS/8 OS/8, OS/12
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO 12-136

MOVE

Larry Davis, Carl Ralston, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

MOVE is an OS/8 program for transferring files from one directory device to another directory device. It is efficient since it reads the input and output device directories only once.

Minimum Hardware:	OS/8, OS/12 configuration
Other Programs Needed:	OS/8 or OS/12, Version 1 (May work with OS/8, V2)
Storage Requirement:	8K
Miscellaneous:	Changes given in document to make MOVE work with PS/8
Source Language:	PAL-8

DECUS NO. 12-137

PAL12D

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

PAL12D (Davis) is a modification of the PAL-8 Assembler to allow either PDP-8 or LINC mnemonics.

Minimum Hardware:	PS/8, OS/8, OS/12 Configuration
Storage Requirement:	8K
Source Language:	PAL-8

DECUS NO. 12-138

ISEL

Larry Davis, Washington University, St. Louis, Missouri
Submitted by: Robert Hassinger, Liberty Mutual Research Center, Hopkinton, Massachusetts

It is often desirable to check if a certain LINCtape unit is selected or write-enabled before doing some operation on it, in order that a message may be printed if not.

ISEL is a FORTRAN or SABR callable function which returns -1 if the unit specified is not selected, returns Ø if the unit specified is selected and not write-enabled, and returns 1 if the unit specified is selected and write-enabled.

Minimum Hardware:	PS/8, OS/12, PDP-12 LINCtape
Other Programs Needed:	PS/8 FORTRAN or PS/8 SABR
Source Language:	SABR

DECUS NO. 12-139

BURST Analysis Package

John T. Williams and Thomas L. Babb, U.C.L.A. Center for Health Sciences, Los Angeles, California

This package contains three programs for editing point process data from STAP-12 trains into definable bursts (minimum of two intervals) (BRSTEDIT), which can then be printed sequentially (BRSTPRNT) and stored as a continuous train for statistical analysis (BRSTRAIN).

Minimum Hardware:	4K PDP-12
Other Programs Needed:	STAP-12 (DECUS NO. 12-34)
Restrictions:	Acceptable input limited to stap-12 trains
Source Language:	DIAL-MS

DECUS NO. 12-140

NAEP - Nerve Action and Evoked Potentials

T. J. Willey, N. Fleming and F. Roos, Loma Linda University, School of Medicine, Loma Linda, California

The programs in the NAEP series were developed for investigations of neuro-electric events in the nervous system. Some are specific to a particular environment or experimental outlook but most have general applicability to data processing in the neurosciences. All are called through an executive and are rapidly and easily available for transitions from one to the next. The system is interactive and adaptive to a wide variety of uses.

Minimum Hardware:	8K, A/D converters, VR12, 2 LINC transports, EAE, TTY, Cal-Comp Plotter, X-Y plotter
Restrictions:	Source stored in extended tape format
Source Language:	LAP6-DIAL-MS

DECUS NO. 12-141

$CORREL - Intercorrelation Program for 50 Variables

David A. Paskewitz, Ph.D. and Robert L. Hufgard, Unit for Experimental Psychiatry, Institute of the Pennsylvania Hospital, Philadelphia, Pennsylvania

Reports Mean, Standard Deviation, Sum of Scores, Sum of Squares and Correlation Coefficients for up to 50 by 50 variable matrix. Designed to be both versatile and usable by inexperienced personnel. Once the initial scope-presented dialog is completed and data entered at the teletype, the program will run without further intervention by the user. Options for sub-group analysis with computation of Mean and Standard Deviation, with or without the correlation matrix, are provided.

Minimum Hardware:	8K, Scope, Mass Storage, ASR33
Other Programs Needed:	FOCAL-12 running under DIAL-MS
Source Language:	FOCAL-12

DECUS NO. 12-142

FOCALSD

Mack W. Overton, Jr. and Larry L. Alber, U. S. Food and Drug Administration, Chicago, Illinois

Utilizes the user function as entrance to the FOCAL-12 file storage area.

Minimum Hardware:	DF32 disk
Storage Requirement:	FOCAL-12 (DEC-12-AJAA-D)
Source Language:	DIAL-MS

DECUS NO. 12-143

DSLIS - Dear Start Loader and Index Statistics

Edward Rapoport, University of Minnesota, Minneapolis, Minnesota

Dead Start Loader and Index Statistics is a 3-part utility routine for DIAL residing in DIAL's free blocks. DSLIS allows easy loading of any DIAL program without having to go through the intricacies of the DIAL editor. It is called from a dead start via a simple switch register command (similar to and simpler than DIAL). Then any DIAL program name may be typed in via a QANDA frame and the program is loaded and started.

Another part of DSLIS is called by the DIAL "MC" monitor command. It displays the number of free blocks on a tape or disk and the location and size of the biggest free space. Another "MC" command also unloads all active LINCtapes.

Minimum Hardware:	4K PDP-12 with LINCtape
Source Language:	LAP6-DIAL

DECUS NO. 12-144

ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)

R. Cooper, W. J. Warren, P. V. Pocock, Burden Neurological Institute, Bristol, England

ANECDOTE is a package of 12 programs useful in the analysis of electroencephalographic and other similar time-series data. Included are programs for general data manipulation such as scaling, integrating, rectifying, filtering and also for plotting, averaging, correlation, frequency analysis (FFT) and pattern recognition. Data is assumed stored on LINCtape (1600_8 blocks), 1 sample/block, 1 point/word. Updated versions of DECUS library programs 12-63 are included, as are a few tape handling programs.

The FPP 12 floating point processor is used in two of the programs and a number of them utilize an incremental plotter.

Minimum Hardware:	8K, PDP-12, Incremental Plotter, FPP12, TTY
Miscellaneous:	DECUS library programs DECUS NO. 12-63 are included in updated versions
Source Language:	DIAL-MS

DECUS NO. 12-145a

CREFNMAP

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This is an 8K cross referencer which handles up to 753_{10} symbols and 4095-2*NSYM references. Its main advantage is in its ability to cross reference some programs which are too big for CREF12 (which has a maximum capacity of NSYM*5 + NREF= 4094). CREFNMAP will work with listapes produced by either DIAL or DUAL (DECUS NO. 12-120a). With DUAL listapes, it can produce a core usage map as well.

Minimum Hardware:	8K, EAE, TTY (preferably ASR35)
Other Programs Needed:	DIAL-MS
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-146

$CORR. (FOCAL Version)

Jim Hoare, Lakeshore Psychiatric Hospital, Toronto, Ontario, Canada

This program computes the means and standard deviations and the matrix of correlation coefficients for multivariate data.

For the long version it will take a little time for the results. (Example: 40 minutes for 30 variables by 15 subjects.)

Minimum Hardware:	PDP-12 with TTY
Source Language:	FOCAL-12

DECUS NO. 12-147

*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples

Hermann Kremer, Technische Hochschule Darmstadt, Darmstadt, Germany

This program computes real-valued bandlimited periodic functions and the Hilbert transform of such functions, if a set of equidistant samples is given. The program can be used in electrical engineering and for the approximation and interpolation of functions.

Minimum Hardware:	8K, Magnetic Tape Unit, Display Scope
Source Language:	FOCAL-12 running under DIAL Monitor

DECUS NO. 12-148

STATIS12, A Statistical Package for the PDP-12

P. C. Diegenbach, University of Amsterdam, Amsterdam, Holland

Statistical package with scope displays to chain to 40 chainable FOCAL-12 programs. Included are normal basic statistics for non-grouped and grouped data, t-test, skewness and kurtosis, variance analysis, Sheffe-contrast, regression, correlation, eigen-values, principal axis (with display), comparison with normal, binomial, negative binomial, poisson, hypergeometric and logarithmic distributions and nonparametric statistics.

The user reacts by answering on the TTY the questions on the scope. Knowledge of computer functioning is unnecessary.

Minimum Hardware:	8K, Display, 1 (preferably 2) tape unit(s)
Other Programs Needed:	FOCAL-12, DIAL Monitor
Source Language:	FOCAL-12

DECUS NO. 12-149

XPIP8: PDP-12 DECtape PIP

Douglas E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

XPIP8 is a special version of PS/8 PIP for PDP-12 owners with the TC12-F option. XPIP8 allows direct reading and writing of PS/8-OS/8 DECtapes mounted on any LINCtape drive on a PDP-12. It will only work on those machines equipped with the TC12F option.

Minimum Hardware:	8K, TC12-F option
Other Programs Needed:	PS/8, OS/8 or DECsystem-8 (DECUS NO. 8-646)
Source Language:	PAL

DECUS NO. 12-150

XPIP1Ø: PDP-10 DECtape to LINCtape Converter

Douglas E. Wrege, Georgia Institute of Technology, Atlanta, Georgia

PIP1Ø is a PIP for PS/8 that handles PDP-1Ø DECtapes. This version reads PDP-1Ø DECtapes directly via the TC12F hardware option on PDP-12 LINCtape drives.

Minimum Hardware:	8K PDP-12, TC12-F option
Other Programs Needed:	PS/8, OS/8 or DECsystem 8 (DECUS NO. 8-646)
Source Language:	PAL

DECUS NO. 12-151

"PSYCHO," A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics

Thomas H. Harding and J. Terry Yates, Purdue University, West Lafayette, Indiana

The "PSYCHO" system is an elaborate set of programs which control all facets of an animal psychophysical experiment. The system consists of three separate programs which are simultaneously core resident. The programs control the stimulus presentation and experimental contingencies, collect "on-line" data, analyze the data statistically and summarize the data by means of a teletype "print-out," hard-copy graphs and paper-tape output. The psychophysical method employed is that of Blough. The general method has application to numerous animal psychophysical tasks in which "titration" schedules are used. Instructions for program modification are included in the program text.

Minimum Hardware:	8K and KW12-A clock, ASR33 Incremental Plotter
Other Programs Needed:	Floating Point Program (DEC-12-YQ1B-PB)
Source Language:	DIAL-MS

DECUS NO. 12-152

LOAD31K, A Loader for DIAL-MS and 32K of Core

John R. Raines, Northwestern University Medical School, Chicago, Illinois

The DIAL system offers only an 8K binary work area and hence no facilities for loading programs into memory fields above Field 1. This program loads up to 4 binaries and all but the last 1400 words of core.
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Minimum Hardware:	DIAL-MS Configuration, 32K of Core, EAE
Other Programs Needed:	DIAL-MS; DUAL32; CREF32 (These files are all included on tape)
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-153a

DUAL32, DUAL-28K Assembler

John R. Raines, Northwestern University Medical Center, Chicago, Illinois

DUAL 32 derives from DUAL. In addition to the features of DUAL, it has: nestable conditional assemblies, nestable literals, special character for PAL8 compatibility, larger I/O buffers for reduced LINCtape motion, larger symbol table (roughly 2000 symbols), improved listing control for chained assemblies, and provision for producing multi-LISTAPE listings.

Minimum Hardware:	DIAL-MS Configuration, ASR35 preferable, EAE
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-154a

CREF32

John R. Raines, Northwestern University Medical Center, Chicago, Illinois

CREF32 is a 24K version of CREFNMAP. It is much faster, allows more symbols, more references, produces a 32K rather than 8K core map and will process listings which overflow onto a second tape (produced by DUAL32).

Minimum Hardware:	DIAL-MS Configuration, 24K, EAE, ASR35 preferable
Restrictions:	Poor format with undefined symbols on DUAL LISTAPES
Source Language:	DUAL (DECUS NO. 12-120a)

DECUS NO. 12-155

MARK12XØ

John R. Raines, Northwestern University Medical School, Chicago, Illinois

This is a version of MARK12 which includes the 128 word block format. In addition it can determine the tape block size on the tape mounted on unit Ø and can copy tape Ø onto tape 1 after formatting tape 1. The program will bootstrap either DIAL-MS or OS/12 on completion.

Minimum Hardware:	8K PDP-12, DIAL-MS, LINCtape
Source Language:	DUAL 32 (DECUS NO. 12-153)

DECUS NO. 12-156

MUSIC12

Philip H. Jensen
Submitted by: James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

MUSIC12 is a program for the PDP-12 user which allows use of the teletype keyboard as a piano keyboard. There are 4 octaves of notes, including sharps and flats. The music can be played directly from the keyboard, or from previously punched paper tape via the teletype paper tape reader.

Other Programs Needed:	Monitor Command
Source Language:	LAP6-DIAL

DECUS NO. 12-157

PLOTVS, Device Independent Graphics

Dennis McGhie, Stanford Medical Center, Stanford, California

PLOTVS was written to allow plotting on three dissimilar graphics devices from a single set of software. Plotting programs are written to drive an incremental plotter, except the plotter commands are buffered to an OS/8 file. PLOTVS reads this file and plots the picture on an incremental plotter, a storage scope, or a line oriented plotter.

Minimum Hardware:	PDP-12 (or 8/I, 8/L or 8/E), EAE, Incremental Plotter, Storage Scope, Versatec MATRIX 200A Printer/Plotter
Other Programs Needed:	OS/8, User written plotting program
Source Language:	PAL-8

DECUS NO. 12-158

FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's

Mark J. Hyde, Jamesville-DeWitt Central Schools, Jamesville, New York

FASTCOPY provides the 4K PDP-12 user with an efficient means for copying data stored on LINCtape. It operates properly with tapes containing any number of blocks and with blocks of up to 3584 (7ØØØ octal) words. The program adjusts itself to copy the largest group of blocks that will fit in 4K at one time. For example, 256 word blocks are copied in groups of 14 (1Ø). The program also operates correctly on groups of blocks that extend across the transition from negative to positive block numbers.

Minimum Hardware:	PDP-12, TTY, 2 LINCtape drives
Other Programs Needed:	PAL12A (DECUS NO. 12-77) and User's Monitor Command (DECUS NO. 12-122). Both are included on tape
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-159

PLAYBOY

Walter Weiskopf and James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

PLAYBOY prints the image of the playboy bunny in either of 2 colors; black or white, on an 8 1/2 x 11 paper form.

Minimum Hardware:	PDP-12, LS8E or LPØ8 Line Printer (The printing device IOTs can easily be changed.)
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-160

CCTGEN - Carriage Control Tape Generator

James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

CCTGEN will generate carriage control tapes whose form and tab stops are at intervals defined by the operator.

Minimum Hardware:	PDP-12, ASR33
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-161

BIGCHARS

Roy D. Eassa, Jamesville-DeWitt Central Schools, DeWitt, New York

BIGCHARS displays 5 X 7 characters on the VR12 scope and prints enlarged patterns on the LS8E line printer. All printing teletype characters are acceptable.

Minimum Hardware:	PDP-12, VR12 scope, ASR33, LS8E
Other Programs Needed:	PAL12A (DECUS NO. 12-77)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-162

COREDIT

Roy D. Eassa, Jamesville-DeWitt Central Schools, DeWitt, New York

COREDIT displays core locations on the scope, prints them out, allows modifications and has a word search option.

Minimum Hardware:	PDP-12, VR12 scope, ASR33
Other Programs Needed:	PAL12A and User's Monitor Command (DECUS NOs. 12-77 and 12-122)
Storage Requirement:	4K
Source Language:	PAL12A

DECUS NO. 12-163

AD74 - High Speed Analog to Digital Conversion Program

Barrie F. Walker, Institute of Oceanography, University of British Columbia, Vancouver, Canada

AD74 is a fast analog to digital conversion program. Analog data input is through the standard 16 channel PDP-12 A-D converter. Digitized data is recorded on 9 track tape with the IBM compatible TU-1Ø drive.

For a single input channel the maximum rate is about 16000 samples/second. This limit is made possible by using the RK8 as a buffer between core and tape.

For applications where an RK8 is not available, or where high speed is not essential, data may be dumped on tape without disk buffering at a maximum rate of about 5000 samples/second.

Minimum Hardware:	PDP-12 A-D inputs, TU-1Ø tape, KW-12A clock, RK8 disk (optional), VR12
Storage Requirement:	8K
Source Language:	DIAL

DECUS NO. 12-164

DIAL.EXT

John R. Raines, Northwestern University Medical School Chicago, Illinois

This is an extension of DIAL-MS for 1600 blocks (DECUS 12-110) which uses tape blocks 356 and 357 to provide 12 additional monitor commands including SQUASH and String search. "AP" has been speeded up. Provision for addition of 7 more commands has been made.

Many of the routines will run in 8K or 12K. Some modifications will be desirable for almost any other installation.

Minimum Hardware:	PDP-12, DIAL-MS Configuration, EAE
Source Language:	DUAL 32 (DECUS 12-153)

DECUS NO. 12-165

NAP SYS: Program to Analyze Neuronal Spike Data

William J. Vaughn
Submitted by: Edward V. Evarts, M. D., National Institute of Mental Health, Bethesda, Maryland

The program accepts as input two channels of analog data, one of which contains pulses at least 1 msec apart and the other being a control signal consisting of seven separate DC voltages. The first channel will usually represent continuous spike activity from a single neuron cell (it should not be the raw recording, however, but the output of a pulse generator whose input is the raw neuron potential), and the second a time record of stimulus and responses of some task performed during the recording.

The system does the following:

1) Translates the analog data into a digital record on LINC-tape in a standard format; 2) Reads the digitized data from LINCtape and forms a raster, histogram and neural response display; 3) Outputs the data via a printout or by some suitable photographic setup.

The unique feature of this system is the ability to easily correlate spike activity not only with the stimulus but also with the response. The system is self-contained and may be loaded from the switches or from "DIAL." It requires an 8K PDP-12 with a KW12 clock, A-D channels, and two LINCtape transports. An "Interface" box will also be needed to monitor and control the two input channels from the tape recorder. The digitizing process is run separately from the analysis program, and other programs are available to catalog and label the data.

The system requires no programming experience to use, but some acquaintance with the PDP-12 will be necessary.

The system has its own Monitor/Loader which is loaded from the switches or which may be loaded from LAP6-DIAL by (LF) NAP,O (CR). The Monitor/Loader presents the "menu" of programs which are then loaded and started by use of the keyboard. The binaries cannot be loaded independently by the DIAL loader as they have no header block.

DECUS NO. 12-165 (Continued)

A system for generating two analog tape channels which the system digitizes is necessary. The digitizing resolution is 1 msec, whereas the final displays only show a 2 msec resolution.

Source Language: LAP6-DIAL

DECUS NO. 12-166

OS8-VC12 Display Device Handler for the PDP-12

Gotz Romahn, Heinrich Hertz Institut, Berlin, Germany

The VC12 handler is a two-page output device handler for the PDP-12 display. It conforms to all OS/8 device handler standards, especially check for CTRL/C as a monitor call, error exit, when trying to read with the display and normal exit if zero pages of text are specified to be transferred. Advancing through the output file is done by typing any key on the teletype (except CTRL/C).

Minimum Hardware: OS/8, VC12 Display Controller
Other Programs Needed: OS/8 BUILD
Storage Requirement: 2 pages
Source Language: PAL-8

DECUS NO. 12-167

FOCAL Patches

P. C. Diegenbach, University of Amsterdam, Amsterdam, Holland

Eight FNEW, FX and FZ subroutines for FOCAL-12. Some may also be used under FOCAL '69. Their purposes are to use the Tektronix display terminal 4010 (8 and 12), to use a second teletype-like device (8 and 12), to type out an integer as consisting of two characters (8 and 12), to read in specified DIAL programs (12), and to read in the DIAL monitor (12).

Other Programs Needed: FOCAL-12 (or FOCAL '69)
Storage Requirement: 2K
Source Language: DIAL (PAL)

DECUS NO. 12-168

Spectral Analysis System

Frieda Roos and Noel Flemming
Submitted by: T. Joe Willey, Ph.D., Loma Linda University, Loma Linda, California

The Spectral Analysis System is a series of programs developed for processing EEG data. To facilitate transitions from one to another, the programs have been placed in an executive. The system is designed to handle one channel at a time to allow for more flexibility. However, data from several channels can be digitized simultaneously and then separated into single channels for the analysis. This set of programs was developed for a particular environment, but could be applicable to a wide variety of settings. The system consists of the following programs:

DIGITIZE: Converts up to 16 channels of analog input signal to digital data stored in LINCtape with no gaps in real time.

DATA UNSCRAMBLER: Unscrambles interleaved data from up to four channels stored by DIGITIZE.

WILD POINT EDITOR: Checks digital data for possible artifacts by finding points of large amplitude. The editor has several editing options.

FFT POWER SPECTRA: Computes power spectra by the sum of the squares of FFT coefficients and stores 64 components per spectrum on LINCtape. Also the program creates a format block. It uses DECUS 8-143 as the computing kernel.

FORMATTER: Accepts alphanumeric identification of data and control parameters to be used by AUTOMATIC PLOTTER.

AUTOMATIC PLOTTER: Plots serial FFT spectra using hidden line suppression methods from data stored on LINCtape according to format control parameters. Alphanumeric identification is plotted with the group. This program can bootstrap from one format block to the next for continuing operations.

FREQUENCY BAND PLOT: Computes and plots averages and standard deviations for a specified frequency band from spectra stored on LINCtape and displays them sequentially. The band plot can be plotted or typed out; alphanumeric identification is included with the output.

SPY: Moving window display of data on tape (modified from DECUS No. 12-57).

Minimum Hardware: PDP-12 with 8K core, VR12 display and 2 LINC transports; KE12 extended arithmetic element; AD12 A/D converters, 8 channels; ASR33 teletype or equivalent; CALCOMP plotter or equivalent
Source Language: LAP6-DIAL-MS

DECUS NO. 12-169

HISTPLOT: A Versatile Program for Cross Correlation of Point Process Data on a PDP-12

Stephen C. Woods, John T. Williams, Eric Halgren, Thomas L. Babb; UCLA Center for Health Sciences, Los Angeles, California

HSTPLT is a multi-option program for cross-correlating two STAP-12 compatible event trains. When one train is designated as a reference train, various long or short pre- and post-reference times may be selected and all or only certain reference events may be selected for computation. The computed histogram with calibrations for time and numbers of events may be plotted and simultaneously individual bin counts may be printed.

DECUS NO. 12-169 (Continued)

Minimum Hardware:	PS/8, OS/8 or OS/12 Operating System, LINCtape or other mass storage device, EAE
Other Programs Needed:	QANDA modified
Storage Requirement:	8K
Restrictions:	Not restartable
Source Language:	PAL-12 or PAL-8

DECUS NO. 12-170

INPUT, STAT, DIST: A Statistical Analysis Package for the PDP-8 or PDP-12

Stephen C. Woods, Eric Halgren, Thomas L. Babb
Submitted by: Thomas L. Babb, UCLA Center for Health Sciences, Los Angeles, California

INPUT reads and stores trains of data. STAT performs a variety of statistical tests upon these trains (X^2, RUNS, KOLMOGOROX-SMIRNOV, MANN-WHITNEY U, t- test). DIST finds the probabilities associated with some of the values given by these tests. One application of these programs is the nonparametric statistical analyses of histograms derived from neuronal spike trains, a form of point process data.

Minimum Hardware:	OS/8 or OS/12; LINCtape or other mass storage
Other Programs Needed:	FORTRAN IV (RPTS)
Storage Requirement:	8K, 12K for STAT2

DECUS NO. 12-171

Three Patches to the Clinical Lab-12 System

Mark J. Hyde, Upstate Medical Center, Syracuse, NY

1. AUTOTIME gives RE the ability to read the time of day maintained by the Monitor, thus simplifying the entry of requisitions.

2. RWARDP causes RE to print the ward along with the name in the verification line, thus providing for better patient identification.

3. WWARDP causes WO to print the ward next to the patient name on worksheets printed for workstations.

Minimum Hardware:	Clinical Lab-12
Other Programs Needed:	LAP6-DIAL-MS
Source Language:	LAP6-DIAL

DECUS NO. 12-172

WVU Utility Package

C. G. Roby, Jr., D. J. Duffy, J. A. Donnely, et al
Submitted by: T. W. McIntyre, WVU Medical Center, Morgantown, West Virginia

DX - Displays the OS/12 index similarly to DIAL's DX command. Will also print the index with an identification which is also displayed and may be changed.

IOPACK - Modifications to PIP's I/O package to simplify calling and using.

MAP - An improved bit map program which will print map, reverse map, ranges or reverse ranges.

LIST - A paged pretty lister, Lists, LS files, documents or forms with variable tabs, titles, etc. Also lists name of file in large block letters.

MARK12 - Trivial modifications to MARK12 to mark 128 word blocks with the P option and return to OS/12.

TTYLPT - A two page handler that simulates the line printer on the teletype.

PLT - A two page handler that accepts decimal ASCII input and plots on a standard XY plotter with retransmitting slidewire or null detector. Uses relay and D-A converters.

IBM - Converts OS/12 ASCII files from any input device to EBCDIC files on Magtape (TU1Ø). Also converts in the reverse direction and has an option for forms control to FORTRAN.

PSDIAL - A quick and dirty converter for OS/12 to DIAL compatible files. Writes on LINCtape starting at block Ø of Unit 1.

Minimum Hardware:	OS/8, OS/12 System; VR14 or other display, X-Y plotter, D-A Converters, LINCtape, A-D Converters, Relays, TU-10
Other Programs Needed:	OS/8, PAL-12
Source Language:	PAL-12

DECUS NO. 12-173

SCOPEFOCAL

Mark J. Hyde, Jamesville-DeWitt Central Schools, DeWitt, New York

SCOPEFOCAL is 4K FOCAL, 1969 (DEC-08-AJAE) patched to allow use of the PDP-12 scope. To circumvent the problem of FOCAL not being fast enough to refresh the display, all points are displayed from a buffer.

Minimum Hardware:	PDP-12, TTY, VC12, VR12/14
Source Language:	LAP6-DIAL

DECUS NO. 12-174

CLOCK: Digital Clock with Westminster Chimes

Michael F. Lubozynski, Vanderbilt Medical School, Nashville, Tennessee

This is a software digital clock written for a PDP-12 with the extended arithmetic element (EAE). It displays the current time, counting the line frequency on the KW12 clock control input 1, and chimes on the quarter hour. The chimes are completely modifiable and consist of a series of musical notes played on the computer speaker. The "clock" also chimes the hours.

Source Language: DIAL

DECUS NO. 12-175

PLOTZER

Klaus E. Liebold, National Institute of Mental Health, St. Elizabeth's Hospital, Washington, D. C.

A collection of programs written in FOCAL to plot point by point graphs on the Calcomp 565 plotter, label them, plot histograms, and percentage distributions.

Minimum Hardware: PDP-12 and Calcomp 565
Storage Requirement: 8K
Source Language: FOCAL-12

DECUS NO. 12-176

FOCAL-12 Overlay to Access the DF 32 Disk

University Observatory, Vienna, Austria

Access is provided to the DF 32 disk from FOCAL-12 via the FZ user function. There are two files: a 2K integer file and a 1K floating point file.

The programs are offered on DIAL-readable paper tape (source).

Minimum Hardware: PDP-12, DF32 random access disk
Other Programs Needed: FOCAL-12
Storage Requirement: 8K
Source Language: DIAL

DECUS NO. 12-177

TENNIS

Lewis Brenner, Philadelphia Police Department Chemical Laboratory, Philadelphia, Pennsylvania

The game of tennis is played on the PDP-12 computer using the VR14 display scope. The rackets are controlled by A/D knobs Ø and 4 (left paddle) and 3 and 7 (right paddle). SSWØ, when set, generates a ball from the center net. SSW5, when set, returns to the DIAL monitor on tape unit Ø. The teletype bell rings when a player scores.

Minimum Hardware: PDP-12, VR-14 display scope
Other Programs Needed: DIAL System
Storage Requirement: Less than 2K
Source Language: DIAL

DECUS NO. 12-178

NUFOCAL, Modified FOCAL-12

William E. Hatcher, Veteran's Administration Center, Temple, Texas

This program is a patch to FOCAL-12 which allows the user to specify an output device which is unsuitable for output of an error message. A line printer not easily seen from the teletype might be such a device. If an error occurs when output is to the specified device, output will be restored to the teletype.

Minimum Hardware: 8K PDP-12
Other Programs Needed: DIAL Operating System
Source Language: PAL

DECUS NO. 12-179

The Mann-Whitney U Test

Klaus E. Liebold, National Institute of Mental Health, St. Elizabeth's Hospital, Washington, D. C.

These three programs written in FOCAL-12 will perform the nonparametric Mann-Whitney U Test. For samples in which N2 is larger than 20, a Z-value will be calculated and the correction for ties applied to the sampling distribution of U. Theoretically there is no limit to the number of scores which can be analyzed.

Minimum Hardware: PDP-12, VR12 scope, TU56 tape drive
Storage Requirement: 8K
Restrictions: Extended functions must be deleted
Source Language: FOCAL

DECUS NO. 12-180

CARDDIAL - Input to the DIAL Editor Via Cards

James C. Good, Jamesville-DeWitt Central Schools, DeWitt, New York

CARDDIAL is a program which makes card input acceptable to the DIAL editor.

Minimum Hardware:	PDP-12, Card Reader, LINCtape
Other Programs Needed:	PAL-12A Assembler
Storage Requirement:	ØØØØ - ØØ777
Restrictions:	Same as for the DIAL Editor
Source Language:	PAL-12A

DECUS NO. 12-181

ATSXL - Text Display and Timing Routine for FOCAL-RT

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

ATSXL is an overlay to FOCAL-RT (DECUS 12—80) which allows a 'frame' of text to be presented on the display and the subjects response, response time and keydown time to be recorded. Up to 511 frames of up to 510 characters each may be randomly presented allowing adaptive techniques to be employed. Once the stored frame has been found display presentation is immediate. Up to 12 bits of response information can be recorded and timing is to an accuracy of 10 milliseconds. Responses are input on the external sense lines.

Minimum Hardware:	8K PDP-12 with dual LINCtapes, VR14 display, KW12A real-time clock and sense lines
Other Programs Needed:	FOCAL-RT (DECUS 12– 80) (On tape offered)
Source Language:	DIAL

DECUS NO. 12-182

KLK - A Simple Clock Overlay for PDP-12 FOCAL

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

A simple overlay of great use in elapsed time measurement which takes advantage of the ability of the KW12A clock to be stopped by an external event on any of the three clock trigger input channels. The routine assumes control of the clock and sets it counting from zero. An external event stops the clock and records which of the three possible events was present. The clock time and event code can then be read into the user's program at his leisure.

Minimum Hardware:	8K PDP-12, dual LINCtapes, KW12A, VR14
Other Programs Needed:	FOCAL-RT (DECUS 12-80) (On tape offered)
Source Language:	DIAL

DECUS NO. 12-183

DECIO - FOCAL-12 Whole Word Digital I/O Overlay

David Hale, Psychology Department, The Queen's University of Belfast, Belfast, Northern Ireland

An alternative to the practice of accessing external sense lines and relays at the individual bit level, it treats the sense lines as a 12 bit integer and the relays as a 6 bit integer. The status of the 12 bits can then be read as a decimal number between Ø and 4Ø95 and the relays controlled by outputting a decimal number between Ø and 63. Any combination of bits may then be controlled by these integers. An input pattern can be decoded to give individual bits and an output pattern set up using the decimal equivalents of the bit pattern.

Minimum Hardware:	8K PDP-12, dual LINCtapes, KW12A, VR14
Source Language:	DIAL

DECUS NO. 12-184

PPSH - Neuronal Autocorrelation and Crosscorrelation Analysis Programs (Pre-Post Stimulus Histogram)

Ramesh R. Parekh, M.S.I.E. and Hardress J. Waller, Ph.D., Medical College of Ohio at Toledo, Toledo, Ohio

PPSH (Pre/Post Stimulus Histogram) is a group of programs that, together, compute the autocorrelation and crosscorrelation functions for two concurrent sequences of events (e.g., two simultaneously recorded neuron spike trains or one spike train and one stimulus series). PPSHDATA compiles the intervals in real time as a single mixed and labeled, double precision list of indefinite length. Intervals are numbered sequentially and stored, along with relevant identifying data, on a Linc Tape train file.

PPSH1 reads a selected interval list and generates either a first order interval distribution or an n order correlation (expectation density) function. The histogram is displayed and may be plotted along with a calibrated scale. Total event counts and histogram areas are typed out as octal numbers.

HISTDUMP temporarily saves the histogram in a reserved four block section of Linc Tape on unit Ø for subsequent printout by TAPEDUMP (DECUS 12-2).

Minimum Hardware:	PDP-12 with 8K core, VR-12 display and dual Linctape; KW12A real time clock; KE-12 Extended Arithmetic Element; ASR33 Teletype or equivalent; Incremental plotter (optional)
Source Language:	LAP6-DIAL

DECUS NO. 12-185

Horoscope Casting Routines - Astrodynamical Subroutines

David L. Hindman, University of Texas Phonetics Laboratory and ARBEC, Inc., Austin, Texas

A collection of FORTRAN II subroutines which perform the astrodynamical, calendrical, and geographic computations made in the process of casting horoscopes. Primary components are: an ephemeris routine, a calendrical routine, and a routine to perform house setups.

The routines are not warranted and are to be used for fun only.

Other Programs Needed:	FORTRAN Compiler
Storage Requirement:	16K
Restrictions:	Will not cast horoscopes for latitudes greater than 66 degrees North or South
Source Language:	FORTRAN II

DECUS NO. 12-186

COBRA Assembler for the PDP-12

David L. Hindman, University of Texas Phonetics Laboratory and ARBEC, Inc., Austin, Texas

COBRA is a macro assembler for PDP-12s having at least 16K of core and the EAE. COBRA runs under PS/8 and produces binary output compatible with ASBLDR. The user may maintain system macro text in a file called SYSLIB and may also keep other text libraries. Other COBRA facilities are: qualified symbols, text parameterization, LMODE/PMODE assembly, and a DIAL simulation mode. A library of PS/8 linkage macros is included.

COBRA is configured for a system with a Centronics line printer, but is largely compatible with teletype output systems.

Minimum Hardware:	EAE and disk recommended
Restrictions:	Known defect in symbol table routine (symbol type not tested properly). Source text does not include form feed codes
Source Language:	COBRA

DECUS NO. 12-187

OS/8 Device Handlers for PDP-12 Core

James E. Randall, Indiana University, Bloomington, Indiana

These system and non-system device handlers are designed for a PDP-12 with Linctape as the mass storage device and with 32K of core. The handlers can reduce tape shuffling by keeping directories, systems area, or files in upper core. The handlers, their listings, and initialization and restoration routines are supplied on a Linctape which can be started from the console bootstrap. Full documentation is obtained in the file HOW.DC on the tape. The tape is OS/8 Version 3 and will not support earlier versions.

Storage Requirement:	32K
Source Language:	PAL-8

DECUS NO. 12-188

4K DISK/LINCTAPE MONITOR

Mark J. Hyde, 209 Ardsley Drive, DeWitt, New York

The 4K Linctape monitor is the disk/DECtape monitor with patches to allow it to use TC12 Linctape. The documentation contains many patches which are also of use to PDP-8 users of the disk/DECtape.

Minimum Hardware:	PDP-12, TTY, any disk or Linctape
Storage Requirement:	4K
Source Language:	PAL-D

DECUS NO. 12-189

DECtape Reader Handler for PDP-12

Gotz Romahn, Heinrich Hertz Institut, Berlin, Germany

This handler allows direct reading of DECtapes via the TC12F option. All OS/8 - V3 programs may be used.

Minimum Hardware:	PDP-12 with TC12F option and EAE
Other Programs Needed:	OS/8 BUILD
Restrictions:	Possibly will not run on a very slow PDP-12 and a very fast tape drive
Source Language:	PAL-8

DECUS NO. 12-190

PDP-12 Functions for OS/8 BASIC

Edward M. Schmidt, Laboratory of Neural Control, National Institute of Neurological Diseases and Stroke, National Institutes of Health, Bethesda, Maryland

This program contains 16 functions for the operation of OS/8 BASIC on a PDP-12. The functions include the clock, analog to digital conversion, sense lines, sense switches, relays, scope, digital input and output, and bit manipulation. The program constitutes the user function overlay provided for in OS/8 BASIC called BASIC.UF.

Minimum Hardware:	PDP-12, KW12 clock, Digital input and output registers (optional)
Other Programs Needed:	OS/8 BASIC
Storage Requirement:	5 octal pages
Source Language:	PAL-8

DECUS NO. 12-191

MTXIO - Multitasking Executive

S. R. Deller, M. Quinn, J. R. Raines (Documentation by F. J. Lewis); Northwestern University Medical School; Chicago, Illinois

MTX is a multitasking (real-time) executive for the PDP-12. It schedules tasks, performs A/D conversions and controls other I/O devices. No file structure is supported/imposed on mass storage devices by MTX itself and the MTX executive schedules core resident tasks only (see PSX subroutine). Analog to digital conversion is performed with a double-buffering technique to facilitate continuous sampling concurrent with processing of the signal. I/O device handlers may be added fairly easily. Currently supported are: teletype, LINCtape, DF32, KW12, DP12, DB12, AD12, Centronix Line Printer, and Ann Arbor Terminals

PSX is a subexecutive task which runs under MTX (actually 3 or 4 copies run as separate tasks). This task imposes the file structure on the mass storage devices, loads non-core resident programs into core when they are scheduled by MTX and provide a succinct subroutine call for core overlays from the mass storage devices. Utility programs which run under one copy of this subexecutive list LISTAPES; examine and modify core/disk/tape; print the PSX catalog; print DIAL tape catalogs and source programs; type core dumps; determine the number of processor cycles available at a new background priority level.

Minimum Hardware:	PDP-12, TTY, LINCtape, DF32, AD12, KW12A
Storage Requirement:	3K plus EAE
Miscellaneous:	Will handle more than 30 tasks; room for many additional device handlers
Source Language:	DUAL (DECUS 12-120)

DECUS NO. 12-192

ASFLO - Packed ASCII to Floating Point Format Conversion

Klaus E. Liebold, NIMH/IRP/SMR, St. Elizabeth's Hospital, Washington, D. C.

Numbers stored as packed ASCII characters (2 characters/word) will be converted to floating point format (1 number/3 words). Especially useful in conjunction with DCON-10 which translates a DEC-10 tape into a DIAL source file. This program can then be used to generate real numbers for a FOCAL-12 data file. Each complete ASCII character number must be terminated by a carriage return. The TC-12-F option is only necessary if DCON-10 or PRTC-12 is used.

Minimum Hardware:	PDP-12, TC-12F Option
Other Programs Needed:	DIAL-MS, DCON-10
Storage Requirement:	8K
Source Language:	LAP6-DIAL

DECUS NO. 12-193

A Set of FORTRAN Callable DF-32 Routines for the PDP-12

Rudolf Albrecht and Helmut Jenkner; University Observatory, Vienna, Austria

These routines differ from the usual OS/12 drivers in that a nonsystem DF32 handler is implemented so the disk can be addressed even if it is not the system device and without lengthy calls to the USR. Variable amounts of data (integer of floating point) up to 2K can be transferred to and from any place in core.

Minimum Hardware:	PDP-12, DF-32 disk(s)
Other Programs Needed:	OS/12
Storage Requirement:	256 (decimal)
Source Language:	SABR

DECUS NO. 12-194

Split Plot Factorial Analysis of Variance- %SPFAV

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%SPFAV is an analysis of variance program for data suitable for analysis by the split plot design. Two or more groups can be studied with two or more levels in each group and the number of subjects in each group need not be equal but must be greater than 1. The program computes the appropriate "t" and "F" ratios.

Monitor/Operating System:	FOCL-12K
Core Storage Required:	12K
Source Language:	FOCAL

DECUS NO. 12-195

TRIGSYS - A Multichannel Fast Point Process Data Acquisition

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TRIGSYS consists of two programs, FASTTRIG and CONVERT. These programs are written for the PAL-12 assembler and must be assembled by that program.

FASTTRIG is an eleven channel digital input program for the PDP-12. It was written to replace the STAP-12 sub-program EVENT3, and was specifically designed to eliminate many of the restrictions found in that program. In particular: only 3 input channels, fixed sample rate, and a maximum of 2047 data points per run.

This program allows several sample rates, eleven input channels and a maximum of 520 K sample points per run.

DECUS NO. 12-195 (Continued)

CONVERT is the second half of TRIGSYS. It takes the output of FASTTRIG and produces STAP-12 compatible data trains on a 256 word blocksize LINCtape containing a STAP-12 directory.

Monitor /Operating System:	OS/8 - OS/12
Core Storage Required:	8K
Hardware Required:	One mass storage device, EAE, 12-bit Digital Input (DI-12), one LINCtape
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	Cannot use LINC system device handler (or any co-resident handler)

DECUS NO 12-196

TRALIB - Point Process Data Library and Editor

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TRALIB is a combination of two programs: 1) GARBAGE-MAN, which allows the user to edit event trains which might contain sequences of events with known errors. STAP-12 compatible event trains may be modified automatically by a selectable pseudo-low-pass filter or manually for specified events in the train. 2) INDEX, which is a printer program for the STAP-12 AIB (Additional Information Blocks). It formats STAP-12 compatible output (with space for tabs and ignoring control characters) and prints (after all the AIBs) the number of free trains and free blocks (896 is the assumed maximum).

Monitor/Operating System:	OS/8
Core Storage Required:	8K
Hardware Required:	1 LINCtape, one other mass storage device, EAE
Other Software Required:	SUPRQA (DECUS 12-197)
Source Language:	PAL-12

DECUS NO. 12-197

SUPRQA - Super QANDA

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SUPRQA is a modification of QANDA (DECUS 12-56) with the following new features:

1) Waits for the TTY flag before typing; 2) doesn't display a space before answer; 3) doesn't initialize answer buffers; 4) takes line feed exit with C(AC)-7777 on CTRL C.

Entry point and refresh point are unchanged.

Core Storage Required:	512 (5000-5777)
Hardware Required:	TTY, VR12
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	TTY flag must be set before entry

DECUS NO. 12-198

BURST, V2 - A Point Process High Pass Filter

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BURST V2 is a STAP-12 (1) compatible point-process 'BURST' detection program.

This progam is a merged and rewritten version of DECUS 12-139(2) with some major modifications. These modifications are:

1) The three separate sections of BURST (BRSTRAIN, BRSTEDIT, and BRSTPRNT) have been combined into one easy to use module.

2) The program is now OS/8 compatible and in fact uses the OS/8 device independent I/O capability.

3) Variable detection window size and time.

4) Variable printing resolution.

Monitor/Operating System:	OS/8 or OS/12
Core Storage Required:	8K
Hardware Required:	LINCtape, mass storage (RK01, PF32, etc), EAE, printer or TTY
Other Software Required:	STAP-12 (DECUS 12-34) or TRIGSYS (DECUS 12-195)
Source Language:	PAL-12
Restrictions, Deficiencies, Problems:	Input must be STAP-12 format, not limited to 2048 events

DECUS NO. 12-199

CPRINT. SB: Utility Subroutines for a Centronics 101A Printer

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Special features of a Centronics Model 101A Printer, such as elongated character mode, bell, line feed, vertical tabs, form feed, delete, programm-controllable select and deselect, are enabled by a package of eight simple FORTRAN - or SABR- callable subroutines. These routines should work in any OS/8 or OS/12 environment using the appropriate line printer.

Monitor/Operating System:	OS/8, OS/12
Core Storage Required:	128 words
Hardware Required:	Centronics Model 101 A Printer
Other Software Required:	SABR
Source Language	SABR

DECUS NO. 12-200

MULT-PS2 Multiple Printing Source Program

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MULT-PS2 allows the user to "batch" print as many sources as he wants. Input is on mark sense cards and output is on either the system teletype or line-printer.

Monitor/Operating System:	LAP6- DIAL
Core Storage Required:	8 PDP-8 pages
Hardware Required:	PDP-12, 2 Linctape Drives, Mark Sense Card Reader, LPT or TTY
Other Software Required:	PAL-12A (DECUS 12-77), DIAL
Source Language:	PAL-12A
Problems, Deficiencies, Restrictions:	Must have DIAL, will not print tabs

DECUS NO. 12-201

DPSPV3: Double Precision to Single Precision Integer Converter

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Program DPSPV3 is an extension of DEC's SINPRE program (DEC-12-UW4A-D) and is used to convert Linctape-based double precision files into Linctape-based single precision files. DPSPV3 will run under OS/8 and contains sense switch options for the PDP-12 that permit: 1) looping of the conversion routine, 2) choice of 8 or 11 bit conversion, 3) choice of double precision data format, i.e. high/low or low/high, 4) saving of the scale factor generated when scaling double precision data to single precision data. The program has been used extensively on double precision data tapes from signal averaging programs and spectral analysis programs in order to generate single precision tape files acceptable to FORTRAN II data analysis programs.

Monitor/Operating System:	OS/8
Core Storage Required:	4K
Hardware Required	PDP-12, VR14, LINC tapes
Other Software Required:	SINPRE (DEC-12 UW4A-D)
Source Language	PAL 12

DECUS NO. 12-202

PLOT8CH: 3-Dimensional Plotting of EEG Data

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This program combines FETCHFFT (DECUS 12-63) and PLOT3D (DECUS 12-43) and has been modified to plot 8 channels of transformed EEG data stored in double precision on LINC tape. Up to 4 channels may be plotted at a time across one page of plotter paper. Previous data is not overwritten resulting in a 3-dimensional effect. Upon completion of the first 4 channels the paper automatically advances one page and the program retrieves and displays the first blocks of the next series of channels (up to 4).

Core Storage Required:	8K
Hardware Required:	Complot Incremental Plotter, TU56
Other Software Required:	OLFFT1 or equivalent
Source Language:	LAP6 DIAL