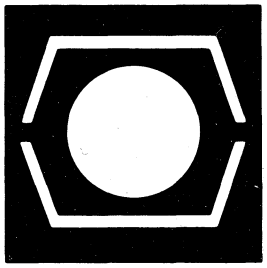

DECUS PROGRAM LIBRARY CATALOG

FOR

PDP-8, FOCAL8, BASIC8

VOLUME II

DECEMBER 1973

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

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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

July 1974

DECUS Program Library Contacts

When users find it necessary to call the DECUS Program Library for information, it helps to have the name of a specific person with whom they can speak. For your information we have compiled the following list:

Accounting or Pricing Information - Karen King X2447

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I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

II. TEXT EDITING, TEXT MANIPULATION

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

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

V. DUPLICATION, VERIFICATION

8-600b	EXPIP (Extensions PIP)
8-606a	PIP11
8-663	REPROD/ Read, Punch and Verify Product

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

VII. UTILITY

8-600b	EXPIP (Extensions PIP)
8-602A&B	The PDP-8 Cookbook, Volume 1 & 2
8-606a	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

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

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

8-608	FUTIL - OS/8 File Utility
8-610	INVENT-8
8-611	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

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
8-660	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

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

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

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

XIV. PLOTTING

DECUS NO.	TITLE
8-629	Graphing Subroutines for 8K FORTRAN Programs
8-670	Basic Plotting Package for OS/8 FORTRAN IV

XV. DESK CALCULATOR, BUSINESS APPLICATION

8-607	CALCU1
8-610	INVENT-8

XVI. MAINTENANCE

8-608	FUTIL - OS/8 File Utility
8-614	Clock Calibration
8-624	DUMP and LOAD, TSS/8

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

DECUS NO.	TITLE
8-600b	EXPIP (Extensions PIP)
8-606a	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
8-660	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

July 1974

DECUS NO.	TITLE
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
8-658	Extended Double Precision Interpretive Package
8-659	VT05
8-660	STAT
8-661	LESQ, General Non-Linear Least Squares
8-662	UNDEFSYBLIST - Undefined Symbol List
8-663	REPROD - Read, Punch and Verify Product
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
8-667	LABLDP - A TSS/8 Tape Labeling Program
8-668	RAW - A Reverse Assembler of Windsor
8-669	BIOLSD - Antibiotic Assay Using Latin Square Design
8-670	Basic Plotting Package for OS/8 FORTRAN IV
8-671	Restoring Symbolprint
8-672	XCBL and XBIN Loader
8-673	Random Number Generators for Use With FORTRAN or SABR Programs
8-674	External - Or RC - Clock (AXØ8) Calibration
8-675	INDUMP - Input Dump
8-676	MOVE DELETE
8-677	STAR PIP
8-678	Routine to Expand and Modify the DEC Floating-Point Package
8-679	MAPPER
8-680	WLSHTR - A Fast Walsh Transform Subroutine for Real Valued Functions
8-681	CASE - Carleton Symbolic Editor
8-682	SCPSYS (Scope System)
8-683	BNLOAD, TSS/8 Binary Loader
8-684	Injection Patcher - IJPA
8-685	DPSQRT - Double Precision Square Root for PDP-8
8-686	Bowling League Results, Standings and Averages
8-687	GOLF
8-688	FOOTBALL
8-689	UFDSPY - A TSS/8 Line-Printer UFD Dump Program
8-690	RANDU
8-691	ACCK Timeshare Accounting System
8-692	OLEVX and OLEVAX, 4-Channel Averager and Analysis System
8-693	A Programmed Learning Course in Boolean Algebra
8-694	Teletype Line Printer Emulator Handler for OS/8
8-695	Real Time Display Processor for a KV8 Graphic System and KW8 Clock
8-696	DECTYP, One-Word Signed Decimal Print
8-697	DDTSS8, DECtape Dump for Time Shared System-8 (TSS/8 - Edusystem 50)
8-698	TEKLIB, A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
8-699	MPS External Event Common Routines

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	
8-600b	NC	$	$	$ NA	$ 5.	$ 17.	$	$	$	$	1 Src DTA
8-601	NC	1.		NA							
8-602A	NC		5.	NC							
8-602B	NC		5.	NC							
8-603	NC	1.	5.	NC							
8-604	NC	1.	5.	NA							
8-605	NC	1.	5.	NC							
8-606	NC		5.	NA							
8-607	NC	1.	5.	NC	5.	17.					Paper Tape OR DTA
8-608	NC			NA	5.	17.					Tape includes 8-608,
8-609	NC			NA	5.	17.					8-609 & FOCAL8-269
8-610	NC			NA	5.	17.					B/S DECtape
8-611	NC	1.	5.	NC							
8-612	NC	1.	5.	5.							
8-613	NC	1.	5.	NC							
8-614	NC	1.	5.	NC							
8-615	NC	1.	5.	NC							
8-616	NC	1.	5.	NC							
8-617	NC	1.	5.	5.							
8-618	NC		5.	NC							
8-619	NC		5.	NC							
8-620	NC			* Note							*Listings as quoted below
8-620A	NC	1.	5.	5.							
8-620B	NC	1.	5.	5.							
8-620C	NC	1.	5.	5.							
8-620D	NC	1.	5.	5.							
8-620E	NC	1.	5.	5.							
8-621	NC		5.	NA							
8-622	NC		5.	NC							

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N/A - Not Available

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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	
8-623	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-624	NC	1.	5.	NA							
8-625	NC		5.	NC							
8-626	NC	1.	5.	NC							
8-627	NC	1.		NC							
8-628	NC			5.	5.	17					1 B/S DTA
8-629a	NC	1.	5.	NC							
8-630	NC			NA							
8-630A	NC	1.		NA							
8-630B	NC	1.		NA							
8-630C	NC	1.		NA	5.	17.					1 B/S DTA
8-630D	NC			NA	5.	17.					1 B/S DTA
8-630E	NC			NA	5.	17.					1 B/S DTA
8-631	NC			NA	5.	17.					1 B/S DTA
8-632	NC			NA	5.	17.					1 B/S DTA
8-633	NC			NA	5.	17.					DTA with 8-632
8-634	NC			NA	5.	17.					DTA with 8-632
8-635	NC			NA	5.	17.					DTA with 8-632
8-636	NC	1.		NA							
8-637	NC		5.	NC							
8-638	NC		5.	NC							
8-639	NC	1.		5.							
8-640	NC	1.		5.							
8-641	NC		5.	NC							
8-642	NC	1.		NC							
8-643	NC		5.	NC							
8-644	NC	1.	5.	NC							
8-645	NC	1.		NC							
8-646	NC			NA	5.	17.	5.	15.			1 DTA OR 1 LINCtape

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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	
8-647	NC	$ 1.	$	$ NA	$	$	$	$	$	$	
8-648	NC	1.		NA							
8-649	NC		5.	NA							
8-650	NC		5.	NC							
8-651	NC			5.	5.	17.					1 B/S DTA inc. listing
8-652	NC	1.		NC							Test tapes included
8-653	NC	1.		NA							
8-654	NC	1.		NC							
8-655	NC	1.		NC							
8-656	NC	1.	15.	5.							
8-657A	NC	1.	5.	5.							
8-657B	NC	1.	5.	5.							
8-657C	NC	1.	5.	5.							
8-658	NC	1.	5.	NC							
8-659	NC			NC	5.	17.					1 DTA with 8-600b src
8-660	NC			NA	5.	17.					1 DTA src, doc, test data
8-661	NC			NA	5.	17.					1 DTA src,doc
8-662	NC	1.	5.	NC							
8-663	NC	1.	5.	NC							
8-664	NC		5.	NC							
8-665	NC		5.	NC							
8-666	NC		5.	NC							
8-667	NC	1.	5.	NC							
8-668	NC	1.	5.	5.							
8-669	NC	1.	5.	5.							
8-670	NC	1.	5.	NC							
8-671	NC			NC							
8-672	NC	1.	5.	NC							
8-673	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	
8-674	NC	$ 1.	$ 5.	$ NC	$	$	$	$	$	$	
8-675	NC	1.	5.	NC							
8-676	NC	1.	5.	NC							
8-677	NC			NA	5.	17.					1 DTA with 8-497
8-678	NC		5.	NC							
8-679	NC		5.	NC							
8-680	NC		5.	NA							
8-681	NC		5.	5.							
8-682	NC			NA	5.	17.					1 DTA obj, src
8-683	NC	1.	5.	NC							
8-684	NC	1.	5.	NA							
8-685	NC		5.	NC							
8-686	NC		5.	NA							
8-687	NC		5.	NA							
8-688	NC		5.	NA							
8-689	NC		5.	NC							
8-690	NC	1.	5.	NC							
8-691	NC			NA							DTA available from author
8-692	NC			NA	5.	17.					1 DTA obj, src
8-693	NC		5.	NA							
8-694	NC		5.	NC							
8-695	NC	1.	5.	NC							
8-696	NC		5.	NC							
8-697	NC	1.	5.	NC							
8-698	NC	1.	5.	NC			5.	15.			LTA for OS/12 users
8-699	NC		5.	NC							

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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^8 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 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)

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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 BASIC8 write-ups is available for a service charge of $10.00.

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 far 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: $1.00

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: $1.00

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: $1.00

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: $1.00

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: $1.00

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: $1.00

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: $1.00

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: $1.00

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: $1.00

IX MOLAR - Relationship between the moles and grams of a solute and the volume and molarity of the solution.
Paper Tape: $1.00

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: $1.00

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: $10.00; Listing: $15.00; DECtape: User Supplied - $5.00, DECUS Supplied - $17.00

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: $5.00

BASIC8-43
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: $5.00

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 $1.00; SIMEQ3 $1.00

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" $1.00; "B" $1.00

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: $1.00

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: $1.00

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: $1.00

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 $1.00; CSHHS BASIC-73 Object (Special format) $5.00

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 $1.00; ASCII $5.00

DECUS NO.	TITLE
FOCAL8-127	FOCAL- SLOT
FOCAL8-128	Probability (2P); From t ("Student") Distribution
FOCAL8-129	FOCAL Readable Punch
FOCAL8-130	FLHSTO
FOCAL8-131	ZAREA
FOCAL8-132	CIG-8 MARK II
FOCAL8-133	Withdrawn
FOCAL8-134	1-20 Counting Game
FOCAL8-135	MODV - Choice
FOCAL8-136a	FOCAL, Amity 73
FOCAL8-137	General Nth Order Regression
FOCAL8-138	WCXT: The Wilcoxon Matched-Pairs Signed-Ranks Test for Non Parametric Data
FOCAL8-139	Universal Input/Output for FOCAL
FOCAL8-140	Withdrawn
FOCAL8-141	Spanish Language FOCAL
FOCAL8-142	Successive Powers of a Matrix
FOCAL8-143	Repeated Matrix Multiplication
FOCAL8-144	FOCALJ -- DECtape FOCAL-69
FOCAL8-145	FOCAL for Disk and DECtape with Program Chaining
FOCAL8-146	Zeller's Congruence/Day of the Week
FOCAL8-147	Interaction Analysis
FOCAL8-148A	4K FOCL.S
FOCAL8-148B	8K FOCL.S
FOCAL8-149	Checkers
FOCAL8-150	FRAN8
FOCAL8-151	Fast Matrix Inversion for Real Numbers
FOCAL8-152	Surface Plate Auto-Collimation
FOCAL8-153	Two Overlays for FOCAL '69, FEXP-X-P and FLOG
FOCAL8-154	8K FOCAL Display
FOCAL8-155	FACTORS
FOCAL8-156	Blackjack for FOCAL
FOCAL8-157	Modifications to TSS/8 FOCAL
FOCAL8-158	Mileage Program
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 Qualities Division, Vol. 3
FOCAL8-160	Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test
FOCAL8-161	Wilmot Grading Program
FOCAL8-162	Transistor H-Parameter Conversions
FOCAL8-163	Erlang C Blocking Probability Programs
FOCAL8-164	Four New Functions for FOCAL 5/69
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
FOCAL8-168	One-Armed Bandit - PDP-8 Style
FOCAL8-169	FOCAL Version of the GE Basic Artillery Game
FOCAL8-170	Saint Peter's College Statistical Package
FOCAL8-171	Minnesota Sociology Statistics Programs
FOCAL8-172	XPON
FOCAL8-173	APOLLO II
FOCAL8-174	SYNDIV 5
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
FOCAL8-177	PS/8 FOCAL, 1971
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
FOCAL8-180	FOCAL-SORT
FOCAL8-181	Filter Design
FOCAL8-182	First Order Differential Equation: Initial Value Problem
FOCAL8-183	DARTS
FOCAL8-184	Manpower
FOCAL8-185	LIFE
FOCAL8-186	SUMER (FRENCH)
FOCAL8-187	Display FOCAL
FOCAL8-188	Generating Random Numbers with FOCAL
FOCAL8-189	8K Overlay Patch for FOCAL5/69 (DECUS NO. FOCAL8-52a)
FOCAL8-190	Patch to Add LABEL Feature to FOCAL 5/69 (DECUS NO. FOCAL8-52a)
FOCAL8-191	Reverse Overlay for FOCAL, 1969
FOCAL8-192	Echo Change for FOCAL, 1969
FOCAL8-193	Anova , 2-way, Unsymmetrical
FOCAL8-194	Rectangular to Polar Coordination (German)

DECUS NO.	TITLE
FOCAL8-195	All Purpose Graphing Program
FOCAL8-196	Fisher's Exact Test
FOCAL8-197	Self-Teaching Program for FOCAL
FOCAL8-198	Michaelis-Menten Kinetics
FOCAL8-199	Stock Market Game
FOCAL8-200	SIMEQR - 20 Simultaneous Equations in 8K FOCAL
FOCAL8-201	FOCAL Patch for Function FP, Mod 4B
FOCAL8-202	Code Generator
FOCAL8-203	Graph Sketching
FOCAL8-204	Acid-Base Equilibria
FOCAL8-205	Random Walk/Array
FOCAL8-206	FOCAL Generates Binary Patches
FOCAL8-207	EAI/ASCII Converter and 'SLO-SYN' NC Program and Tape Generator
FOCAL8-208	A Normally Distributed Random Number Generator in FOCAL
FOCAL8-209	GRFIT, A Simple Least Squares Routine
FOCAL8-210	CHAIN and FCOM
FOCAL8-211	WEST-KY Four-User FOCAL
FOCAL8-212	Automated Terminal Usage Accounting for Four-User FOCAL
FOCAL8-213	FOCAL Random Number Generator
FOCAL8-214	FDSK, An Overlay for FOCAL to Read Data - Or Program - Files from the PS/8 Systems Device
FOCAL8-215	FOCAL 1969 Octyl Loader
FOCAL8-216	FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL
FOCAL8-217	Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions
FOCAL8-218	FOCAL Overlay CHAIN
FOCAL8-219	Keyboard Controlled High Speed Punch Routine for FOCAL 1969
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
FOCAL8-223	FOCLX, 1972
FOCAL8-224	SPASTIC - A System for Programming Angles, Scaler and Timer by Internal Counting
FOCAL8-225	Loan Amortization Schedule
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
FOCAL8-230	CALCOMP Plotter FNEW PLOTX
FOCAL8-231	Extended Precision Sine and Cosine for 4-word FOCAL
FOCAL8-232	Roots by Inverse Interpolation
FOCAL8-233	A FOCAL-Correlation Program for the LAB-8 System 1. Auto-and Cross-Correlation Program 2. Auto-Correlation Program
FOCAL8-234	Action Indicator Calculator
FOCAL8-235	MPS Radiation Pattern Program
FOCAL8-236	Polynomial Curve Fitting (Streamlined Programs)
FOCAL8-237	Bond Computations
FOCAL8-238	Millikan Oil Drop Experiment
FOCAL8-239	DIV - Program for Division
FOCAL8-240	Science Fiction Quiz
FOCAL8-241	Satellite Orbital Parameters
FOCAL8-242	Solution of Linear Equation Systems with Symmetrically Matrix
FOCAL8-243	Analysis of Variance for One- Two- and Three-Treatment Designs for a PDP-8
FOCAL8-244	HANGMAN IV
FOCAL8-245	Executive and Utility Routines for FOCLX, 1972
FOCAL8-246	Undefeatable FOCAL TIC-TAC-TOE
FOCAL8-247	FNEWS Overlay to Use High Speed Punch with FOCAL Program
FOCAL8-248	FOCTXT - Text Input-Output Patch to FOCAL-1969
FOCAL8-249	Payroll Listings and Totals
FOCAL8-250	Six Curves - GMS037
FOCAL8-251	"WORD" - Character Generation Using FOCAL's FDIS Function
FOCAL8-252	12K Overlay for FOCAL
FOCAL8-253	Solution to Any Equation Involving One Variable
FOCAL8-254	Patch to Allow Computed Line Numbers in FOCAL, 1969
FOCAL8-255	Repeating Decimal
FOCAL8-256	OPTION $
FOCAL8-257	LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM
FOCAL8-258	Hearing Loss Simulation

DECUS NO.	TITLE
FOCAL8-259	High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69
FOCAL8-260	Arithmetic and Geometric Progressions
FOCAL8-261	Chi Square Utility Package, CHISQR
FOCAL8-262	Protein Binding: PROBON 1 - Fraction Bound, PROBON 2 - Total Drug
FOCAL8-263	ROOTS, A Polynomial Root Finder
FOCAL8-264	MEMORY, A Children's Game
FOCAL8-265	LISTAL
FOCAL8-266	STATPACK, An Interactive Statistical Package
FOCAL8-267	BLACKJACK for FOCAL 1969
FOCAL8-268	FX Function for Random Access Files
FOCAL8-269	4K FOCAL '69 Speed-Up Patches
FOCAL8-270	MONOPOLY
FOCAL8-271	Modifications of FOCL/F for Data Acquisition and Control
FOCAL8-272	Punched Paper Tape Generator With Randomization Using FOCAL (1969)
FOCAL8-273	The Phi Phenomenon
FOCAL8-274	FOCAL 5/69 Input Buffer Patch
FOCAL8-275	Teletype Histogram and Statistical Analysis of Data Set Entered and Corrected by Teletype
FOCAL8-276	The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data
FOCAL8-277	Newton Binomial
FOCAL8-278	A FOCAL-8 Program for Fitting the Equation $C=A(1-e^{-Kt})$
FOCAL8-279	MUSECL MUSI6
FOCAL8-280	Improved Multiply Loop for FOCAL
FOCAL8-281	French Language FOCAL, 5/69
FOCAL8-282	CONVRT - Dollars to Deutsch Marks and Deutsch Marks to Dollars
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
FOCAL8-287	CC-FOCAL-Q
FOCAL8-288	FSPACE - Space Command for FOCAL '69
FOCAL8-289	TTY PUN - FOCAL Patch to Punch Data on Paper Tape in Format Compatible With the TTY Intercom Terminal to CDC6000 Computer Series
FOCAL8-290	Kolmogorov-Smirnov Test for Normality

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

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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	
FOCAL8-30	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							

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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	
FOCAL8-116	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							

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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	
FOCAL8-147	NC	$	$ 1.	$ NA	$	$	$	$	$	$	
FOCAL8-148A	NC	1.		NA							4K
FOCAL8-148B	NC	1.		NA							8K
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							

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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.		NA	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							

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DEC 7-(369)1112A-R1172

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.

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. FOCAL8-124 (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. FOCAL8-270 (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 INTER-COM 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

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I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

II. TEXT EDITING, TEXT MANIPULATION

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

IV. BINARY LOADING, BINARY PUNCHING

DECUS NO.	TITLE
12-17	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
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12-14	MUL-2REG
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C
12-34	STAP-12
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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
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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

VII. UTILITY

DECUS NO.	TITLE
12-2	PDP-12 Utility and Data Reduction Programs
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12-13	RDPEC: PEC Synchronous Tape Read Program
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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
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12-107	AVUPTO8, AVUPTO8S
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12-111a	ADFILE
12-112	IDXRDD
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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
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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

VIII. DISPLAY

DECUS NO.	TITLE
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12-21	Modified MAGSPY
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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
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12-161	BIGCHARS
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IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

DECUS NO.	TITLE
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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 Analysis Package
12-144	ANECDOTE - Advanced NeuroElectric Computer Data Operational Tape (Export)
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIPIØ: PDP-10 DECtape to LINCtape Converter

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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 Compufer Data Operational Tape (Export)
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12-147	*BLIPFUN - Computation of Bandlimited Periodic Functions and their Hilbert Transforms from Samples
12-148	STATIS12, A Statistical Package for the PDP-12

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

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12-4	IRDA
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12-35	Bioelectric Signal Sorter (JULIA)
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12-55	FFAESIM
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12-69	An On-Line FOCAL-12 Program for Auto-Analyzers
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12-73	8-Point Quadratic Smooth with FPP-12
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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 Analysis Package
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

XII. HARDWARE CONTROL

DECUS NO.	TITLE
12-29	LINC-10
12-75	FORTRAN Subroutines for the PDP-12
12-114	FOCAL-PL

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

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

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

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

PDP-12 NUMERICAL INDEX

DECUS NO.	TITLE
12-1	EEG Data Collection (BNI Series)
12-2	PDP-12 Utility and Data Reduction Programs
12-3	Obsolete
12-4	IRDA
12-5	SERCHPRO
12-6	ANDIP - Analog Digital Interchange Program
12-7	DBLFLT - Double Float Mathematical Routines
12-8	Teletype Conversion Routines
12-9	SLOWCREF
12-10	FOCAL Library (LINCtape FOCAL for the PDP-12)
12-11	ODTAPE (Octal Debugging for PDP-12 LINCtapes)
12-12	8TO12 File Converter
12-13	RDPEC: PEC Synchronous Tape Read Program
12-14	MUL-2REG
12-15	HISTO12
12-16	MODCLK
12-17	DIALRFØ8
12-18	"FAILSAFE"
12-19	Withdrawn
12-20	FORMATXT
12-21	Modified MAGSPY
12-22	PLOTFFT
12-23	CFFT
12-24	Overlays to FOCAL-12
12-25	Three Subroutines for QANDA - FRACUS, SCRMBL, QANDA-C
12-26	See L-124A
12-27	See L-124B
12-28	See L-124C
12-29	LINC-10
12-30	TDUMP
12-31	DCON-1Ø
12-32	COMPAR12
12-33	KWANDA
12-34	STAP-12
12-35	Bioelectric Signal Sorter (JULIA)
12-36	Hangman for PDP-12
12-37	ODCAD (Octal to Decimal Conversion and Display)
12-38A	Histogram and One-Factor Analysis of Variance
12-38B	Histogram and Two-Factor Analysis of Variance
12-39	QUANAT 1
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-41	BLOOPD - Blood Pressure Display Program
12-42	CALCO 12
12-43	PLOT3D
12-44	AVERDT
12-45	FOCALP-FOCALPE
12-46	STRINGS
12-47	PIP-16ØØ
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
12-51	MAGSPYD
12-52	Student Test Analysis
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments
12-54	QUIP - Quick Assembler for the PDP-12
12-55	FFAESIM
12-56	QANDA+ - Modified QANDA Subroutine
12-57	SPY+ - Modified MAGSPY
12-58	FIFOCON
12-59	FOCPLOT
12-60	SUMER (French)
12-61	Generating Random Numbers with FOCAL
12-62	RUFUS
12-63	OLFFT1 and FETCHFFT
12-64	Walsh Transform Subroutines, PWALSH and LWALSH
12-65	PISH - Poststimulus Time and Interspike - Interval Histogram
12-66	ADDINDX (LAP6-DIAL-MS Index Manipulator)
12-67	PPG FOCAL

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DECUS NO.	TITLE
12-68	A PDP-8 Floating Point Software Package Simulator Using a FPP-12 Floating Point Processor
12-69	An On-Line FOCAL-12 Program for Auto-Analyzers
12-70	COMPLT
12-71	Snoopy Display Program
12-72	Four-Point Smoothing with FPP-12
12-73	8-Point Quadratic Smooth with FPP-12
12-74	*REGRES - Multiple Linear Regression
12-75	FORTRAN Subroutines for the PDP-12
12-76	TAPELOOK; CORELOOK; SEARCH
12-77	PAL12A Assembler
12-78	PUBPLOT
12-79	Modified ADTAPE
12-80	FOCAL - RT
12-81	VR12 SCOPE HANDLER FOR OS/8
12-82	LAP6-DIAL TO PS/8 SOURCE FILE CONVERTER
12-83	$ANOVARM - ONE WAY ANALYSIS OF VARIANCE FOR REPEATED MEASURES DESIGN
12-84	AVERAGER
12-85	APOLLO 12
12-86	ORGAN-AA and ORGAN+BA
12-87	ONDISK-OFFDISK
12-88	OCTALFPP
12-89	BUTFLTR
12-90	REPRSNT
12-91	OCTPUNCH
12-92	PDP8TO12
12-93	TRANS
12-94	DATAN
12-95	PDP-12 PS/8 Utility Programs
12-96 A&B	SCOPE and CNGMWA
12-97	An Off-Line FOCAL-12 Program for Auto-Analyzers by TWX
12-98	HERALD - Analog-Digital Average and Standard Error Program
12-99	A Set of Spectral Programs
12-100	Withdrawn
12-101	OS/8 SKED
12-102	A Manual for the PDP-12 Operator
12-103	$HAPPY

DECUS NO.	TITLE
12-104	CORDATFP
12-105	DATAFILE and DFUPDATE
12-106	$PLOT
12-107	AVUPTO8, AVUPTO8S
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
12-111a	ADFILE
12-112	IDXRDD
12-113	IDXWT
12-114	FOCAL-PL
12-115	PLOT 3D, Pseudo 3-Dimensional Perspective Display for the PDP-12
12-116	FPP-12/FOCAL-12 Reduction of Auto Analyzer Data for Pharmaceuticals
12-117	TAPEDIT; A PDP-12 LINCTAPE EDITOR
12-118	Average Transient Advanced Programs
12-119	Neurone Spike Train Analysis Programs
12-120a	DUAL
12-121	Arrhythmia Detection and Categorization
12-122	PDP-12 User's Monitor Command
12-123a	OS/8 VR12 Handler
12-124	FR, FIDS and FADC for PDP-12 Input/Output
12-125	Waveform Analysis
12-126	WAVEFORM: Evoked Potential Analysis
12-127	Withdrawn
12-128	GEP: A Generalized Experimental Package
12-129	OS/12S Scope Monitor Operating System
12-130	COMPARE - Fast LINCtape Compare
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
12-138	ISEL
12-139	BURST Analysis Package
12-140	NAEP - Nerve Action and Evoked Potentials

DECUS NO.	TITLE
12-141	$CORREL - Intercorrelation Program for 50 Variables
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
12-146	$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
12-149	XPIP8: PDP-12 DECtape PIP
12-150	XPIP1Ø: PDP-10 DECtape to LINCtape Converter
12-151	"PSYCHO", A PDP-12 Programming System for Control of Titration Schedules, Behavioral Data Acquisition and Summary in Animal Psychophysics
12-152	LOAD31K, A Loader for DIAL-MS and 32K of Core
12-153a	DUAL32, DUAL-28K Assembler
12-154a	CREF32
12-155	MARK12XØ
12-156	MUSIC12
12-157	PLOTVS, Device Independent Graphics
12-158	FASTCOPY, A Fast LINCtape Copier for 4K PDP-12's
12-159	PLAYBOY
12-160	CCTGEN - Carriage Control Tape Generator
12-161	BIGCHARS
12-162	COREDIT
12-163	AD74 - High Speed Analog to Digital Conversion Program

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	
12-1	NC	$	$	$ NA	$	$	$ 5.	$15.	$	$	On 1 LINCtape
12-2	NC			NA			5.	15.			On 1 LINCtape
12-4	NC			NA			5.	15.			On 1 LINCtape
12-5	NC			NC			5.	15.			On 1 LINCtape
12-6	NC			5.			5.	15.			On 1 LINCtape
12-7	NC			NA			5.	15.			On 1 LINCtape
12-8	NC			NA			5.	15.			With 12-7
12-9	NC			5.			5.	15.			On 1 LINCtape
12-10	NC			NC			5.	15.			On 1 LINCtape
12-11	NC			NC			5.	15.			On 1 LINCtape
12-12	NC			NA			5.	15.			On 1 LINCtape
12-13	NC			NC			5.	15.			On 1 LINCtape
12-14	NC			NC			5.	15.			On 1 LINCtape
12-15	NC			NC			5.	15.			On 1 LINCtape
12-16	NC	1.	5.	NC							
12-17	NC	1.	5.	NC							
12-18	NC	1.	5.	NC							
12-20	NC	1.	5.	NA							
12-21	NC	1.		NA							
12-22	NC			5.			5.	15.			On 1 LINCtape
12-23	NC			5.			5.	15.			With 12-22
12-24	NC			NC			5.	15.			On 1 LINCtape
12-25	NC			NA			5.	15.			On 1 LINCtape
12-29	NA		5.	NA							
12-30	NC			5.			5.	15.			On 1 LINCtape
12-31	NC			5.			5.	15.			On 1 LINCtape
12-32	NC			5.			5.	15.			On 1 LINCtape
12-33	NC			5.			5.	15.			On 1 LINCtape
12-34	NC			NA			20.	60.			On 4 LINCtapes

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	
12-35	NC	$	$	$ NA	$	$	$ 5.	$15.	$	$	On 1 LINCtape
12-36	NC			NA			5.	15.			On 1 LINCtape
12-37	NC			NA			5.	15.			With 12-36
12-38A	NC			NC			5.	15.			On 1 LINCtape
12-38B	NC			NC			5.	15.			With 12-38A
12-39	NC			NA			5.	15.			On 1 LINCtape
12-40	NC			NA			5.	15.			On 1 LINCtape
12-41	NC	1.	5.	NA							
12-42	NC			5.			5.	15.			On 1 LINCtape
12-43	NC			NA			5.	15.			On 1 LINCtape
12-44	NC			NA			5.	15.			With 12-43
12-45	NC			NA			5.	15.			On 1 LINCtape
12-46	NC			NA			5.	15.			Tape contains 12-46,
12-47	NC			NA			5.	15.			47, 110, 120a, 145
12-48	NC			5.			5.	15.			On 1 LINCtape
12-49	NC			NC			5.	15.			On 1 LINCtape
12-50	NA			NA			5.	15.			On 1 LINCtape
12-51	NC			5.			5.	15.			On 1 LINCtape
12-52	NC		5.	NA							
12-53	NC		5.	NA							
12-54	NC			NA			5.	15.			On 1 LINCtape
12-55	NC	1.	5.	NC							
12-56	NC			5.			5.	15.			On 1 LINCtape
12-57	NC			5.			5.	15.			With 12-56
12-58	NC			NC							
12-59	NC			NC			5.	15.			On 1 LINCtape
12-60	NC			NC			5.	15.			On 1 LINCtape
12-61	NC			NC							
12-62	NC			NA			5.	15.			On 1 LINCtape

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	
12-63	NC	$	$	$ NA	$	$	$ 5.	$ 15.	$	$	On 1 LINCtape
12-64	NC		5.	NC							
12-65	NC			NA			5.	15.			On 1 LINCtape
12-66	NC			NA			5.	15.			On 1 LINCtape
12-67	NC			NC			5.	15.			On 1 LINCtape
12-68	NC			5.			5.	15.			On 1 LINCtape
12-69	NC			NC			5.	15.			On 1 LINCtape
12-70	NC			NA	5.	17.	5.	15.			DECtape for PDP-8 users
12-71	NC	1.		NA							
12-72	NC			NC			5.	15.			On 1 LINCtape
12-73	NC			5.			5.	15.			On 1 LINCtape
12-74	NC			NC							
12-75	NC	1.	5.	NC							
12-76	NC			NA			5.	15.			On 1 LINCtape
12-77	NC			5.			5.	15.			On 1 LINCtape
12-78	NC			5.			5.	15.			On 1 LINCtape
12-79	NC	1.	5.	NC							
12-80	NC			NA			5.	15.			On 1 LINCtape
12-81	NC			NA			5.	15.			On 1 LINCtape
12-82	NC			NA			5.	15.			With 12-81
12-83	NC		5.	NC							
12-84	NC			NA			5.	15.			On 1 LINCtape
12-85	NC		5.	NC							
12-86	NC	1.	5.	NC							
12-87	NC			NA			5.	15.			On 1 LINCtape
12-88	NC		5.	NC							
12-89	NC		5.	NA							
12-90	NC		5.	NA							
12-91	NC		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

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	
12-91	NC	$	$ 5.	$ NA	$	$	$	$	$	$	
12-92	NC		5.	NA							
12-93	NC	1.		NC							
12-94	NC			NA							
12-95	NC			NA			5.	15.			On 1 LINCtape
12-96A&B	NC			NA			5.	15.			On 1 LINCtape
12-97	NC			NC							
12-98	NC			5.			5.	15.			On 1 LINCtape B/S
12-99	NC			NA			5.	15.			On 1 LINCtape B/S
12-101	NC			NA			5.	15.			On 1 LINCtape obj/src
12-102	NC			NA							
12-103	NC		1.	NC							
12-104	NC			NA			5.	15.			On 1 LINCtpae B/S
12-105	NC			NA			5.	15.			On 1 LINCtape -Sys src
12-106	NC			NA			5.	15.			On 1 LINCtape B/S
12-107	NC			NA			5.	15.			On 1 LINCtape B/S
12-108	NC	1.	5.	NA							
12-109A,B,C	NC			NC			5.	15.			On 1 LINCtape
12-110	NC			NA			5.	15.			Tape with 12-46,47, 120a,145
12-111 a	NC			NA			5.	15.			On 1 LINCtape
12-112	NC			NC			5.	15.			On 1 LINCtape
12-113	NC			NC			5.	15.			
12-114	NC			NA			5.	15.			On 1 LINCtape B/S
12-115	NC			NA			5.	15.			On 1 LINCtape B/S
12-116	NC			5.			5.	15.			On 1 LINCtape B/S
12-117	NC			NC			5.	15.			On 1 LINCtape B/S
12-118	NC			NA			5.	15.			Same LINCtape - Also
12-119	NC			NA			5.	15.			contains files for 12-105

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	
12-120a	NC	$	$	$ 5.	$	$	$5.	$ 15.	$	$	Tape with 12-46,47,110, 145
12-121	NC			5.			5.	15.			On 1 LINCtape B/S
12-122	NC			NC			5.	15.			On 1 LINCtape
12-123a	NC	1.	5.	NC							
12-124	NC		5.	NC							
12-125	NC			NC			5.	15.			On 1 LINCtape B/S
12-126	NC			5.			5.	15.			On 1 LINCtape B/S
12-128	NC		5.	NA							
12-129	NC			NA			5.	15.			On 1 LINCtape B/S
12-130	NC			NC			5.	15.			On 1 LINCtape src
12-131	NC			NA			5.	15.			On 1 LINCtape obj/src
12-132	NC			NA			5.	15.			On 1 LINCtape B/S
12-133	NC			NA			5.	15.			On 1 LINCtape obj/src
12-134	NC			NA			5.	15.			On tape with 12-133
12-135	NC			NA			5.	15.			On tape with 12-133
12-136	NC			NA			5.	15.			On tape with 12-133
12-137	NC			NA			5.	15.			On tape with 12-133
12-138	NC			NA			5.	15.			On tape with 12-133
12-139	NC			NA			5.	15.			On 1 LINCtape obj/src
12-140	NC			NA			5.	15.			On 1 LINCtape obj/src
12-141	NC		5.	NC			5.	15.			Order ASCII or LINCtape obj
12-142	NC			NC							
12-143	NC			NA			5.	15.			On 1 LINCtape obj/src
12-144	NC			NA			5.	15.			On 1 LINCtape obj/src
12-145a	NC			5.			5.	15.			Tape with 12-46,47,110 120a
12-146	NC		5.	NC							
12-147	NC		5.	NC							
12-148	NC			5.			5.	15.			On 1 LINCtape obj
12-149	NC	1.		NA							Src available from author

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	
12-150	NC	$1.	$	$ NA	$	$	$	$	$	$	Src available from author
12-151	NC			5.			5.	15.			On 1 LINCtape obj/src
12-152	NC			NC			5.	15.			1 LTA obj,src
12-153a	NC			NA			5.	15.			Same tape - Includes
12-154a	NA			NA			5.	15.			12-46, 47, 110, 120b,
12-155	NA			NA			5.	15.			153, 154, 145
12-156	NC			NC			5.	15.			1 LTA obj, src
12-157	NC			NC	5.	17.	5.	15.			LTA,OS/12; DTA,OS/8
12-158	NC			NC			5.	15.			1 LTA obj, src
12-159	NC			NC			5.	15.			1 LTA obj, src
12-160	NC			NC			5.	15.			1 LTA obj, src
12-161	NC			NC			5.	15.			1 LTA obj, src
12-162	NC			NC			5.	15.			1 LTA obj, src
12-163	NC			NC			5.	15.			1 LTA obj, src

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

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

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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.

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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.

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 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

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

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, cor 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