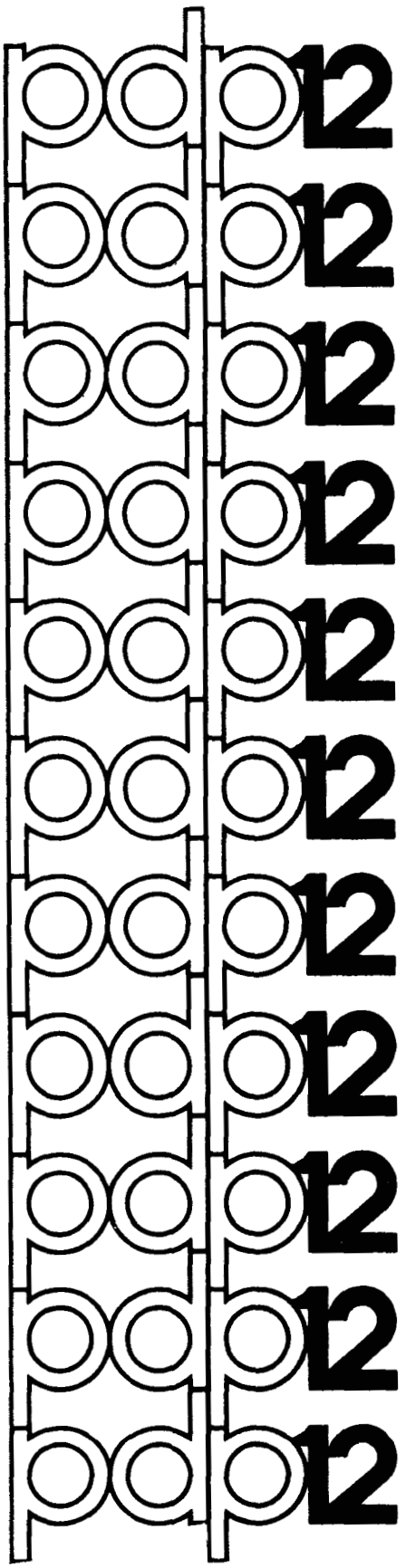
digital



SOFTWARE PACKAGE AND SERVICES

IMPORTANT – PLEASE READ

DEC-12-BW1G-D

January, 1971

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For additional copies order DEC-12-BW1G-D from Program Library, Digital Equipment Corporation, 146 Main Street, Maynard, Massachusetts 01754 Price $1.00

Dear Customer:

The following paragraphs offer suggestions for using your PDP-12 Computer System; an overview of the current Software Package (Appendix A) and Software Services (Appendix B) is also provided in this document.

Immediately upon receipt of your PDP-12 computer, you should (1) read this document and the LAP6-DIAL[1] manual and (2) use the PIP program to make copies of the LINCtapes which you plan to use.

If you did not order a PDP-12 DEC Supplies Kit (Appendix C) with your PDP-12, you may order the kit now. Individual items, such as LINCtapes or Teletype paper, are also available. Included is a DEC Supplies price list. If duplicate copies of part, or all, of the Software Package are required, Appendix D contains the PDP-12 Program Library Price List.

We recommend a careful reading of Appendix E, which describes the details of this software release.

Please be certain to keep all the maintenance programs (write-ups and tapes) near the computer to facilitate service by your DEC Service Representative.

[1] LAP6-DIAL is commonly refered to as DIAL.

APPENDIX A

PDP-12 SOFTWARE PACKAGE

The basic PDP-12 Software Package consists of eight LINCtapes, approximately 30 paper tapes, and four looseleaf notebooks containing program documentation. The components of the package are inventoried in the PDP-12 Software List (which includes the PDP-8/I Software List). It is a good idea to verify the Software Package with the Check List. Any discrepancies should be reported to the Program Library.

From a functional viewpoint, all PDP-12 Software falls into one of three broad categories: "user" software, "demo" software and "maintenance" software. User software is software which is useful in applying the computer to specific technical problems. It includes programs for specific applications, systems programs, and utility programs. Demo software consists primarily of the DEMO-12 Monitor and programs taken from the LINC-8 Program Library (the programs have been modified to run under the Monitor). Some are intended for demonstration/amusement only; some are useful applications programs, though unsupported by DEC. Maintenance software consists of "hardware diagnostics" - programs designed to test the operation of the PDP-12 hardware. Maintenance software is used primarily by maintenance personnel and is not normally of interest to people doing applications programming.

Three of the six LINCtapes supplied in the PDP-12 Software Package contain user programs (SE2E, SE3C, SE4B); one contains a demo program (UXZC); and two contain maintenance programs (D7AE and D8GC). All are LAP6-DIAL, Version 2 tapes. Each program has an accompanying publication which describes its operation in detail. In addition, each maintenance program has a source file associated with it, containing information pertaining to that particular program; each user program is defined in Appendix E. The tapes containing user

and demo programs are 1600 blocks long. The DIAL programs in general recognize only the first 1000_8 blocks. The extra blocks are utilized for storage of sources which will be used infrequently. To manipulate files beyond block 777_8, use PIP to copy them to another tape or disk; the files will be appropriately assigned for DIAL on the new tape or disk.

Training

A two-week PDP-12 Programming Course is given periodically at DEC's main plant in Maynard, Massachusetts, U.S.A., Palo Alto, California, U.S.A., Reading, Berkshire, United Kingdom, Cologne, Germany and Paris, France. This course is an excellent way to learn about both basic PDP-12 Programming and PDP-12 Software Package. "Hands-on" training, using the PDP-12's in the Digital Training Department's fully-equipped Computer Lab, is a particularly valuable feature of the course. A PDP-12 Programming Course enrollment is included with each PDP-12 purchased.

Software Specialists

Many Digital local offices have resident Software Support Specialists. A Software Specialist is a professional computer programmer whose job it is to help his customer make optimum use of DEC's programming. He should be able to answer most software related questions or obtain the needed information. When no Software Specialist is available, please contact the Sales Engineer at the nearest Digital Office.

Program Library

New and revised programs and manuals, Software Performance Report forms, and cumulative Software Manual Updates are available from the Program Library. Please include the code number and a brief description of the program or manual requested. Orders may be forwarded by mail with a purchase order number or check to your local Digital office or to the Program Library.

Software Information Service

Announcements of new and revised software, as well as programming notes, software problems, and documentation corrections are published monthly in Digital Software News for the PDP-8 & PDP-12. Articles in this newsletter contain information to update the cumulative Software Performance Summary for the PDP8 & PDP-12. PDP-12 users benefit from the software development effort for the PDP-8 computer because of the PDP-12's ability to execute PDP-8 programs. If you are interested in receiving Digital Software News please notify your Software Specialist or Software Information Service. Additional copies of the Software Performance Summary may requested without cost from the Program Library.

DECUS

The Digital Equipment Computer User's Society (DECUS) offers a number of valuable services to PDP-12 users, including a user's library and a periodical newsletter, DECUSCOPE. Enclosed is a pamphlet describing the activities of the Society and application information.

KIT CONTENTS

QUANTITY	DESCRIPTION
2	Rolls of oiled paper tape
1	Box of ASR 33 Teletype paper
500	LINCtape labels, assorted colors
1	Special LINCtape Storage Rack (18-09544)
20	Rolls of LINCtape
5	Spare Teletype ribbons

Revised: June 26, 1969

Price: $200.00

The family of 8 Price List (DEC-08-BRZE-D), which is included in the PDP-12 Software Package, supplies the price list for the PDP-8 subset of the Software Package.

PDP-8/I Basic Software Package (documents + tapes)		$75.00
LINCtapes		
LAP6-DIAL User Programs		
DEC-12-SE2E-UO[1]		30.00
DEC-12-SE3C-UO		30.00
DEC-12-SE4B-UO		30.00
DEMO12 Programs		
DEC-12-UXZC-UO		30.00
Maintenance Programs		
MAINDEC-12-D7AE-UO		30.00
MAINDEC-12-D8GC-UO		30.00
LAP6-DIAL Sources (2 tapes, listings and program descriptions)		
Version 2	DEC-12-SEYA-UO	100.00
Mass Storage	DEC-12-SEZB-UO	100.00
User Programs		
PDP-12 Users Handbook	DEC-12-SRZA-D	5.00
LAP6-DIAL Manual	DEC-12-SE2D-D	2.00
DIAL-MS Update	DEC-12-SE2D-DN	1.00
QANDA	DEC-12-FISA-D	1.00
CONVERT	DEC-12-ESYB-D	1.00
MAGSPY	DEC-12-UZSA-D	1.00
L8SIM	DEC-12-SI1B-D	1.00
MARK12	DEC-12-YITA-D	1.00
CATACAL	DEC-12-UW1A-D	1.00
ADTAPE/ADCON	DEC-12-UW2A-D	2.00
SIGAVG	DEC-12-UZ1A-D	1.00

[1] "UO"=LINCtape; "D"=Document; "PB"=Paper Tape Binary; "PA"=Paper Tape ASCII.

SINPRE	DEC-12-UW4A-D	2.00
TISA	DEC-12-UW3A-D	2.00
NMRSIM	DEC-12-UW5A-D	2.00
NMRSIME	DEC-12-UW7A-PB	2.00
FRED	DEC-12-FZFA-D	1.00
MILDRED	DEC-12-FZDA-D	1.00
PATCH	DEC-12-YU2A-D	1.00
PRTC12-F	DEC-12-YIYA-D	1.00
CREF12	DEC-12-FRZB-D	1.00
DISPLAY	DEC-12-FLSB-D	1.00
FOCAL-12	DEC-12-AJAA-D	3.00
LIFE	DEC-12-UW8A-D	2.00

Demo Programs

User's Guide	DEC-12-UXZB-D	2.00
Monitor Technical Description	DEC-12-MRZA-D	1.00

Maintenance Program

Instruction Test Part 1	MAINDEC-12-D0BA-D	2.00
	D0BA-PB	2.50
Part 2	MAINDEC-12-D0AB-D	2.00
	D0AB-PB	2.50
Part 3	MAINDEC-12-D0CA-D	2.00
	D0CA-PB	2.50
JMPSELF	MAINDEC-12-D1BA-D	2.00
	D1BA-PB	2.00
PDP-12 Address Test	MAINDEC-12-D1CA-D	2.00
	D1CA-PB	2.00
PDP-12 Checkerboard	MAINDEC-12-D1DA-D	2.00
	D1DA-PB	2.00
Float 1's and 0's Through Memory	MAINDEC-12-D1EA-D	2.00
	D1EA-PB	2.00
TC12I	MAINDEC-12-D3AE-D	2.00
	D3AE-PB	2.00
TC12II	MAINDEC-12-D3GA-D	2.00
	D3GA-PB	2.50
VR12 Display	MAINDEC-12-D6BB-B	2.00
	D6BB-PB	2.50

A to D Test	MAINDEC-12-D6CC-D	$2.00
	D6CC-PB	2.00
DR12 Relay Register Test	MAINDEC-12-D8AB-D	2.00
	D8AB-PB	2.00
Tape Data Test	MAINDEC-12-D3FB-D	2.00
	D3FB-PB	2.00
DC04TST	MAINDEC-12-D8DA-D	2.00
	D8DA-PB	2.00
DB12 Test	MAINDEC-12-D9BA-D	2.00
	D9BA-PB	2.00
PDP-12 Operating Procedures	MAINDEC-12-D9CA-D	2.00
	D9CA-PB	2.00
KW12A Clock Test	MAINDEC-12-D8CC-D	2.00
	D8CC-PB	2.00
Extended Memory Control Test	MAINDEC-12-D1AC-D	2.00
	D1AC-PB	2.00
KW12 B-C Simple Clock	MAINDEC-12-D8EB-D	2.00
	D8EB-PB	2.00
TC12-F Option	MAINDEC-12-D3EB-D	2.00
	D3EB-PB	2.00
PDP-12 MAGtape Data Exerciser (LINCtape)	MAINDEC-12-D3DA-D	2.00
	D3DA-PB	2.00
CB12	MAINDEC-12-D1DA-D	2.00
	D1DA-PB	2.00

DEC-12-SE2E-UO

NAME	SOURCE BN	SOURCE BLKS	BINARY BN	BINARY BLKS
PIP			247	21
MARK12	1512	50	470	7
FOCAL-12			477	26
FOCAL4K	776	1	226	21
$THRUFØ*	1562	12	525	4
CATACAL			531	21
MAGSPY			216	10
QANDA	660	17	213	3
MILDRED	677	35	210	3
SIGAVG1			200	10
LIFE			552	21
GENASYS			164	5
DIAL-MS1			573	20
DIAL-MS2			144	20
DIAL-MS3			613	6
DIAL-MS4			124	20
TISA			621	20
DISPLAY	107	13	122	2
ADTAPE			71	16
ADCON			57	12
NMRSIM			37	20
CREF12			171	7
L8SIM			34	3
FFTD			641	17
SIGAVG2			24	10
FRED	734	40		
SIGAVG4			12	12
SINPRE	1450	36	Ø	12
FFTC-1	1000	50		
FFTC-2	1050	33		
MILQAN	1103	54		
SIN256	1157	4		
LIFE BØ1	1163	37		
LIFE B4	1222	43		
LIFE B5	1265	22		
LIFE B6	1307	47		
SIGAVG	1356	65		
CNTRL2	1443	3		
CNTRL4	1506	4		
SE2E	777	1		

*This program is loaded via FOCAL-12, not DIAL-MS. Refer to the FOCAL-12 Manual, DEC-12-AJAA-D.

	SOURCE		BINARY	
NAME	BN	BLKS	BN	BLKS
PIP			247	21
CONVERT	746	27	470	5
FORCOM	14	1	475	20
FORSYS	13	1	231	16
BINLOAD	11	1	515	3
PATCH	15	24	520	4
PRTC12-F	1145	65	524	12
Y01B-PB			222	7
Y02B-PB			213	7
Y03B-PB			536	10
Y04B-PB			202	11
25F-EAE1			546	7
25F-EAE2			555	7
25F-EAE3			171	11
25F-EAE4			564	11
FMAA-PA	167	2		
FMBA-PA	164	3		
FMCB-PA	160	4		
FMDA-PA	575	10		
FMEA-PA	151	7		
FMFC-PA	605	10		
FMGB-PA	146	3		
FMHA-PB			137	7
FMIA-PA	615	1		
FMJA-PA	616	3		
FMKA-PA	135	2		
10UASCII	621	1		
11UASCII	622	4		
14UASCII	131	4		
15UASCII	626	5		
18UASCII	125	4		
19UASCII	122	3		
21UASCII	633	5		
22UASCII	117	3		
23UASCII	640	5		
24UASCII	111	6		
25UASCII	645	10		
28UASCII	102	7		
29UASCII	655	12		
21-U-BIN			77	3
NMRSIME			57	20
CATACALE			667	21
CAT1E			50	7
CAT1			41	7
MAGSPY	710	36		
TIP1	775	73		
TIP2	1070	55		
ADTAPE	1232	71		
ADCON	1323	46		
NMR2	1371	40		
NMR3	1431	52		
SE3C	12	1		
L8SIM	1503	14		

	SOURCE		BINARY	
NAME	BN	BLKS	BN	BLKS
PIP			247	21
CAT2	147	61		
CAT3	470	65		
SE4B	146	1		

DEC-12-UXZC-UO

NAME	SOURCE BN	SOURCE BLKS	BINARY BN	BINARY BLKS
LOADER.			0	1
SEG01-3.			1	3
SEG11-4.			4	4
INITLIZ.			10	1
GREETIN.			11	1
BALLOON.			12	5
SEG04-4.			17	1
DMOINDX.			20	2
Q AND A.			22	2
.DA-DTST	24	2	165	3
.DDATA12	26	4	37	6
.DMAGSPY	32	2	153	10
.DFRQANA	35	2	72	11
.DDIAL	45	1	163	2
.EFREQ12	46	2	170	3
.EWAVES	50	2	173	3
.EB.BALL	52	1	176	3
.EBASMEM	53	1	201	5
.FSOLACE	54	1	206	2
.FMUSIC	55	1	210	6
.FKALEID	56	1	216	2
.FDRAW12	57	2	220	3
.FECHASK	61	2	223	3
.FSPCWAR	63	3	226	16
.TDAYCOM	66	1	244	4
.TSTPWCH	67	2	250	6
.TCLOCK	71	1	256	5
SCRATCH.	103	50		
GREETING	530	1	776	1
INDEXSRC	263	5		
OMAGSPY	540	37		
DRAW12	470	6		
KALIED	476	1		
H-DIAL	477	1		
H-FRQANA	500	2		
EX.PROG.	526	1	520	2
AD DEMO	527	1	614	3
BINLOAD			535	3
H-FREQ12	502	2		
H-B.BALL	504	1		
H-ECHASK	505	2		
H-DAYCOM	507	1		
CAROLS			617	11
H-STPWCH	510	1		
LOADER	635	2	637	2
INITLIZE	641	17	660	3
SEG0	663	34	717	6
SEG1	725	36	763	6
BALLOON			771	5
H-DRAW12	511	2		
H-SOLACE	513	1		
H-CLOCK	514	1		
H-BASMEM	515	1		
H-MAGSPY	516	2		
H-A-DTST	522	1		
DATA12	777	17		
ECHASK	531	3		
H-DATA12	577	3		
KW12SUBC	602	5		
STPWCH	1016	25		
FRQANA	1043	31		
UXZC	523	1		
04-06-70	524	2		

DEC-12-D7AE-UO (Basic diagnostics)

NAME	SOURCE BN	SOURCE BLKS	BINARY BN	BINARY BLKS
PIP	604	1	251	17
MARK12	603	1	470	7
RIMLDR	605	1	477	3
BINLDR	606	1	502	3
CBL	607	1	505	3
CBH	104	1	245	4
ADDRSLO	612	1	510	3
ADDRSHI	103	1	241	4
ADDRS12	611	1	513	2
RANISZ	101	1	515	5
RANJMP	102	1	235	4
JMPJMS	100	1	522	4
JMPSELF	610	1	233	2
MEMDATA	613	1	231	2
INST1	614	1	526	13
INST2	77	1	217	12
INST2A	726	1	203	14
INST2B	602	1	541	6
TC12DAEX	200	1	547	10
CPTST1	712	1	564	4
CPTST2	713	1	146	21
CPTST3	725	1	131	15
TTY1	714	1	570	7
TTY2	715	1	615	13
TC12F	2	1	121	10
EXTMC	717	1	113	6
EXTAT	720	1	644	10
EXTCB	721	1	654	11
EXTMC12	1	1	62	15
TC12 I	202	1	41	21
TC12 II	177	1	727	15
TAPEDATA	201	1	107	4
ADTST	761	1	34	5
RELAYTST	762	1	706	4
DISPTST	763	1	30	4
KW12A	772	1	6	21
ONOFF	765	1	722	3
CB12	773	1	3	3

NAME	SOURCE BN	SOURCE BLKS	BINARY BN	BINARY BLKS
PIP	42	1	251	17
MARK12	41	1	470	7
RIMLDR	37	1	477	3
BINLDR	40	1	502	3
DB12	250	1	505	5
DC04	247	1	515	11
LP08	111	2	145	16
PECITRE	555	1	534	7
PECITIT	245	1	207	11
PECITDRT	246	1	543	12
PECITDT	512	1	201	6
DC02F	526	2	163	11
DC02E	531	1	571	6
EAE3A	532	1	130	15
EAE3B	533	1	615	14
DP12A	577	1	114	14
PWRFAIL	631	1	600	3
KW12BC	637	1	632	5
CALCOMP	113	1	640	10
HSRDPUN	244	1	603	12
DF32DD	243	1	220	21
DF32DL	242	1	556	13
RF08DD	241	1	60	13
RF08MD	513	1	174	5
LINEPNTR	514	1	54	4
CARDREAD	43	1	703	6

This release of LAP6-DIAL provides implementation of RK8 disks and LP08 line printer, chaining of programs, and several new applications programs. To date (January 15, 1971) there are no known errors on the tapes. A brief description of the user programs follow (note that some require additional hardware - e.g., KW12A clock or 8K of memory); see the individual descriptions for particulars.

ADTAPE/ADCON

ADTAPE is a data acquisition program that allows the user to simultaneously sample from 1 to 16 A/D channels at sampling rates up to 1000 points/second and up to a maximum time of 40 seconds/point, display the output of any two channels on the scope, and output all results to LINCtape in real time. ADTAPE has a setup mode that allows the user to define a wide variety of sampling schemes via either the keyboard/scope or LINCtape. The program ADCON is utilized subsequent to ADTAPE and allows the user to stratify ADTAPE LINCtape output for a given channel on contiguous tape blocks.

BINLOAD

The Binary Loader (DEC-08-LBAA-PB) is also included on the tape for those using binary paper tapes. It is self starting and loads into field Ø. If one wishes to use it in field 1, read in the first block, the header block, and change:

Word 1	from 62Ø2	to	6212
Word 357	from 7777	to	Ø
Word 377	from Ø	to	7777

and rewrite the block.

CATACAL

CATACAL is a box car averager and data manipulation program that can acquire data from an external instrument at rates that range from .25m to 35 seconds per point. CATACAL has the capability of reading and writing on LINCtape; it can output one or two spectra to either the scope or an X-Y recorder. It can also differentiate, integrate, strip, and compare spectra and display the results on the scope. CATACALE has the same capabilities as CATACAL, but uses EAE. Note that reassembly of either program requires DIAL-MS. CAT2 and CAT3 are the sources for the program; CAT1 and CAT1E are the floating-point overlays.

CONVERT

CONVERT translates a LAP6 or LAP6-3L source program on LINCtape to source usable by DIAL.

CREF12

CREF12 allows the DIAL-MS user to generate cross-reference listings of all user defined symbols with the line numbers at which the symbol was defined and used.

DIAL

LAP6-DIAL, commonly referred to as DIAL, is supplied in two versions: DIAL-V2, for non-disk systems and DIAL-MS for 8K disk systems. DIAL is the PDP-12 operating system and includes assembling, editing, and PIP capabilities.

DISPLAY

DISPLAY enables a data display facility for those routines which do not require complex display processing or cannot sacrifice the core for such a display. The routine displays any contiguous section of core via a moving window, with a cursor and octal readout of cursor positions to facilitate operator interaction.

FFTD

Fast Fourier transforms and inverse Fast Fourier transforms can be performed on 4 to 1024 real or complex points using the FFTD (Fast Fourier Transform and Display) program. The real and imaginary parts of the input or output data and the magnitude and scale factor of the output data can be displayed on the scope via a moving window. Transformed data can be stored on DIAL or data LINCtapes or disks.

FOCAL4K

FOCAL4K (DEC-08-AJAE-PB) is included on the tape for convenience of loading. FOCAL is an on-line, conversational, interpretive language designed to solve numerical problems using short, easy-to-learn, imperative English statements.

FOCAL-12

FOCAL-12 is an extension of FOCAL designed to optimize ease of use of the PDP-12 and its standard peripherals, including the display scope, LINCtape, disk, A/D channels, sense switches, and KW12 clock. DIAL files are utilized for program and/or data storage and retrieval.

FORCOM/FORSYS

The 4K FORTRAN System is included on the tape: FORCOM, the compiler (DEC-08-AFC1-PB) and FORSYS, the operating system (DEC-08-AFC3-PB).

FRED/MILDRED

The File Replacement, Entry and Deletion subroutine processes the DIAL tape indices for the user, freeing him from writing the clerical function of maintaining the file entries. MILDRED processes tape and/or disk indices using the DIAL-MS I/O subroutines.

GENASYS

The tapes distributed by the Program Library are set up to operate with LAP6-DIAL V2. Those users with 8K of core memory who wish to use the disk version of LAP6-DIAL may convert to DIAL-MS using GENASYS.

LIFE

Acquired data is characterized and stored for subsequent matching and retrieval by the program LIFE, Library File Entry. A library of spectra data is created on LINCtape or disk by specifying features of the data via a cursor and moving window on the display scope. Unknowns then can be compared with the library for identification. LIFE is particularly useful with data obtained by the PDP-12 data acquisition programs such as TISA and ADTAPE.

L8SIM

The LINC-8 Simulator Trap Processor handles Teletype input and output for LINC-8 and classic LINC programs when they are run on the PDP-12. It must be loaded into the PDP-12 core memory with any LINC-8 or classic LINC program which uses the keyboard or any classic LINC program which uses the Teleprinter in order for that program to run on the PDP-12.

MAGSPY

The MAGSPY program provides a moving window for scanning data stored on digital magnetic tape. The data is displayed on the scope and can be scanned at a rate determined by a potentiometer setting. The data can be interpreted either as a binary point plot or as packed ASCII characters.

MARK12

The MARK12 program is used to format tapes to be used with the PDP-12. Three format options are available including a 1600_8 block format, and, by using the subroutines within MARK12, the user can generate a tape of arbitrary format.

NMRSIM

NMRSIM is a program that allows the user to calculate theoretical spectra of a wide variety of compounds. The user inputs the appropriate parameters from the keyboard, such as spin, chemical shifts, and coupling constants. Calculated line spectra are displayed on the scope. NMRSIM can output spectra to LINCtape and also can read, merge and display a series of spectra from LINCtape which effectively simulates large spin systems or mixtures of compounds. NMRSIME performs the same functions as NMRSIM, but also uses EAE. Note that reassembly of both programs requires DIAL-MS. NMR2 and NMR3 are the sources for the program, CAT1 and CATE are the floating point overlays.

PATCH

The PATCH program will modify any location in any TBLK on tape unit 1. Its primary function is to provide a method for making small patches to LINCtape binaries. For example, PATCH can be used to modify load and go arguments in a LAP6-DIAL binary header TBLK.

PIP

The Peripheral Interchange Program provides a flexible means of transferring data among peripheral devices such as LINCtape, Teletype, high-speed paper-tape reader/punch, line printer, disk and card reader. Symbolic and binary files, as well as absolute data, are processed in response to scope-directed operator requests.

PRTC12-F

The program PRTC12-F operates the TC12-F tape option and allows the user to read and write in the forward direction DECtapes that have been formatted on the PDP-8, PDP-9, PDP-10 or PDP-15 computers.

QANDA

QANDA is a subroutine which allows a user to display textual information on the CRT display, ask questions of the viewer, allow editing of the input, and receive answers.

SIGAVG/SINPRE

SIGAVG is a multisweep signal averager that allows the user to extract a signal from a signal/noise external environment, and display it on the scope. SIGAVG can sample at rates that range from 55-4Ø95 microseconds per point per instrument, can support a maximum of five instruments, can take up to 4Ø96 sweeps, and can output averaged results to LINCtape. SINPRE converts the output of SIGAVG (two word) to the commonly used one word format. SIGAVG1, SIGAVG2, and SIGAVG4 are the binary versions described in the Signal Averager document; CNTRL2 and CNTRL4 are the parameter tables described in the same document.

TISA

TISA can acquire asynchronous or synchronous data simultaneously from up to five instruments at rates that do not exceed 1/2 millisecond/point and store data on LINCtape. Data is displayed on the scope via a moving window and cursor with X-Y decimal read out. TISA has a setup mode that allows the user to define a wide variety of experiments via either the keyboard/scope or LINCtape and supports up to 32K of core. Data can be acquired from instruments that are interfaced via shaft encoders or potentiometers or both. With the power to call any LAP6-DIAL program, TISA is able to interact with all PDP-12 software.

The following matrix summarizes the required and supported PDP-12 options for each program.

	Additional Hardware and Software			
Program	DIAL-MS	8K Core Mem.	KW12 Clock	Disk
ADTAPE/ADCON			x	
BINLOAD				
CATACAL		x	x	
CONVERT				
CREF12	x	x		*
DIAL-MS		x		*
DISPLAY		*		
FFTD	x	x		*
FOCAL4K				
FOCAL-12	x	x	*	*
FORCOM/FORSYS				
FRED	x	*		
MILDRED	x	*		x
GENASYS	x	x		*
LIFE	x	x		*
L8SIM				
MAGSPY				
MARK12				
NMRSIM		x	x	
PATCH				
PIP		x	*	
PRTC12-F				
QANDA				
SIGAVG		*	x	
SINPRE				
TISA		*	x	

x = required

* = optional