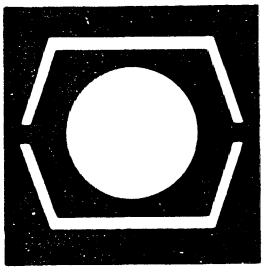

DECUS PROGRAM LIBRARY CATALOG

FOR

PDP-7 AND 7/9, PDP-9, PDP-15 AND PDP-11

UPDATE -- FEBRUARY 1972

OCTOBER 1971
DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS 01754 TEL. 8975111 TWX 710 347-0212

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

PDP-10, PDP-12, PDP-15 and LINC orders and information - Barbara Kowalczyk X2524

PDP-8 Library orders and information - Helen Tucker X2524

PDP-11, FOCAL and BASIC orders and information - Stacia Taylor X2524

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

DECUS NO. 7-66

V5A Advanced Software System for the PDP-7

J. W. Cox, F. W. Keller, D. A. Brody
Submitted by: Roger Goldman, Digital Equipment Corporation, Maynard, Massachusetts

This is a modified version of the 9/15 bank mode V5A operating system to run on the PDP-7. The system looks and runs almost identically to the bank mode system on the PDP-9. All of the new features are available such as multi-core operation, CHAIN/EXECUTE, F4S, the new MACRO, PATCH, SGEN and DDT. Also, batch processing from either cards or tape works.

The system is really more of a kludge than a retrofit and therefore has several restrictions not found in the PDP-9.

Minimum Hardware:	8K PDP-7, 2 DECtape units, EAE, PDP-9 Mods, No API
Other Programs Needed:	Runs all V5A System Programs except F41 and MACRO I
Storage Requirement:	Usable core is 204_{10} locations less than PDP-7 V4B

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
7/9-4c	X	X	X	X				
7/9-8a	X	X	X	X				
7-9a	X	X						
7-13	X							
7/9-25	X	X						
7-33	X		X	X				
7-42	X	X	X	XX				
7-43	X	X	X	X				
7-44	X	X						
7-45	X	X	X	XX				
7-47	X		X	X				
7/9-51	X	X	X	X				
7-52	X				X			
7/9-53	X		X					
7/9-54	X		X	X				
7/9-55	X	X	X	XX				
7/9-56	X	X	X	XX				
7-57	X		X	X				
7-58	X	X	X	X				
7-59	X		X	X				
7-60	X	X			X (3)			
7-61	X	X	X		X (2)			
7-62	X	X	X	X				
7-63	X	X	X	X				
7-64	X	X	X	XX				
7/9-65	X	X	X	XX				
7-66	X		X		X(2)			

* X - Listing with write-up XX - Listing available at a handling charge

PDP-7 AND 7/9 NUMERICAL INDEX

DECUS NO. 9-73A & B

DECIN AND DECOUT

David Hale, Aston University, Birmingham, England

DECIN is an external function subroutine (the result comes back to the main program via AC). It allows the entry on the TTY keyboard of a signed decimal integar terminated by a CR. This is converted into a 2's complement signed binary integer within the normal integer number range (± 131071). Input is in IOPS ASCII, thus RUBOUT and ↑ U can be used. If a number is outside number range IOPS 66 will be output, if an illegal character (e.g. non-digit) is included in input IOPS 67 will be output. Integer input can be restarted with ↑ P after an IOPS error.

DECOUT is an external function subroutine (the integer is transferred to the routine via the AC). It will print on the teletype, on .DAT 4, a signed decimal integer. Leading zeros are replaced with spaces and the result is right justified. Only 2's complement single precision integers can be used.

Minimum Hardware: 8K PDP-9
Source Language: MACRO 9

DECUS NO. 9-74

FOCAL Conic-Plotting Routines

A. B. Durell, The Ontario Institute for Studies in Education, Toronto, Canada

This package of programs uses the FOCAL plotting feature to display conics on a CRT. Subroutines allow conics to be translated and/or rotated. The package is intended as an aid for studying conic sections.

Minimum Hardware: 8K PDP-9, Type 34H Interface with appropriate CRT or equivalent PDP-8 components
Source Language: FOCAL

DECUS NO. 9-75A & B

DRAW and DRAWDH

David Hale, Aston University, Birmingham, England

This is an external subroutine which allows the FORTRAN or MACRO user to draw straight line approximations between successive points on the PDP 9 display. The original version needed EAE and did not use Z modulation. DRAW uses the normal .DA argument transfer call. DRAWDH does not use .DA. The two routines differ only in calling method and speed - DRAWDH is slightly faster.

Minimum Hardware: PDP-9, 34H Display
Other Programs Needed: Integer Arithmetic
Storage Requirement: 255_8
Source Language: MACRO-9

NOTE OF INTEREST

Another program of interest to PDP-9/15 users would be DECUS NO. 8-460, TT89. The program writes ASCII files from PDP-8 devices onto a PDP-9 DECtape. The PDP-9 DECtape directory can also be listed or zeroed, and files can be deleted.

The program is available as write-up and 1 binary and 8 ASCII paper tapes.

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
9-70	X	X	X	X				
9-71	X	X	X					
9-72	X	X	X	X				
9-73A	X	X	X	X				
9-73B	X	X	X	X				
9-74	X			X				
9-75A	X	X	X	XX				
9-75B	X	X	X	XX				

* X - Listing with write-up XX - Listing available at a handling charge

PDP-9 NUMERICAL INDEX

DECUS NO.	TITLE
9-1	Obsolete
9-2	3D DRAW for 339 Display
9-3	Double Precision Integer Package
9-4	INTEGE: Integer Arithmetic with EAE
9-5	DECtape File-Reading Basic Assembler
9-6	Scatter-Gather Magnetic Tape Routines
9-7	Magnetic Tape Duplication Program
9-8	TTJ. - 6-Bit Teletype I/O Handler
9-9	MAC89 (Stand Alone Version)
9-10	TIME
9-11	ML/I-9 Macro Processor
9-12	Obsolete
9-13	Plotter and Display Output Routines for the PDP-9 ADVANCED Software System
9-14	PROCON-9
9-15	Obsolete
9-16	Real-Time Clock Handler - Four Level Queue
9-17	Drum Monitor for RM09 Drum
9-18	Obsolete (See DECUS NO. 7/9-65)
9-19	PIPHA, CALPIT - Particle Identification System
9-20	Conversational Mode Software for Control Systems Analysis
9-21	CLOSS
9-22	DTCOPY
9-23	KALSD9
9-24	Matrix Package
9-25	RCA Bootstrap
9-26	DTF. (DTG.): DECtape Handlers for FORTRAN Compiling
9-27	PRGLDR: Program Loader for RCA Bootstrap
9-28	PACKER: A Text Handling Subroutine for PDP-9 ADVANCED Software System
9-29	LPB.
9-30	OCTIP: Octal Integer Print Subroutine (Basic Software System)
9-31	ASCII
9-32	UTIP - University of Tennessee Interchange Program
9-33	PTBIN
9-34	DOCUME
9-35	READ, WRITE, PRINT
9-36	CARDTO
9-37	DTDUMP
9-38	SEUDO
9-39	FLEX: FORTRAN for Laboratory Experiments
9-40	One's Complement Automatic Operations and MACRO Language for PDP-9 Computer
9-41	A Floating Point Arithmetic Package for a PDP-9 Computer (FP9)
9-42	MANGLE: Multiple Alpha-Numeric Group Locating Editor
9-43a	PDP-9 SNOBOL (Version 2A)
9-44	Obsolete (See DECUS NO. 7-64)
9-45	Asynchronous FORTRAN I/O for Binary Devices
9-46	Real and Multi-Precision Math Package
9-47	PAGLST: Paginated Listing Program
9-48	CHAR: Character Manipulation Subroutines (5/7 ASCII)
9-49	LST10
9-50	5/7 ASCII Pack-Unpack (Using EAE)
9-51 A, B&C	SHUFFL, SCRAM, FRAND
9-52 A&B	CHAR and WRITE
9-53a	Obsolete (See DECUS NO. 15-2
9-54	Data Collection System for the Sagamore Hill Radio Company
9-55	PDP-9 Basic Arithmetic Operation
9-56	CNTRLP and DMAND
9-57	Fast Fourier Transform Routines (University of Arizona)
9-58	Analysis of the PDP-9 Computer Software Capability
9-59	CDTDTT - Device Handler for One Pass Compilation/Assembly
9-60	Obsolete (See DECUS NO. 15-2)
9-61	FIND
9-62	PDP-9 Routine to Read or Write PDP-8 DECtapes
9-63	Location Independent Debug (LID)

DECUS NO. 11-15

PDP-11 Datapoint Editor, JPEDIT

Dr. James E. Parker, Central Intelligence Agency, Washington, D. C.

This PDP-11 Datapoint Editor is equally adapted for creating programs or plain text. It has the usual features of append, insert, delete, change, punch, read tape, and make a hard copy. The program operates on the whole text, which resides in core, and two pointers are used to control the operations. Commands are available to move the pointers by lines or by characters. A search command is available which will locate an arbitrary string, after which one or both of the pointers may be positioned at either end of the string. The program is readily adaptable to other hardware configurations including communications lines to other computers. The interface to the datapoint terminal is a DC-11-AC.

Minimum Hardware: 8K PDP-11, Datapoint 3300 Terminal or substitute, Reader/Punch, Line Printer
Source Language: PAL-11

DECUS NO. 11-16

FFT11C - A Fast Fourier Transform Subroutine For Complex Data

Robert Day, Digital Equipment Corporation, Maynard, Massachusetts

FFT11C is a subroutine written for the PDP-11/20 with EAE for performing a forward or inverse Fast Fourier Transform of N complex data points where N is a power of 2 in the range ($8 \leq N \leq 1024$). A sample size of 1024 points is transformed in 1.6 seconds. About 3K of core storage is required. It is designed to run within the user's main program.

Minimum Hardware: 4K PDP-11/20 with KE11-A EAE unit
Storage Requirement: 2986 words
Source Language: PAL-11A

DECUS NO. 11-17

TTY Code to Octal

John E. Bowdle, Goodyear Atomic Corporation, Piketon, Ohio

This is a convenient program for use in verification of the teletype keyboard operation. The operator may type any key and the program will return the three digit ASCII code in octal as presented in the appendix of most DEC handbooks.

Minimum Hardware: PDP-11/20; Teletype with standard register locations
Other Programs Needed: Absolute Binary Loader
Source Language: PAL-11A

DECUS NO. 11-18

PDUMP - DOS Based Register/Core Dump

J. Eric Pollack, University of Washington, Department of Oceanography, Seattle, Washington

This subroutine is included in the user's core load and referenced by a JSR instruction to dump to KB: or LP: the contents of the registers at the time of call and core (in octal) between specified limits. In this version, no optimizing is attempted to avoid printing multiple zero lines.

Minimum Hardware: Minimal Configuration supporting DOS.
Source Language: PAL-11

DECUS NO. 11-19

Core Load to MAINDEC Tape/MAINDEC Tape

Gary D. Schaal, Digital Equipment Corporation, Phoenix, Arizona

This is a Core to DECtape dump so that at later dates the second halt can be used for faster loading of MAINDECs, systems programs, games, etc.

Minimum Hardware: PDP-11 (15 or 20) with 4K of core, Teletype and 1 TU56/TC11
Source Language: Machine Language

DECUS NO. 11-20

Trace for PDP-11 Floating Point Package

William R. Lamb, Transaction Technology, Cambridge, Massachusetts

The trace routine permits the user of floating point operations the option of displaying the results of calls to any subroutines in the floating point package. As each call is made via the modified trap handler, the trace will print (1) the program counter at the point of the call, (2) the destination address (in octal) for the result of the operation and (3) the result itself. The proper conversion routine is automatically selected: E - format for all floating point results, Integer format if fixed point. The trap handler replaces module 9 of the Floating Point Package.

Minimum Hardware: PDP-11/20 with 4K memory, ASR-33 TTY
Storage Requirement: 446 additional locations for the trap handler
Source Language: PAL-11

DECUS NO. 11-29

COPYTAPE

William H. Talbot, Johns Hopkins University School of Medicine, Baltimore, Maryland

COPYTAPE efficiently duplicates formatted binary tapes. It recognizes the Absolute Loader's transfer blocks and gives the user the option of deleting them. Thus it can be used to link absolute binary subroutines to a main program on a single tape.

Minimum Hardware:	4K PDP-11, TTY, HSR/P
Other Programs Needed:	IOX
Source Language:	PAL-11A

DECUS NO. 11-30

ENCODE/DECODE for PDP-11 FORTRAN IV

J. Eric Pollack, Department of Oceanography, University of Washington, Seattle, Washington

These routines implement the ENCODE/DECODE format transfer statement for FORTRAN programs.

Minimum Hardware:	Sufficient to support FORTRAN
Other Programs Needed:	FORTRAN OTS support subroutines
Storage Requirement:	254_8 bytes
Restrictions:	These routines were written with OTS version 2 and will not work with version 1
Source Language:	PAL-11

DECUS NO. 11-31

Binary Tape Interpreter/Address Scanner

John E. Bowdle, Goodyear Atomic Corporation, Piketon, Ohio

This program reads PDP-11 binary tapes in the optical tape reader and prints an octal image of the tape on the teletype. The block checksum is verified. An alternate version determines only the addresses used. The user may use ODT to insert the few patches needed for the address only version.

Minimum Hardware:	4K PDP-11/20, TTY and optical tape reader with standard addresses
Other Programs Needed:	Binary loader
Storage Requirement:	4-36, 600-3230, Auto-start, RA=600
Source Language:	PAL-11A

DECUS NO. 11-32

MONUP - DOS Monitor Update Program

J. Eric Pollack, Department of Oceanography, University of Washington, Seattle, Washington

MONUP performs a function very similar to the distributed system program MODS. MONUP merges updated load modules with a file consisting of a series of concatenated load modules. MONUP is used to update the MONLIB.SYS file for input to SYSLOD. MONUP does not transfer the boot and SYSLOD as does MODS and is not limited to paper tape input.

Minimum Hardware:	RF11 and DECtape, 8K
Source Language:	PAL

DECUS NO. 11-33

EDITX

J. Eric Pollack, Department of Oceanography, University of Washington, Seattle, Washington

EDITX is a modification to the distributed Editor for the PDP-11 (DEC-11-EEDA V002A). It incorporates a new command (EN) to permit redefinition of primary input and primary output files at any time during edit.

DECUS NO. 11-34

PALEDIT

Thierry Monnerot, IMAG Institut Polytech, Grenoble, France

This program allows direct assembly of text stored in the Editor buffer and allows easy transfer between Editor and Assembler, facilitating re-editing and re-assembly.

Minimum Hardware:	8K PDP-11, ASR33 (PC11 optional)
Other Programs Needed:	Standard Loaders
Restrictions:	4K Editor/Assembler features only
Source Language:	PAL-11

DECUS NO. 11-35

COMBINE

Thierry Monnerot, IMAG Institut Polytech, Grenoble, France

The program combines multiple binary tapes into a single tape, deleting all END Blocks except the last.

Minimum Hardware:	4K PDP-11, ASR33 (PC11 optional)
Other Programs Needed:	Standard loaders
Storage Requirement:	2000-3470 plus IOX
Source Language:	PAL-11

DECUS NO. 11-36

Parity Subroutine

Ray Jones, Digital Equipment Co., Ltd., Reading, England

This is a 10 instruction parity checking subroutine with a simple driving program.

Minimum Hardware:	4K PDP-11, ASR33
Storage Requirement:	10 locations
Source Language:	PAL-11

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
11-1	X		X	X				
11-2	X		X	X				
11-3	X	X		X				
11-4	X	X	X					
11-5	X		X	X				
11-8	X			X				
11-9	X		X	X				
11-10			X					
11-11	X				X			
11-12	X		X					
11-13	X	X	X					
11-14	X	X	X	X				
11-15	X	X	X	XX				
11-16	X	X	X	XX				
11-17	X	X	X	X				
11-18	X				X			
11-19	X	X		X				
11-20	X	X	X					
11-21	X				X			
11-22	X				X			
11-23	X				X			
11-24	X	X						
11-25	X				X			
11-26	X	X	X	XX				
11-27	X	X	X					
11-28	X	X	X					
11-29	X	X	X					
11-30	X				X			
11-31	X	X	X	XX				
11-32	X				X			
11-33	X				X			

* X - Listing with write-up XX - Listing available at a handling charge

PDP-11 NUMERICAL INDEX

DECUS NO.	TITLE
11-1	Recursive Unsigned Radix Print
11-2	Single Precision Unsigned Multiply/Divide
11-3	Dice Game for the PDP-11
11-4	PDP-11 Binary Loader
11-5	Blackjack for FOCAL-11
11-6	LINK-11S } Withdrawn - Available from
11-7	PAL-11S } DEC Program Library
11-8	Dump in Bootstrap Format Binary
11-9	Slow Matrix Inversion For Real Numbers
11-10	PDP-11 BASIC Demonstration Package
11-11	PDP-11 DECtape Copy Routine
11-12	AC Circuit Analysis Program
11-13	ADUMP
11-14	Paper Tape Duplicator (High Speed Reader to TTY)
11-15	PDP-11 Datapoint Editor - JPEDIT
11-16	FFT11C - A Fast Fourier Transform Subroutine For Complex Data
11-17	TTY Code to Octal
11-18	PDUMP - DOS Based Register/Core Dump Subroutine
11-19	Core Load to MAINDEC Tape/MAINDEC Tape
11-20	Trace for PDP-11 Floating Point Package
11-21	C1OFB/DOS Based Overlay File Builder/ Editor (Version 3)
11-22	DFPEEK/DOS Based Disk Inspect/Patch Routine
11-23	BINFED/DOS Based Binary Module List/ Patch Program
11-24	FOCAL-11 (Preliminary Version)
11-25	File Compatibility Package PDP-9/15 DECtape to PDP-11 DECtape
11-26	DSKSAV/DOS Disk SAVE/RESTORE
11-27	BIOF: BASIC Input/Output Function
11-28	Extended ODT-11X
11-29	COPYTAPE
11-30	ENCODE/DECODE for PDP-11 FORTRAN IV
11-31	Binary Tape Interpreter/Address Scanner
11-32	MONUP - DOS Monitor Update Program
11-33	EDITX
11-34	PALEDIT
11-35	COMBINE
11-36	Parity Subroutine
11-37	Conway's Game 'LIFE'
11-38	PAL-11A (12K) Card Reader Assembler
11-39	"SUPER DUPER" (Fast PDP-11 DECtape Duplication Routine

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

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
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 PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
12-33	X			XX		X		
12-34	X					X (4)		
12-35	X					X		
12-36	X					X		
12-37	X					X		
12-38A	X			X		X		
12-38B	X			X		X		
12-39	X					X		
12-40	X					X		
12-41	X	X	X					
12-42	X			XX		X		
12-43	X					X		
12-44	X					X		
12-45	X					X		
12-46	X					X		
12-47	X					X		
12-48	X			XX		X		
12-49	X			XX		X		
12-50						X		
12-51	X			XX		X		
12-52	X		X					
12-53	X		X					
12-54	X			XX		X		
12-55	X	X	X	X				
12-56	X			XX		X		
12-57	X			XX		X		
12-58	X			X				
12-59	X			XX		X		

* X - Listing with write-up XX - Listing available at a handling charge

PDP-12 NUMERICAL INDEX

DECUS NO. 15-1

LTA.

R. C. Davies, Idaho Nuclear Corporation, Idaho Falls, Idaho

This handler operates devices connected to the LTØ9 or LT19. Paper tape punches and Teletypes have been implemented. The comments will help the user make changes for his particular system. The handler debreaks from all interrupts and processes them at level 4 (API) or mainstream (non-API) to allow other interrupts to occur during processing.

Minimum Hardware:	PDP-9 or PDP-15; LTØ9 or LT19
Restrictions:	Conditional assembly (PI=Ø for non-API); must use MACRO assembler
Miscellaneous:	There are 6 EAE instructions which could easily be changed for non-EAE
Source Language:	MACRO

DECUS NO. 15-2

Ultra Fast Fourier Transform, UFFT1V

E. DeBoer and H. R. DeJongh, Wilhelmina Hospital, Amsterdam, The Netherlands

This is a subroutine to perform a Fast Fourier Transform of a given series of N complex numbers. The subroutine is compatible with FORTRAN IV programs. Input and output appear in the form of pairs of "real" numbers. The actual computation is performed in integer arithmetic. Various provisions have been taken to insure maximum accuracy.

Minimum Hardware:	PDP-9 or PDP-15 with EAE
Storage Requirement:	1135_8 locations (program); 1200_8 locations (sine table)
Restrictions:	N, the number of complex data to be transformed, must be an integer power of 2. N can maximally be 512 (this can easily be modified).
Source Language:	MACRO-9

DECUS NO. 15-3

A Software Package for the DEC PDP-15/20/30 and the HP5610A Analog to Digital Converter

M. H. Birley, Aeronomy Laboratory, University of Illinois, Urbana, Illinois

This package contains two programs basic to data acquisition using the HP 5610A analog to digital converter as the high speed, real time input device. The first is an I/O handler for the PDP-15/20, Advanced Monitor Software System and offers the more general application of the device in a uniplexer, external encode command, single user system configuration. The second program uses a dedicated I/O service routine to control data acquisition from the HP 5610A in the foreground of a PDP-15/30 Background/Foreground Monitor System in 26_{10} word blocks, to pack the data into sets and output it in dump mode to DECtape.

Minimum Hardware:	16K, Teletype, HP5610A Analog to Digital Converter and DEC special interface CSS-MS-E-70-2, API, Multicycle databreak
Other Programs Needed:	Program to issue MACRO handler calls
Source Language:	MACRO-15

DECUS NO. 15-4

Probit Analysis: Dose Response Curve (Includes FOCAL-CHN)

Rudolph H. de Jong, M. D., University of Washington, School of Medicine, Seattle, Washington

This program transforms dose to log dose and response frequency to probit. It then computes the best-fitting regression from weighted and working probits. The median effective dose (ED_{50}) and its fiducial limits are printed, as are the regression equation and its error, the chi-square value and the degrees of freedom.

Minimum Hardware:	PDP-15/20, two DECtape drives
Storage Requirement:	8K
Source Language:	FOCAL-15

DECUS NO. 15-5

TAP911

Gary D. Schaal, Digital Equipment Corporation, Northbrook, Illinois

This program makes it possible for the user to create PDP-11 absolute format program tapes on a PDP-9 or a PDP-15. It has four parts: CREATE, LIST, PUNCH and MODIFY, all of which are entered via TTY commands.

Minimum Hardware:	PDP-9 or PDP-15, 4K memory PC05 Punch and Reader and TTY
Storage Requirement:	1613_8 locations
Source Language:	MACRO

DECUS NO. 15-6

VJA. - A Handler for the A. B. Dick Videojet Printer

Stanley M. Rose, Laboratory of Computer Science, Massachusetts General Hospital, Boston, Massachusetts

This is a handler for the A. B. Dick 9600 Videojet Printer. It can be conditionally assembled to work with or without forms control, with the DCØ1BB (or DCØ1EB) Scanner or LTØ9/19, and at 250 or 125 character/sec.

DECUS NO. 15-14

COPIER

Stanley M. Rose, Laboratory of Computer Science, Massachusetts General Hospital, Boston, Massachusetts

The COPIER program will translate DEC 5/7 ASCII files into .SIXBT MUMPS readable DECtape, with a directory at the start of the MUMPS tape.

Minimum Hardware:	PDP-9/15 with DECtape and EAE
Other Programs Needed:	Advanced Monitor, DTA, and (optionally) any disk handler
Storage Requirement:	1720_8
Source Language:	MACRO

DECUS NO. 15-15

RBØ9 Diagnostic

Stanley M. Rose, Laboratory of Computer Science, Massachusetts General Hospital, Boston, Massachusetts

RBØ9 is a handler to be incorporated into the PDP-9/15 system diagnostic for the complete testing of the RBØ9 disk system.

Minimum Hardware:	PDP-9/15, DECtape, RBØ9, EAE
Other Programs Needed:	PDP-9/15 System Diagnostic (MAINDEC-15-D7CA)
Storage Requirement:	2025_8
Source Language:	MACRO

DECUS NO. 15-16

FMCDDT - Device Handler for One Pass Compilation/ Assembly (V5A)

John W. Cox and Daniel A. Brody, M. D., University of Tennessee, Memphis, Tennessee

A one-pass card reader and DECtape input device handler for use by FORTRAN 4 and MACRO on 16K or larger PDP-7/9/15 systems running bank mode V5A.

During the first pass of compilation, the source program is read from cards (FMC) or DECtape (FMD), delivered to the compiler/assembler and stored in a 4000 (octal) word buffer in memory. The second pass then obtains the source program from the buffer and does not require that the cards (or DECtape) be read a second time.

A read-ahead feature is incorporated during pass one to allow the input device to be overlapped with the compilers computations. This allows a slow speed card reader to run at maximum speed even when compiling fairly complex FORTRAN statements.

Minimum Hardware:	16K PDP-7/9/15 system, EAE, DECtape, Card Reader
Other Programs Needed:	V5A Software System, CDB
Storage Requirement:	3058_{10} words
Miscellaneous:	This is a rewrite of 9-59, CDTDTT, for V5A operating system
Source Language:	MACRO

DECUS NO. 15-17

Integer Square Root and Distance Routine

Frank Beck, Argonne National Laboratory, Argonne, Illinois

This program consists of two FORTRAN-callable functions. LENDIF finds the exact distance, the nearest integer, between two points whose coordinates are given in integers. ISQRT finds the exact integer square root of a double-length integer held in two locations.

Minimum Hardware:	PDP 15 with EAE
Other Programs Needed:	.DA
Storage Requirement:	122 (decimal) locations
Source Language:	MACRO-15

DECUS NO. 15-18

ADCDH

David Hale, Aston University, Birmingham, England

ADCDH is an external subroutine which can be called by either a FORTRAN 4 or a MACRO program to sample on the A.D.C. The program selects the appropriate multiplexor channel and returns the result of the conversion to a specified resolution within range 6-12 bits. The result is a 2's complement signed single precision integer varying around the midpoint of the converter range.

Minimum Hardware:	8K PDP-9/15 with A.D.C. and multiplexor
Other Programs Needed:	.DA
Storage Requirement:	31 octal words, 25 decimal words
Source Language:	MACRO-9

DECUS NO. 15-19

FILNEX

David Hale, Aston University, Birmingham, England

FILNEX is an external subroutine which allows a 9 character filename to be entered on the TTY. Entry is in IOPS ASCII, therefore Control U (line delete) and normal deletes (backspaces) can be used to modify an incorrect entry. All 9 characters can be used in the filename, but no distinction is made between filename and extension. A space character does not separate the filename and extension (this is merely the particular system adopted for PIP). If you use a space character in the filename it will be included in the filename which cannot then be subsequently PIPed.

Minimum Hardware:	8K PDP-9/15
Other Programs Needed:	PACKER (DECUS NO. 15-20)
Source Language:	MACRO-9

DECUS NO. 15-25 (Continued)

Minimum Hardware: PDP-9/15 with DECtape and EAE
Other Programs Needed: Advanced Monitor, DTA.
Storage Requirement: 544_8
Source Language: MACRO

DECUS NO. 15-26

A PDP-9/PDP-15 Program for Radioactive Decay and Capture Chain Calculations

L. V. East, Los Alamos Scientific Laboratory, Los Alamos, New Mexico

This program calculates the time dependent populations of isotopes in radioactive decay chains, multiple neutron capture chains, or chains having a combination of capture and decay. Each chain may contain up to five members.

Minimum Hardware: 8K PDP-9/15
Other Programs Needed: FORTRAN OTS
Source Language: FORTRAN IV

DECUS NO. 15-27

LPH.

David Hale, Aston University, Birmingham, England

LPH is an IOPS ASCII display device handler for use with the 34H 'scope drive option of a PDP-9 computer. The original version in DECUS NO. 9-29, LPB., was set up to simulate a lineprinter page on a Tektronix 611 storage 'scope. To do this it would write a page of up to 56(10) lines and then halt and wait for an AC switch sign bit change. This enabled the manual erase button to be pressed.

LPH. has been produced to allow the handler to, if needed, write continuously on the display. It is therefore useful for the generation of experimental test and any other display where the halt facility of LPB. would be a nuisance.

Source Language: MACRO-9

DECUS NO. 15-28

GPM Implementation

Michael R. Farmer, Birkbeck College, London, England

This program implements GPM as defined by C. Strachey in his paper: - "A General Purpose Macrogenerator," Computer Journal, October 1965.

Minimum Hardware: PDP-15/10
Source Language: MACRO-15

DECUS NO. 15-29

PDP-15/AD-4 Background/Foreground Interrupt Handling Hybrid Routine

Robert Raspallo, Digital Equipment Corporation, Maynard, Massachusetts

This software is a modification of the PDP-15/AD-4 Keyboard Monitor Operating System Interrupt Handling Hybrid Routine to permit running of the software in the PDP-15/30 Background/Foreground Operating System.

Minimum Hardware: PDP-15/30
Other Programs Needed: PDP-15/AD-4 Hybrid Communication Routines
Source Language: MACRO-15

DECUS NO. 15-30

GAUSS

L. M. Taff, Nuclear Accelerator Institute, University of Groningen, Groningen, The Netherlands

A set of overlayed FORTRAN and assembly language routines which fit up to 3 Gaussian curves and a quadratic background function to experimental data using the least squares criterion. Any parameter(s) may be held constant, including relative separations and/or areas of multiplets. Detailed instructions are given for use by those with essentially no knowledge of computer programming or of the PDP-9/15.

Minimum Hardware: 8K PDP-9/15, EAE desirable, 1 DECtape, Type 34H Oscilloscope, Light pen, CALCOMP Plotter
Other Programs Needed: ADVANCED Software System
Restrictions: Paper tape data input in Multianalyzer block binary format
Source Language: FORTRAN/MACRO

DECUS NO. 15-31

FFI

Clayton Hull, Aeronomy Lab., University of Illinois, Urbana, Illinois

FFI (Free Format Input for FORTRAN Programs) allows data input from console TTY without format restrictions. Data types handled are signed or unsigned integers, REAL numbers entered with or without decimal points or exponents, and ASCII strings of up to 5 non-blank characters. Data items of all types are separated by a comma, tab, CR, or any number of spaces.

Minimum Hardware: BASIC PDP-15 or PDP-9
Other Programs Needed: FIOPS, INTEGER ARITHMETIC, REAL ARITHMETIC
Storage Requirement: 660_8 words
Restrictions: Written for ADVANCED Software System
Source Language: MACRO-15

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
15-1	X	X	X	XX	X			
15-2	X				X			
15-3	X				X			
15-4	X		X					
15-5	X	X	X		X			
15-6	X		X					
15-7	X	X	X					
15-8	X	X	X					
15-9A	X	X	X					
15-9B	X	X	X					
15-10	X	X		XX	X			
15-11	X	X	X	X				
15-12	X			XX	X			
15-13	X			XX	X			
15-14	X		X	XX				
15-15	X	X	X	XX				
15-16	X		X					
15-17	X		X	X				
15-18	X	X	X	X				
15-19	X	X	X	X				
15-20	X	X	X	XX				
15-21	X				X			
15-22	X			XX	X			
15-23	X				X			
15-24	X		X	XX				
15-25	X		X	XX				
15-26	X			X	X			
15-27	X	X	X	XX				
15-28	X		X	XX				
15-29	X				X			
15-30	X				X			

* X - Listing with write-up XX - Listing available at a handling charge

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15-3	A Software Package for the DEC PDP-15/20/30 and the HP5610A Analog to Digital Converter
15-4	Probit Analysis: Dose Response Curve (Includes FOCAL-CHN)
15-5	TAP911
15-6	VJA. - A Handler for the A. B. Dick Videojet Printer
15-7	NUMBER
15-8	BASKET
15-9A&B	DTS. and DTT.
15-10	A PDP-8 Simulator for the PDP-15
15-11	Subroutine CUBRT
15-12	CURVES - Curve Fitting Routine for Polynomial and Exponential Functions
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15-18	ADCDH
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15-20	PACKER
15-21	File Compatibility Package - PDP-9/15 DECtape to PDP-11 DECtape
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DECUS NO. 8-395

Space War

Evan Suits, Digital Equipment Corporation, Maynard, Massachusetts

The classic game of Intergalactic Death and Destruction on a LAB-8. Two players vie with ships in space for control of the Universe. The ships may be controlled from the Switch Register or from the AXØ8 front panel Blue Ribbon Connector.

Minimum Hardware:	4K LAB-8 or LAB-8/L, ASR33
Storage Requirement:	25ØØ words
Source Language:	PAL

DECUS NO. 8-396

MTS-6/70 (Millisecond Time-Sharing System)

Charles W. Snyder, Department of Psychology, University of Notre Dame, Notre Dame, Indiana

A laboratory time-sharing system for data processing and control of up to 18 experiments without interaction. Experiment programs in PAL III are called at 1, 10 or 100 Hz for one millisecond per share. Inputs may be sampled at 1000 Hz. The basic system of about 1400 core words includes a scope interactive display, I/O, arithmetic, conversion, keyboard control, and service routines most useful in behavioral research.

Minimum Hardware:	4K PDP-8/I, ASR33, AXØ8 with scope, XR, XM, XC options to 16 analog channels (LAB-8 system), PCØ8 High Speed Reader and Punch
Storage Requirement:	11_{10} pages: Ø2ØØ-Ø377, 52ØØ-7611, plus half of Page Ø
Restrictions:	Experiment programs are not on interrupt and must return within 1 msec.
Source Language:	PAL III

DECUS NO. 8-397

8K Editor

Bill Donelson, The Choate School, Wallingford, Connecticut

This editor was designed to be used with a DF32, but can be used without it as explained in the documentation. The editor contains 30 commands, many of which can use multi-letter search strings. I/O for disk has been greatly improved (Input and Output filenames may be the same !) and Reader/Punch are always enabled. (High Speed)

Minimum Hardware:	8K PDP-8; DF32 and high speed paper tape recommended
Other Programs Needed:	"AF" version of Disk Monitor if Disk I/O is used
Storage Requirement:	[Ø-37771 field Ø (20_8 blocks on disk)
Source Language:	PAL-D

DECUS NO. 8-398

IMAGE

John Alderman, Applied Data Research, Atlanta, Georgia

IMAGE, a program to convert PS/8 'SAVE'd files to binary format, translates a SAVEd file and produces a binary output file, which may then be reloaded using any of the binary loaders of the PDP-8 family. It is useful when the only copy of a working program is on a saved file, or for transmission via paper tape to other installations.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	2000-4400; 16600-17577; 2000-6003
Source Language:	PAL-8

DECUS NO. 8-399

8K FORTRAN Bit Manipulation Subroutines

Michael J. Allen, Lawrence Radiation Laboratory, Livermore, California

Two closed subroutines which may be used by the FORTRAN programmer for bit manipulations. One page of core and EAE are required by each subroutine.

LBYT function subroutine will load a byte of any size into the processor AC, right-adjusted.

SBYT subroutine will insert a byte of any size into a specified integer.

Minimum Hardware:	8K PDP-8, EAE
Source Language:	SABR

DECUS NO. 8-400

Execute Slow

Gary G. Barrett, General Motors Styling Staff, Warren, Michigan

Execute Slow will execute the user's program one instruction at a time. Before the instruction is executed the LINK, ACCUMULATOR, PROGRAM COUNTER and INSTRUCTION are printed on the ASR33. The program only occupies one page and differs from most trace programs in that user instructions are actually executed from the user's original location. Subroutine tracing can be turned off.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	Locations 0001 and 0002 and 6600-6777 (1 page)
Restrictions:	User interrupts may not be used and the 6002 instruction not allowed
Source Language:	PAL III

DECUS NO. 8-401

Dice Game and TIC-TAC-TOE

Lyle Kline, Inglemoor High School, Bethell, Washington

Dice Game simulates a craps table and allows one player to make fictitious bets and roll the dice. Full playing instructions are given by the program when it is run on-line with the BASIC Compiler.

Tic-Tac-Toe is an excellent demonstration program. It is possible to beat the computer for once.

Other Programs Needed: BASIC Compiler
Source Language: BASIC

DECUS NO. 8-402

Resequence

Howard Wolfington, Department of Defense Computer Institute, Washington Navy Yard, Washington, D. C.
Submitted by: W. Kieswetter, Digital Equipment Corporation, Washington, D. C.

This routine will resequence line numbers (and references) within a BASIC program on the TSS-8.

Minimum Hardware: TSS-8
Other Programs Needed: BASIC Compiler
Storage Requirement: 0-4K
Source Language: PAL-D

DECUS NO. 8-403

Stereo - A 2 Channel Music Program

Maurice Retter, University of Oxford, Oxford, England

A musical program, written for the PDP-8, which can control two loudspeakers independently. A frequency is produced by creating a square wave pulse train, where each pulse is generated by an IOT instruction, and the time delay between pulses is under program control. Two channels are made available, if required, by using two IOP pulses from one IOT instruction to activate independent loudspeakers. The program is divided into a coding section, and a decoding section and play routine.

Minimum Hardware: 4K PDP-8, two R3Ø2's, two amplifiers and speakers
Source Language: PAL III

DECUS NO. 8-404

Octal MEM Dump - Extended Memory

Andres T. Siy, Capitol Institute of Technology, Kensington, Maryland

This program's major objective is similar to Digital-8-6-U, to dump memory contents on the teletype. Included or revised are: 1) a CDF instruction; 2) heading routine; 3) ten spaces tab routine and 4) each line begins with an absolute address followed by the first eight words. This process repeats until block is exhausted.

Minimum Hardware: 4K PDP-8, Extended Memory, ASR33
Source Language: PAL III

DECUS NO. 8-405

SOOT

S. de Vries and C. C. Westphal, Royal Dutch Blastfurnaces and Steelworks, Ymuiden, Holland

This program will execute PDP-8 programs under full operator control. SOOT is a debugger of the interpretive type. It can handle all instructions, including those for extended memory.

Minimum Hardware: 4K PDP-8, ASR33
Storage Requirement: 4 pages
Source Language: PAL

DECUS NO. 8-406

STATPAC Revisions for PDP-8/I and TSS/8

Dartmouth College - Revisions by Berkshire Community College
Submitted by: Roger W. Strickland, Berkshire Community College, Pittsfield, Massachusetts

This package contains 11 programs from the original PDP-10 Dartmouth BASIC Statistical Package which have been revised for the PDP-8/I and TSS/8. The documentation consists of a description and listing of each of the programs. The DECtape which is available is a PDP-10 formatted symbolic tape.

Minimum Hardware: PDP-8/T
Other Programs Needed: BASIC
Restrictions: Array sizes very restricted for TSS/8 BASIC
Source Language: BASIC

DECUS NO. 8-407

Patch to Editor (DISK) DEC-D8-ESAD-PB

H. D. Schenk, Deutsche Forschungs-und Versuchsanstalt fur Luft und Raumfahrl, Flughafen, Germany

This patch corrects two errors found in EDIT-D Version ESAD. It allows the Editor to work with "Dn :name" as input or output device for the source file.

Minimum Hardware: 4K PDP-8, Disk or TCØ1
Other Programs Needed: EDIT-D DEC-D8-ESAD-PB
Source Language: PAL-D

DECUS NO. 8-408

Disk Utility Program

P. Galen Lenhert and Douglas Henry, Vanderbilt University, Nashville, Tennessee

Used for disk backups and file storage. All types of files (ASCII, USER, etc.) can be punched by entering the file name or disk block numbers. Files saved by name are restored to any free area on the disk. Program also lists the file directory and erases files. Checksums are provided. Program design and documentation should allow modification to use reader/punches and magnetic tape without great difficulty.

Minimum Hardware:	4K PDP-8, ASR33, one DF-32
Storage Requirement:	Program: 0-2177; Working storage: 3000-7577
Restrictions:	I/O Limited
Source Language:	PAL-D

DECUS NO. 8-409

Card Loader

Peter Barnett, Dubner Computer Systems, New York, New York

With this package, programs may be loaded into the computer from punched cards rather than from paper tape. This is especially convenient for computers not having a high speed paper tape reader. Two programs are provided. The first is a loader using the CR8/I card reader. The second converts binary programs to the proper format for use with the above.

Minimum Hardware:	PDP-8/I, CR8/I card reader
Storage Requirement:	80 core locations for loader, 4K for converter
Source Language:	PAL

DECUS NO. 8-410

Pseudo-Random Number Generator, EAE Version

W. Madeline Webber
Submitted by: Mark F. Lewis, Federal Aviation Administration, Oklahoma City, Oklahoma

This random number subroutine generates numbers identical to those produced by DECUS programs Nos. 5-25 and L-64. Use of EAE greatly speeds execution time.

Minimum Hardware:	PDP-8/12, LINC-8 with EAE
Miscellaneous:	(Also L-114)
Source Language:	PAL-D

DECUS NO. 8-411

Mongoose Display System

Dale Lewellyn, Digital Equipment Corporation, Ann Arbor, Michigan

Mongoose is a set of two programs: Mongoose Sort and Mongoose Display. These programs are used in conjunction with the Lab-8 Advanced Averager and a grid of 16 analog inputs to produce an averaged, 3-D, topographical display surface corresponding to the voltages present at each of the inputs at a particular point in time. Such displays may be produced for each set of points in the signal epochs and are suitable for filming as frames in a motion picture showing the development of the averaged response present simultaneously over a wide area.

Minimum Hardware:	LAB-8 with 16 channels A/D and storage scope
Other Programs Needed:	Advanced Averager, Disk Monitor (optional)
Storage Requirement:	SORT: 10-44 and 7200-7504; Display: 7-177 and 3000-7577
Source Language:	Programs: PAL-D; Tables: MACRO-8

DECUS NO. 8-412

MRS X

F. C. Owen, General Railway Signal Company, Rochester, New York

MRS X is a debugging routine which will report on the teletype all program references to a given object address. A faulty program may be altering the content of a memory location when it is not desired. MRS X will find the instruction that is doing the altering. It is also useful to locate the users of constants, subroutines, etc.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	6600-6766 Page relocatable
Source Language:	PAL III

DECUS NO. 8-413

GROPE III/A and BINLOC

F. C. Owen, General Railway Signal Company, Rochester, New York

Octal machine language program editor and Binary Load-Compare. Combines the functions of several DEC utility routines plus some new features, such as sequential loading and block loading via keyboard and SEARCH. A special "HELP" Loader is furnished with the tapes.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	7100-7777
Miscellaneous:	When ordering tapes, please specify whether Loader is needed for HSR or LSR
Source Language:	PAL III

DECUS NO. 8-414

LIST

F. S. Irani
Submitted by: Danny Harmon, Cognitronics Corporation, Mt. Kisko, New York

Lists the program name and the block numbers it occupies on DECtape. Also lists the numbers of the free blocks.

Minimum Hardware:	4K PDP-8, TC01/TU55
Storage Requirement:	0000 —> 3477 field Ø
Source Language:	PAL

DECUS NO. 8-415

Multiple Unit DECtape Copier

Paul J. Bezeredi, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This program allows the user the advantage of copying more than one DECtape simultaneously while accessing the master DECtape only once, thus saving time when making multi-copies of a program DECtape.

Minimum Hardware:	PDP-8, TCØ1 or TCØ8, 2 TU/55 transports or 1 TU 56 Dual transport
Storage Requirement:	0-777 Main Program; 1000-7100 Buffer Space
Restrictions:	DECtape must be of standard format
Source Language:	PAL

DECUS NO. 8-416

Bibliographical Handling

J. F. Echallier, A. Laviron, F. Peronnet, P. Gerin, I.N.S.E.R.M., Lyon-Bron, France

This program makes it possible to store and to correct bibliographical data, from ASR33 to DECtape. It allows printout of references when given required characteristics. The program should prove useful wherever a great deal of data is to be stored, updated, and easily picked up.

Minimum Hardware:	4K PDP-8, ASR33, 2 DECtapes
Other Programs Needed:	Disk Monitor System (DEC-D8-SBAF)
Source Language:	PAL

DECUS NO. 8-417

XCORE

James Crapuchettes, Stanford Electronics Labs., Stanford University, Stanford, California

This program is used to help in the debugging and documentation of a program. It reads in absolute binary files and uses them to produce a memory allocation map which shows which locations were loaded (these are the locations which will be loaded by a binary loader when reading in these files). The allocation map is output on the teletype with a label when specified by the user.

Minimum Hardware:	PDP-8, TC01/TU55 DECtapes
Other Programs Needed:	DECUS NO. 8-64a (XSYSTEM)
Storage Requirement:	All of field Ø for program and internal tables
Restrictions:	Resides in field Ø, will map fields Ø through 3
Source Language:	PAL III with TEXT pseudo-op

DECUS NO. 8-418A & B

VEKSEL and PAPT

Ronald Zane, Institute for Astronomy, Honolulu, Hawaii

VEKSEL is a subroutine to convert ASCII code to PTTC-8 code commonly used in IBM equipment. PAPT is a program which uses VEKSEL to convert ASCII punched paper tape to PTTC-8 punched paper tape.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	VEKSEL 200-377; PAPT 400-451
Source Language:	PAL III

DECUS NO. 8-419

Nmr - Pulse for the Lab-8/I

Dr. James W. Cooper, Digital Equipment Corporation, Maynard, Massachusetts

Nmr-Pulse is designed for rapid data acquisition and Fourier transformation needed for pulsed nmr spectroscopy. It acquires 512 data points at rates from 34 μsec/point, and signal averages them. The Fourier transform is performed on command and a magnitude spectrum calculated.

Minimum Hardware:	LAB-8/I or 8/L with 4K of core
Source Language:	PAL 1Ø or MACRO-8

DECUS NO. 8-420

LOGSIM-8

Robert Stolarz, Princeton University, Princeton, New Jersey

LOGSIM-8 is an interactive digital logic simulation program for the simulation of combinational and sequential logic circuits at the gate level. The language is simple, and allows logical units such as flip-flops to be called as functions. The output consists of a table of the values of selected variables during each pass through the circuit description.

Minimum Hardware:	4K PDP-8, TTY

DECUS NO. 8-421

Chain Load

Claude J. Ortega, University of Chicago, Department of Medicine, Chicago, Illinois

This program supervises the loading from the systems device, of multiple field and/or multiple file system saved programs through the calling of a one page routine.

Minimum Hardware:	4K PDP-8, DECtape or disk, ASR33
Other Programs Needed:	4K Disk Monitor System, Version AF
Storage Requirement:	200-377 5600-5777
Source Language:	PS/8 PAL8

DECUS NO. 8-422

Binary Punch - Extended Memory II

James Vrancik, NASA, Lewis Research Center, Cleveland, Ohio

This program is an extension of Digital 8-5-U Binary Punch and DECUS NO. 8-142. It accommodates extended memory, punches data in blocks and does not punch consecutive halts. The write-up includes a short program to load the core with halts. The produced tapes can be loaded by Digital 8-2-U Binary Loader.

Minimum Hardware:	PDP-8, ASR33
Storage Requirement:	7600-7754
Source Language:	PAL III

DECUS NO. 8-423

Disk Editor With View for LAB-8

K. W. Ranatunga, University of Bristol, The Medical School, Bristol, England

Disk Editor (DEC-D8-ESAB-PB, 1968) has been modified slightly so that a 'V' (view) command made via the teletype is recognized. This command is like a 'L' (list) command except that the requested line of the text buffer is displayed on a CRO screen along with the 17 succeeding lines. Further, the reference numbers of these lines as given by the Editor are also displayed.

Minimum Hardware:	4K PDP-8/I, AXØ8 with option XR, Disk File (DF32)
Other Programs Needed:	Disk Editor (DEC-08-ESAB-PB)
Restrictions:	For each view command the corresponding display is issued only once, and thus the display should be stored on a storage CRO screen
Source Language:	PAL-D

DECUS NO. 8-424

Morse Code

C. Bumgardner and T. Bell
Submitted by: T. L. Drake, Clemson University, Clemson, South Carolina

This program accepts Morse code via a logic sense line in real-time and outputs the decoded message on the teleprinter. The pattern recognition algorithm in the program automatically adapts to the sending rate with the maximum reception rate of the computer being limited by the teleprinter to about 100 words per minute. The program classifies a key down condition as either a dot or a dash. The key up conditions are classified either as a space in a character, a space between characters, or a space between words. These pattern classifications permit each character to be decoded via a table look up.

Minimum Hardware:	4K PDP-8, Real-time Clock, Logic Sense Line
Miscellaneous:	Decoding algorithm does a better job when code is generated by an electronic keyer
Source Language:	XPAL, PAL III

DECUS NO. 8-425

Block-Modify for PS/8

Rudi Stange, Digital Equipment GmbH, Munich, Germany

This program is similar to the BLOCK-MODIFY for the Disk Monitor System, but uses the PS/8 DECtape Handler. It also can be changed to use any other PS/8 handler. It allows typeout of contents of any block (DECtape or Disk) and permits changes to any location in the specified block.

Minimum Hardware:	8K PDP-8, TC01 or DF32 or other Disk
Other Programs Needed:	PS/8 System
Storage Requirement:	4000-4577, page Ø as Buffer and LOC; 3000-3577 for PS/8 Handler storage
Source Language:	PAL 8

DECUS NO. 8-426

Prime Number Generator

Anonymous

This is a short, simple program to output prime numbers. No write-up - tape only.

Source Language:	BASIC

DECUS NO. 8-427

MEMO - A Text Formatting Program

Gregory Ruth, MIT, Charles Stark Draper Laboratory, Cambridge, Massachusetts

MEMO transforms free-form text into paged right-and-left-justified output suitable for documentation. The input file (of text) must be produced by EDIT or have identical appearance.

Minimum Hardware: PDP-8, ASR33, DECtape or Disk
Other Programs Needed: PS/8 System
Storage Requirement: Locations 0-3377
Source Language: PAL 8

DECUS NO. 8-428A

EAE-Modification to DECUS NO. 8-143, FFTS-R

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-143 FFTS-R - A Fast Fourier Transform Subroutine for Real Valued Functions, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-428B

EAE - Modification to DECUS NO. 8-144, FFTS-C

Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This program allows the user to run the program, DECUS NO. 8-144 FFTS-C - A Fast Fourier Transform Subroutine for Complex Data, on a PDP-8/I Computer which does not have the extended arithmetic element (EAE) option. All EAE instructions are replaced by equivalent JMS instructions.

Minimum Hardware: 4K PDP-8/I
Source Language: PAL III

DECUS NO. 8-429

Intercorrelation 37

Gernot D. Kleiter and Ludwig R. Krysl, Psychologisches Institut der Universitat Salzburg, Salzburg, Austria

This program computes up to 630 intercorrelations (36 variables).

Minimum Hardware: PDP-8 with TTY, 4K CPU
Other Programs Needed: Floating Point Package #2 (Digital 8-5B-S)
Source Language: PAL III

DECUS NO. 8-430

DECK: A Random Deck of Cards

Alan Weiner, Needham High School, Needham, Massachusetts

DECK is a routine for getting an entire 52 card deck on a computer. As it is currently written it merely prints the deck out on the teletype. The algorithm used is simple; most of the program is used for typing the deck out in words.

Minimum Hardware: TSS/8, TTY
Source Language: BASIC8

DECUS NO. 8-431

8/I LAB Data System

Dr. D. J. Fader, Research Engineer, University of Western Ontario, London, Ontario, Canada

A system of programs for data acquisition and processing is described. A PDP-8 with special A/D and D/A hardware is used to produce mean, rms, histograms, covariances, correlations and other properties of analog input signals. Routines are available for processing results using FOCAL and a Compucorder tape cassette unit, and using a PDP-10 with a digital plotter.

Due to the sheer size of the documentation for this program we have broken it into two parts. The first, a "teaser" is supplied under the same circumstances as in normal documentation. The second, a set of five thick manuals, is subject to an extra charge. Contact the DECUS office for more information.

Minimum Hardware: 8K PDP-8, TTY, PDP-10 plus other devices noted in manuals
Storage Requirement: 8K PDP-8, 20K PDP-10
Restrictions: Use of all features requires special hardware
Source Language: PAL III, FORTRAN, FOCAL

DECUS NO. 8-432

Triple Precision Integer Package

M. T. Franklin, The Plessey Company, Limited, Fareham, Hampshire, England

This is a collection of useful subroutines for handling triple precision binary integers which are assumed to be positive numbers. They were developed for data processing type work and accounting where it was not desirable to use the floating point system.

Minimum Hardware: PDP-8, HSR/P, TTY

DECUS NO. 8-433

Extensions to "LIBRA-FOCAL"

B. Taylor, R. Helwig, A. Coston, L. L. Thurstone Psychometric Laboratory, University of North Carolina, Chapel Hill, North Carolina

Certain changes have been made to the LIBRA 7-user FOCAL system (DEC-08-AJ5E) and also to FOCAL 1969 (DEC-08-AJAE). They include: FOCAL - Random number generator, power routine, symbol table checkpoint; LIBRA - Disk Data files, file protection, expanded FCOM function, correct user number on called programs; LIBRA - (optionally) - 680 teletype support, EAE support, DECtape save-restore (Reference Disk utility program).

Minimum Hardware:	8K PDP-8, optionally DF32 or RF08 Disk, EAE, DECtape, PT08 Teletypes or 680 Teletypes
Other Programs Needed:	FOCAL 1969, LIBRA.DF32 or LIBRA.RF08
Storage Requirement:	All of fields 0 and 1
Source Language:	PAL-8 with conditional assemblies

DECUS NO. 8-434.1 through 8-434.7

Data System for Magnetic Scanning Mass Spectrometers

James Plattner, University of Colorado Medical Center, Denver, Colorado

There are seven programs included in this system. The programs and their functions are:

8-434.1 SCAN - Acquires data from mass spectrometer and stores it on disk in Disk Monitor System format.

8-434.2 STD - Automatically identifies and converts times of peak emergence to masses for a scan of perfluoroalkane that has been acquired with the SCAN program. These results are stored on the disk for future use.

8-434.3 CONV - Effects a time to mass conversion by interpolation of a file of unknown compound spectra acquired with the SCAN program vs. a file of perfluoroalkane that has been acquired by the SCAN program and identified with the STD program.

8-434.4 TIC - Plots total ion current for a series of scans acquired by SCAN and time to mass converted by CONV.

8-434.5 TAB - Prints listings of spectra that have been converted to mass intensity files by the CONV program.

8-434.6 HIST - Plots spectra that have been acquired by SCAN and time to mass converted by CONV.

8-434.7 TUNE - Allows mass spectrometer interface to be optimized. Accumulator displays bias, oscilloscope displays timing pulses (sample rate).

Some of these programs can be implemented to work with other systems and therefore the tapes for each program may be ordered separately.

Minimum Hardware:	4K PDP-8, DF32 disk, ASR33, ADC1 A/D Converter, ms Computer interface
Other Programs Needed:	Disk Monitor System
Miscellaneous:	Incremental Plotter Optional
Source Language:	PAL-D

DECUS NO. 8-435

RECOVER

Kenneth H. Kolley
Submitted by: Michael Schatzberg, Singer-Kearfott Division, Fairfield, New Jersey

This is a program to read or write 32K words between disk and DECtape. This utility provides for saving a disk image on DECtape, restoring the disk from an image on tape and verifying a disk image against a DECtape. It is a disk to-and-from DECtape program.

Minimum Hardware:	8K PDP-8/I, DF32 disk, 1 DECtape
Storage Requirement:	0-1577 field Ø
Source Language:	MACRO-8, PAL-8

DECUS NO. 8-436

EAE - Simulator

Tuan VoDinh and Urs P. Wild, Physical Chemistry Laboratory, Federal Institute of Technology, Zurich, Switzerland

This software simulates all the Extended Arithmetic Element (EAE) hardware instructions and allows the user to run any program which was originally written for a PDP-8/I having the EAE option on a PDP-8/I without it. All EAE instructions have to be replaced by corresponding JMS instructions.

Minimum Hardware:	PDP-8/I
Storage Requirement:	20_8 locations on page Ø plus 2 pages
Source Language:	PAL III

DECUS NO. 8-437

Computer Dating Game

Miller S. Lessell, William Diamond Junior High School, Lexington, Massachusetts

The purpose of this program is to measure the compatibility of two people by the similarity of their answers to questions on a broad variety of subjects.

Minimum Hardware:	4K PDP-8, ASR33, TTY
Source Language:	BASIC

DECUS NO. 8-438

DF-32/Sykes Swap

R. Dell and D. Branda, University of Illinois at Chicago Circle, Chicago, Illinois

This pair of programs transfers the entire contents of the DF-32 disk to or from a Sykes Compu-Corder model 1ØØ Tape Unit. It is useful for saving additional or special versions of the Disk Monitor System.

Minimum Hardware:	PDP-8/I, DF-32, EAE, Sykes Compu-Corder Cassette
Other Programs Needed:	"BASIC" routine supplied by Sykes
Storage Requirement:	Buffer: 0-6001; Coding: 6002-6777
Source Language:	PAL-D

DECUS NO. 8-439

MOVE

John Alderman, Applied Data Research, Atlanta, Georgia

This is a program to copy images of directory devices, including the system portion of SYS:.

The program will be obsoleted by DEC supplied version of PIP eventually.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8 System
Storage Requirement:	2000-5000
Source Language:	PAL-8

DECUS NO. 8-440

PIPL

John Alderman, Applied Data Research, Atlanta, Georgia

This is a version of PS/8 PIP, modified to add two options, in order to be able to label paper tapes with legible symbols punched into the tapes.

These new options are /M (mark) and /W (write). They are used with either ASCII or Binary mode file transfers under PS/8, and usually are intended for direct output onto a paper tape punch, although any output device is legal.

Minimum Hardware:	PS/8 Configuration
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. 8-441

DELETE

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

DELETE is a small PS/8 utility program which will delete up to nine files specified in a Command Decoder input string. If the terminating character is ALT MODE, DELETE will return to the monitor when deletion is complete. Otherwise it will request another input string.

Minimum Hardware:	8K PDP-8 with 2 mass storage devices
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12000-12577; 12600-13177 (buffer); 03200-03377 (I/O handler)
Source Language:	PAL-8

DECUS NO. 8-442

"The BYU Boob Tube"

Associated Computer and Electronic Technologists
Submitted by: James A. Williams, Brigham Young University, Provo, Utah

When loaded and run under COLPAC 1970 (DECUS NO. 8-335) this program will, by presentation on a CRT, show the capabilities of a PDP-8 to make movies. It is a short cartoon demonstration program which uses most locations in a typical 8K PDP-8 (field 0 & 1). The program was written by students in the Electronics Technology department at BYU; comments may be directed to James A. Williams.

Minimum Hardware:	8K PDP-8, HSR, ASR33/35, KV-8 CRT or equivalent
Other Programs Needed:	COLPAC, 1970 (DECUS NO. 8-335)
Source Language:	COLPAC 1970

DECUS NO. 8-443

Keyboard Test Tape for Hot Metal Linecasters with TTS

Lance O. McCartney, Ambassador College Press, Pasadena, California

The purpose of this program is to test linecaster TTS units with tape to operate in keyboard order with slight pause between characters. Quad center code is not included but could easily be added.

Minimum Hardware:	4K PDP-8/I, High-speed 6 level paper tape punch
Storage Requirement:	0-500
Source Language:	PAL III

DECUS NO. 8-444

COREMAP

Joel Troster, Institute of Bio-Medical Electronics and Engineering, University of Toronto, Toronto, Ontario, Canada

This is a one page relocatable program to type a map of any field of core by searching for a number set in the S.R. (e.g. HLT or Zero).

Minimum Hardware:	PDP-8, ASR
Storage Requirement:	7600-7611, 7617-7623 plus 1 page anywhere
Source Language:	PAL III

DECUS NO. 8-445

FYLHLP - PS/8 File Utility Program

David M. Kristol, 2401 Pennsylvania Avenue, Wilmington, Delaware

FYLHLP is a utility program designed to help the PS/8 systems programmer maintain the file system and debug file handling programs. It allows the user to list specific directory entries plus all "empty" entries on a file-structured device and to examine, modify and search blocks on the same device.

Minimum Hardware:	8K PDP-8; a mass storage device
Other Programs Needed:	PS/8 Operating System
Storage Requirement:	12ØØØ-12577; 126ØØ-13177 (buffer); Ø32ØØ-Ø3377 (I/O Handler)
Source Language:	PAL-8

DECUS NO. 8-446

A Patch to FFTS-R for Use Without the EAE

Gregory R. Ruth, MIT Charles Stark Draper Laboratory, Cambridge, Massachusetts

This patch permits the use of the Fast Fourier Transform subroutine for real valued functions (DECUS NO. 8-143) on machines without an EAE. Except for the speed of execution, the subroutine is in no way affected. Execution times for the subroutine with the patch are about three times longer.

Minimum Hardware:	4K PDP-8
Other Programs Needed:	FFTS-R (DECUS NO. 8-143)
Storage Requirement:	136_8 locations
Source Language:	PAL-8

DECUS NO. 8-447

Roots of a Polynomial by Muller's Method

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program implements Muller's root-finding method for users of BASIC. The program guides the user through entering the necessary data. Then the data are echoed in easily-readable format. After a delay until all roots are evaluated, the program types out the roots in tabular form.

Minimum Hardware:	8K PDP-8/I, ASR33
Other Programs Needed:	Edusystem 20 BASIC
Restrictions:	Execution time may be long
Source Language:	BASIC (Edusystem 20 implementation)

DECUS NO. 8-448

CORDMP - Formatted Octal Dump

Arthur L. Pike, Tufts University, Medford, Massachusetts

This program punches an octal core dump into tape for off-line listing. The dump arranges the contents of 8 core locations on a line, with the starting address at the left, and with column headers for easy reading. Markers are provided for cutting the listings into 11-inch lengths. The accumulator lights display each address being punched.

Minimum Hardware:	4K PDP-8/I, ASR33, HSP
Storage Requirement:	One page page-relocatable in any field
Restrictions:	Dumps only one field or portion at a time
Source Language:	PAL-8/PAL III

DECUS NO. 8-449A

A Magtape Handler for the PDP-8/TU20

Howard Shapiro and Peter Lemkin, National Institutes of Health, Bethesda, Maryland

An I/O device handler is given for the TU20/TC58 Magtape. It enables reading, writing, read compare, advance and backspace records and writing end of files. It can also sense the tape's condition.

Minimum Hardware:	4K PDP-8, TU20/TC58 Magtape
Other Programs Needed:	Interrupt handler to dispatch to the magtape interrupt service routine
Storage Requirement:	Magtape is 1 page, buffer may be up to 4K in any field
Restrictions:	Set up for running on interrupt
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449B

LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

LPTQUE is a PDP-8 utility program which is used to buffer ASCII characters input from a PTØ8 to an A. B. Dick 94Ø Line Printer using the Eclectic Computer Company interface. The PDP-8 teletype may be used to send data out of the PTØ8.

Minimum Hardware:	4K PDP-8, A. B. Dick 94Ø Line Printer with Eclectic Computer Company Interface, PTØ8
Storage Requirement:	<200,577>, <600,4577>
Restrictions:	Form feeds and tabs not implemented
Source Language:	PAL-1Ø, PAL-D

DECUS NO. 8-449C

TALK1Ø - A PDP-8/PDP-10 Utility-Loader

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

The assembly of large programs for small machines such as a PDP-8 is apt to be laborious, time consuming and almost impossible if done on the small machine itself. In addition, the ability for many users to assemble PDP-8 programs on a PDP-10 computer using PAL-1Ø or PAL-12 lightens the load of software development on the smaller machine. TALK1Ø is

DECUS NO. 8-449C (Continued)

a PDP-8 utility/loader program. It decodes and loads ASCII coded binary files (encoded by TALK8F, DECUS NO. 10-139) sent from the PDP-10. It can transmit information to or from the PDP-10, appearing to it as a regular teletype.

Minimum Hardware:	4K or more PDP-8 with PTØ8 Interface to Dataphone or directly to PDP-10
Other Programs Needed:	TALK8F (DECUS NO. 10-139), PAL1Ø or PAL 12, all on PDP-10
Storage Requirement:	Currently <7ØØØ-7577> for program, <3200-6777> for the buffer
Restrictions:	If the PTØ8 data rate is 1Ø char/sec, large TTY buffers will overflow
Source Language:	PAL-1Ø

DECUS NO. 8-449D

Buffered I/O Subroutines for the PDP-8

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

BUF1Ø is a collection of three PDP-8 PAL subroutines which can be used for doing asynchronous character input/output. They are also useful for doing any word asynchronous queuing in other types of programs.

Minimum Hardware:	4K PDP-8
Storage Requirement:	1 page for the program and QUEUE size
Restrictions:	QUEUE size must be $<4ØØØ_8$ locations
Source Language:	PAL

EDITOR'S NOTE: The above 4 programs (8-449A, B, C, D) are available on one PDP-10 formatted DECtape together with DECUS NO. 10-139.

DECUS NO. 8-450

PS/8 Editor With Display for KV8/I (Overlay)

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This overlay provides the user with a welcome expansion of the PS/8 EDITOR. It provides: 1) Variable-size character generator, 2) Display of line numbers in scope-mode, 3) Too long lines cause automatic CRLF, 4) Permanent incorporation of HSR for "APPEND," "INSERT" from high speed reader.

Minimum Hardware:	PDP-8 with KV/8 Display and/or HSR
Other Programs Needed:	PS/8 Monitor System, PS/8 Editor
Storage Requirement:	15600-16577
Source Language:	PAL III, PAL-8

DECUS NO. 8-451

PS/8 Handler for KV/8 Vector Display

Floor Anthoni, Biomedical Lab. TNO, Rijswijk, The Netherlands

This character generator is primarily intended to be incorporated as a device-handler in a PS/8 oriented system. It was especially designed to fit in a very small space (2-page handler). Upon entry it computes cross-page references and indirect pointers from a JMS. instruction, and is therefore completely page-relocatable. It detects CTRL/FORMs and full picture condition and then waits for the ERASE-button to be pushed.

Minimum Hardware:	PDP-8 with KV/8 Display System
Other Programs Needed:	PS/8 Programming System
Storage Requirement:	2 pages, Run-time Relocatable
Restrictions:	No tabulation incorporated
Source Language:	PAL III, PAL-8

DECUS NO. 8-452

ANSAM (Analog Sampling)

Edward Longhi, VEECO Instruments, Inc., Plainview, Long Island, New York

It is often desirable to set the level of an external device connected to the AXØ8. This program allows the user to have typed out the voltage level appearing at analog channel Ø, 1, 2 or 3 of the AXØ8. The channel to be sampled is entered via the TTY and continuous sampling ensues until halted by striking a random key. A new channel may then be selected. Typeout is directly in millivolts, including sign.

Minimum Hardware:	PDP-8, AXØ8, ASR33
Storage Requirement:	1 page
Source Language:	PAL III

DECUS NO. 8-453

Rapid Alert Program (RAP)

Richard Bachman, U. S. Naval Undersea Research and Development Center, San Diego, California

RAP, used to predict Naval Navigation Satellite rise times, is approximately 100 times faster than previous alert programs. Degradation of alert accuracy is insignificant.

Minimum Hardware:	4K PDP-8, ASR33
Other Programs Needed:	FORTRAN Compiler and Operating System (DEC-08-AFC1-PB and DEC-08-AFC3-PB)
Storage Requirement:	0-6066, 7267-7777
Source Language:	FORTRAN

DECUS NO. 8-454

Radio Teletype to ASCII

Carl Kishline, University of Wisconsin, Parkside Instructional Computing Center, Kenosha, Wisconsin

This program reads 5-channel tape as generated by a model 15 or 19 teletype and prints (and optionally punches) the corresponding characters in ASCII code. It thus allows computer operators to enjoy the beautiful art work which amateur radio operators produce.

Minimum Hardware:	4K PDP-8, ASR33
Storage Requirement:	2 pages
Source Language:	PAL-D

DECUS NO. 8-455

CRTPAC

B. K. Moritz and M. E. VanHoosier, Naval Research Laboratory, Washington, D. C.

CRTPAC is a flexible high speed character generator and display package. It features a full ASCII character set, sub and superscripting and variable character size under program control. It makes use of a column representation algorithm resulting in average character display time well under 600μs.

Minimum Hardware:	4K PDP-8/I, VC8I or equivalent, EAE recommended
Miscellaneous:	Tapes available require EAE
Source Language:	PAL-8

DECUS NO. 8-456A

PIP "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

PIP "AH" is a modification of PIP "AF" (DEC-D8-PDAD) for use with the RK08 cartridge disk file and BUILD "AH" (DECUS NO. 8-456B). The LP08 line printer has been implemented to list ASCII files and device directories. Other changes to PIP have corrected tab control for ASCII files, provided paging for the ASR33 teletype, eliminated problems in combining ASCII files, and removed the S: , SØ: restriction for the RF08 and DECtape. Versions of PIP "AH" are also available for DF32, RF08 and DECtape systems.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	BUILD "AH" (DECUS NO. 8-456B)
Storage Requirement:	25 octal blocks
Source Language:	PAL

DECUS NO. 8-456B

BUILD "AH"

L. H. Nichols, III and K. M. Bowyer, E. I. DuPont de Nemours and Company, Wilmington, Delaware

BUILD "AH" is an extension of the "AF" Disk System Builder (DEC-D8-SBAF) and will build the Disk/DECtape Monitor System on the RK08 cartridge disk file. The RK08 system structure is similar to the RF08, with each cartridge containing two pseudo devices. Each pseudo device has a storage capacity of 3,000 octal blocks and its own directory. BUILD "AH" also permits the LP08 line printer to be defined as a system output device recognized by the command decoder. All functions of the "AF" builder are retained. BUILD "AH" eliminates required conversion of programs currently operating under the Disk Monitor System when the RK08 is obtained for use with PS/8.

Minimum Hardware:	Disk Monitor Environment
Other Programs Needed:	PIP "AH" (DECUS NO. 8-456A)
Source Language:	PAL

DECUS NO. 8-457

DTFIX

P. T. Hodgin, Jr., Research Computation Center, Indianapolis, Indiana

This is a TSS/8 program to handle DECtapes, including ZEROing, COPYing, LISTing and DEPOSITing. A method is available to return to "OPTION?" at any time during the running of the program.

Minimum Hardware:	PDP-8/I with TS/8 Monitor (or equivalent), DECtapes
Other Programs Needed:	TS/8 Monitor
Storage Requirement:	6 Disk Segments (12 DECtape segments)
Source Language:	PAL-D

DECUS NO 8-458

VW - Field Independent I/O Handler for Disk and TTY

R. A. Seeman, The Boeing Company, Renton, Washington

This program provides field independent disk transfers and TTY message typeout. It can reside in any core field and can be called from core field without restriction, except that the program cannot reside in Page Ø. It is a user called subroutine and requires no program other than the user program.

Minimum Hardware:	4K PDP-8, ASR33 or 35, DF32
Storage Requirement:	200_8 (one page)
Source Language:	PAL-D

DECUS NO. 8-459

TAYEX - Taylor Expansion Equation Solver

David G. Pitts and James Westgard, Indiana State University, Terre Haute, Indiana

TAYEX is a program to solve differential equations by use of the Taylor series and an iteration procedure for the coefficients. It can solve any number of simultaneous nonlinear differential equations. One pass of the program is needed to type a table of values for each variable.

Minimum Hardware:	PDP-8, ASR33
Other Programs Needed:	Basic Floating Point Package (DEC-08-YQ1A-PB) or 4 word Floating Point Package (DEC-08-FMHA-PB)
Storage Requirement:	0-577, 5600-7577
Source Language:	PAL III

DECUS NO. 8-460

TT89 - Tape Transfer PDP-8 to PDP-9

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

This program writes ASCII files from PDP-8 devices onto a PDP-9 DECtape. The PDP-9 DECtape directory can also be listed or zeroed, and files can be deleted.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-D

DECUS NO. 8-461

COPY1Ø - PDP-10 DECtape Program for the PDP-8

Frank J. Nagy, Carnegie Mellon University, Pittsburgh, Pennsylvania

COPY1Ø reads and writes files between PDP-8 devices (disk, DECtape, paper tape) and a PDP-10 DECtape. ASCII files can be read from or written to the PDP-10 DECtape. BIN files (generated by PAL-10) can also be read. Program also reads PDP-10 ASCII paper tapes.

Minimum Hardware:	8K PDP-8, TCØ1 DECtape Control with 2 DECtape drives
Other Programs Needed:	Disk/DECtape Monitor System
Source Language:	PAL-1Ø

DECUS NO. 8-462

INSTIN

Paul Kinzelman, Carnegie Mellon University, Pittsburgh, Pennsylvania

INSTIN is a program which will solve instant insanity. The puzzle consists of four cubes, each side of which is colored white, red, green or blue. To solve the puzzle, one must stack the cubes in a line so that each color appears only once along a side which is four cubes long. The program will find and print out all the basic solutions. The program allows the user to change the puzzle by switching colored sides or by changing the color of sides. The user may inhibit the printing of the solutions to determine the number of basic solutions quickly.

Minimum Hardware:	Any configuration which will run BASIC
Miscellaneous:	Owning the puzzle "Instant Insanity" seems to be a prerequisite
Source Language:	BASIC

DECUS NO. 8-463

Perpetual Calendar (BASIC Version)

Daniel Gutierrez, Granada Hills High School, Granada Hills, California

This program is similar to DECUS NO. 8-71 but is written in BASIC. It will provide the day of the week for any date entered. It is particularly useful for demonstrating the computer's ability to perform simple problems as well as more complex ones.

Minimum Hardware:	4K PDP-8 with Teletype
Source Language:	BASIC

DECUS NO. 8-464

TRØ2 Magnetic Tape Device Handler for PS/8

Lawrence E. Holboke, Environmental Protection Agency, Cincinnati, Ohio

This is a two page TRØ2 magnetic tape handler operating in a manner similar to DECtape. Some PS/8 functions (GET, SAVE, RUN, etc.) will not work in the present version. Each block of data (2 pages) is contained within one tape block along with parity and block number identification.

Minimum Hardware:	PS/8 Operating System, 7 track TRØ2 tape unit
Other Programs Needed:	MTAMRK and INIT (Included)
Storage Requirement:	2 pages (256 words)
Source Language:	PAL

DECUS NO. 8-465

The SKED Software System

Dr. A. G. Snapper, Psychology Research Lab., Franklin D. Roosevelt V. A. Hospital, Montrose, New York

Contribution and submittal by: Andrew Walker, Digital Equipment Corporation, Maynard, Massachusetts

SKED is a process control software system that has been developed for use in the behavioral research laboratory. The software system consists of:

A. The Two-Pass SKED Compiler
B. The Run Time System (R.T.S.)
C. The DEBUG System
D. The System Builder

Minimum Hardware: 4K PDP-8, ASR33, real-time 100 cycle clock, hardware interface between processor and the experimental stations. High speed reader and punch and extra 4K useful and desireable

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE BIN	PAPER TAPE ASCII	LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
8-383A	X	X						
8-383B	X	X						
8-383C	X	X						
8-384	X	X	X	XX				
8-385	X			X				
8-386	X			X				
8-387	X	X	X	XX				
8-388	X	X	X	XX				
8-389	X	X	X	XX				
8-390	X	X		X				
8-391	X		X	X				
8-392	X	X			X (PDP-10 FORMAT)			
8-393	X			XX	X			
8-394	X			X				
8-395	X	X		XX				
8-396	X	X	X	XX				
8-397	X	X						
8-398	X	X	X	XX				
8-399	X	X	X	XX				
8-400	X	X						
8-401	X			X				
8-402	X		X	X				
8-403	X	X	X	XX				
8-404	X	X	X					
8-405	X	X	X					
8-406	X			X				
8-407	X	X	X	X				
8-408	X	X	X	XX				
8-409	X			XX				X
8-410	X			X				
8-411	X	X	X	XX				

* X - Listing with write-up XX - Listing available at a handling charge

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
8-412	X	X	X					
8-413	X	X	X					
8-414	X	X		X				
8-415	X	X	X	XX				
8-416	X	X						
8-417	X				X			
8-418A	X	X	X	XX				
8-418B	X	X	X	XX				
8-419	X	X	X	XX				
8-420	X	X						
8-421	X		X					
8-422	X	X	X	XX				
8-423	X	X	X	XX				
8-424	X	X	X	XX				
8-425	X	X	X	XX				
8-426		X						
8-427	X	X	X	XX				
8-428A	X	X	X	XX				
8-428B	X	X	X	XX				
8-429	X	X	X	XX				
8-430	X		X	XX				
8-431	X	X		XX				
8-432	X		X					
8-433	X		X	XX				
8-434.1	X	X	X	XX				
8-434.2	X	X	X	XX				
8-434.3	X	X	X	XX				
8-434.4	X	X	X	XX				
8-434.5	X	X	X	XX				
8-434.6	X	X	X	XX				
8-434.7	X	X	X	X				

* X - Listing with write-up XX - Listing available at a handling charge

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
8-435	X	X	X	XX				
8-436	X	X	X	X				
8-437	X			X				
8-438	X	X	X	XX				
8-439	X	X	X					
8-440	X	X	X					
8-441	X	X	X	XX				
8-442	X		X	X				
8-443	X	X	X	X				
8-444	X	X	X					
8-445	X	X	X	XX				
8-446	X	X	X	X				
8-447	X		X	X				
448	X	X	X	X				
8-449A	X			X	X (PDP-10 FORMAT)			
8-449B	X			X	X			
8-449C	X			X	X			
8-449D	X			X	X			
8-450	X	X	X	XX				
8-451	X		X					
8-452	X	X	X	X				
8-453	X	X	X					
8-454	X	X	X	X				
8-455	X	X	X	XX				
8-456A	X	X		XX	X			
8-456B	X	X		XX	X			
8-457	X	X	X	XX				
8-458	X	X	X	X				
'59	X	X	X	XX				
8-460	X	X	X					
8-461	X	X	X					

* X - Listing with write-up XX - Listing available at a handling charge

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
8-462	X		X	X				
8-463	X		X	X				
8-464	X	X	X	XX				
8-465	X	X			X			

* X - Listing with write-up XX - Listing available at a handling charge

DECUS NO.	TITLE
8-398	IMAGE
8-399	8K FORTRAN Bit Manipulation Subroutines
8-400	Execute Slow
8-401	Dice Game and TIC-TAC-TOE
8-402	Resequence
8-403	Stereo - A 2 Channel Music Program
8-404	Octal MEM Dump - Extended Memory
8-405	SOOT
8-406	STATPAC Revisions for PDP-8/I and TSS/8
8-407	Patch to Editor (DISK) DEC-D8-ESAD-PB
8-408	Disk Utility Program
8-409	Card Loader
8-410	Pseudo-Random Number Generator, EAE Version
8-411	Mongoose Display System
8-412	MRS X
8-413	GROPE III/A and BINLOC
8-414	LIST
8-415	Multiple Unit DECtape Copier
8-416	Bibliographical Handling
8-417	XCORE
8-418A&B	VEKSEL and PAPT
8-419	Nmr-Pulse for the Lab-8/I
8-420	LOGSIM-8
8-421	Chain Load
8-422	Binary Punch - Extended Memory II
8-423	Disk Editor With View for LAB-8
8-424	Morse Code
8-425	Block-Modify for PS/8
8-426	Prime Number Generator
8-427	MEMO - A Text Formatting Program
8-428A	EAE - Modification to DECUS NO. 8-143, FFTS-R
8-428B	EAE - Modification to DECUS NO. 8-144, FFTS-C
8-429	Intercorrelation 37
8-430	DECK: A Random Deck of Cards
8-431	8/I LAB Data System
8-432	Triple Precision Integer Package
8-433	Extensions to "LIBRA-FOCAL"
8-434.1 thru 8-434.7	Data System for Magnetic Scanning Mass Spectrometers
8-435	RECOVER
8-436	EAE - Simulator
8-437	Computer Dating Game
8-438	DF-32/Sykes Swap
8-439	MOVE
8-440	PIPL
8-441	DELETE
8-442	"The BYU Boob Tube"
8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-444	COREMAP
8-445	FYLHLP - PS/8 File Utility Program
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-448	CORDMP - Formatted Octal Dump
8-449A	A Magtape Handler for the PDP-8/TU20
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
8-449D	Buffered I/O Subroutines for the PDP-8
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-452	ANSAM (Analog Sampling)
8-453	Rapid Alert Program (RAP)
8-454	Radio Teletype to ASCII
8-455	CRTPAC
8-456A	PIP "AH"
8-456B	BUILD "AH"
8-457	DTFIX
8-458	VW - Field Independent I/O Handler for Disk and TTY
8-459	TAYEX - Taylor Expansion Equation Solver
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
8-462	INSTIN
8-463	Perpetual Calendar (BASIC Version)
8-464	TRØ2 Magnetic Tape Device Handler for PS/8
8-465	The SKED Software System

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
7-66	V5A Advanced Software System for the PDP-7
11-34	PALEDIT
11-38	PAL-11A (12K) Card Reader Assembler

II. TEXT EDITING, TEXT MANIPULATION

15-14	COPIER
15-19	FILNEX
15-20	PACKER
15-27	LPH.
15-33	EDITOR
11-23	BINFED/DOS Based Binary Module List/ Patch Program
11-33	EDITX
11-34	PALEDIT

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

15-32	SUBRG
15-34	Batch Mode DDT
11-22	DFPEEK/DOS Based Disk Inspect/Patch Routine
11-23	BINFED/DOS Based Binary Module List/ Patch Program
11-28	Extended ODT-11X

IV. BINARY LOADING, BINARY PUNCHING

11-21	CIOFB/DOS Based Overlay File Builder/ Editor (Version 3)
11-23	BINFED/DOS Based Binary Module List/ Patch Program
11-26	DSKSAV/DOS DISK SAVE/RESTORE
11-29	COPYTAPE
11-31	Binary Tape Interpreter/Address Scanner
11-32	MONUP - DOS Monitor Update Program

V. DUPLICATION, VERIFICATION

15-25	DUP
11-29	COPYTAPE
11-31	Binary Tape Interpreter/Address Scanner
11-39	"SUPER-DUPER" - (Fast PDP-11 DECtape Duplication Routine

VI. NUMERICAL FUNCTION, NUMERICAL INPUT/OUTPUT

9-73A&B	DECIN/DECOUT
15-17	Integer Square Root and Distance Routine
15-31	FFI
11-27	BIOF: BASIC Input/Output Function
11-30	ENCODE/DECODE for PDP-11 FORTRAN IV

VII. UTILITY

DECUS NO.	TITLE
15-21	File Compatibility Package - PDP-9/15 DECtape to PDP-11 DECtape
15-24	CONVRT
15-25	DUP
15-31	FFI
15-35	ACCDMP
11-21	CIOFB/DOS Based Overlay File Builder/ Editor (Version 3)
11-22	DFPEEK/DOS Based Disk Inspect/Patch Routine
11-25	File Compatibility Package PDP-9/15 DECtape to PDP-11 DECtape
11-26	DSKSAV/DOS DISK SAVE/RESTORE
11-29	COPYTAPE
11-31	Binary Tape Interpreter/Address Scanner
11-32	MONUP - DOS Monitor Update Program
11-35	COMBINE
11-36	Parity Subroutine

VIII. DISPLAY

9-75A&B	DRAW and DRAWDH
15-13	PLOTS - Data Plotting Routines for the VP-15A
15-22	PLOT Display Package
15-27	LPH.

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

15-21	File Compatibility Package - PDP-9/15 DECtape to PDP-11 DECtape
15-23	Industry Compatible Magtape Package
15-24	CONVRT
15-28	GPM Implementation
11-22	DFPEEK/DOS Based Disk Inspect/Patch Routine
11-23	BINFED/DOS Based Binary Module List/ Patch Program
11-25	File Compatibility Package PDP-9/15 DECtape to PDP-11 DECtape
11-27	BIOF: BASIC Input/Output Function

X. PROBABILITY, STATISTICS, CURVE FITTING

15-12	CURVES - Curve Fitting Routine for Polynomial and Exponential Functions

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

15-26	A PDP-9/PDP-15 Program for Radioactive Decay and Capture Chain Calculations

I. PROGRAMMING LANGUAGE, MONITOR, PROGRAMMING SYSTEM

DECUS NO.	TITLE
8-417	XCORE
8-431	8/I LAB Data System
8-433	Extensions to "LIBRA-FOCAL"
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
8-456A	PIP "AH"
8-456B	BUILD "AH"
8-465	The SKED Software System
FOCAL8-177	PS/8 FOCAL, 1971
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-45	FOCALP-FOCALPE
12-48	PS/8 FORTRAN Library Routines
12-54	QUIP - Quick Assembler for the PDP-12
L-109	MAXILIST and MAXIMETA
L-110	LINFOC or LINC-8 FOCAL
L-111	RNPL Disk Library

II. TEXT EDITING, TEXT MANIPULATION

8-407	Patch to Editor (DISK) DEC-D8-ESAD-PB
8-408	Disk Utility Program
8-413	GROPE III/A and BINLOC
8-423	Disk Editor With View for LAB-8
8-424	Morse Code
8-427	MEMO - A Text Formatting Program
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-454	Radio Teletype to ASCII
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
12-39	QUANAT 1
12-50	EDIT-12

III. DEBUGGING, DISASSEMBLY, SIMULATION, TRACE, DUMP

8-412	MRS X
8-417	XCORE
8-425	Block-Modify for PS/8
8-436	EAE - Simulator
8-440	PIPL
8-444	COREMAP
8-445	FYLHLP - PS/8 File Utility Program
8-448	CORDMP - Formatted Octal Dump
8-457	DTFIX

IV. BINARY LOADING, BINARY PUNCHING

8-408	Disk Utility Program
8-409	Card Loader
8-413	GROPE III/A and BINLOC
8-421	Chain Load
8-422	Binary Punch
8-448	CORDMP - Formatted Octal Dump
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
L-111	RNPL Disk Library

V. DUPLICATION, VERIFICATION

DECUS NO.	TITLE
8-408	Disk Utility Program
8-415	Multiple Unit DECtape Copier
8-438	DF-32/Sykes Swap
8-439	MOVE
8-440	PIPL

VI. NUMERICAL FUNCTION, NUMERICAL INPUT-OUTPUT

8-410	Pseudo-Random Number Generator, EAE Version
8-426	Prime Number Generator
8-428A	EAE - Modification to DECUS NO. 8-143, FFTS-R
8-428B	EAE - Modification to DECUS NO. 8-144, FFTS-C
8-432	Triple Precision Integer Package
8-436	EAE - Simulator
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-449D	Buffered I/O Subroutine for the PDP-8
8-452	ANSAM (Analog Sampling)
8-453	Rapid Alert Program (RAP)
FOCAL8-172	XPON
FOCAL8-174	SYNDIV 5
12-34	STAP-12
12-41	BLOOPD - Blood Pressure Display Program
L-114	Pseudo-Random Number Generator, EAE Version (See 8-410)

VII. UTILITY

8-413	GROPE III/A and BINLOC
8-414	LIST
8-435	RECOVER
8-436	EAE - Simulator
8-438	DF-32/Sykes Swap
8-439	MOVE
8-440	PIPL
8-441	DELETE
8-444	COREMAP
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-449C	TALK1Ø - A PDP-8/PDP-10 Utility-Loader
8-449D	Buffered I/O Subroutines for the PDP-8
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
12-56	QANDA+ - Modified QANDA Subroutine
12-57	SPY+ - Modified MAGSPY
12-58	FIFOCON

VIII. DISPLAY

DECUS NO.	TITLE
8-411	Mongoose Display System
8-416	Bibliographical Handling
8-418A&B	VEKSEL and PAPT
8-423	Disk Editor With View for LAB-8
8-442	"The BYU Boob Tube"
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-455	CRTPAC
12-33	KWANDA
12-37	ODCAD (Octal to Decimal Conversion and Display)
12-39	QUANAT 1
12-41	BLOOPD - Blood Pressure Display Program
12-51	MAGSPYD
12-57	SPY+ - Modified MAGSPY
L-112	FSUPLOT: X-Y Plotter Routine for GRAPHA
L-113	PDIS - A PDP-8 Routine to Access the LINCscope

IX. DATA MANAGEMENT, SYMBOL MANIPULATION, SORTING

8-117	A PDP-8 Interface for a Charged Particle Nuclear Physics Experiment
8-416	Bibliographical Handling
8-418A&B	VEKSEL and PAPT
8-427	MEMO - A Text Formatting Program
8-435	RECOVER
8-440	PIPL
8-441	DELETE
8-445	FYLHLP - PS/8 File Utility Program
8-449D	Buffered I/O Subroutines for the PDP-8
8-454	Radio Teletype to ASCII
8-457	DTFIX
8-460	TT89 - Tape Transfer PDP-8 to PDP-9
8-461	COPY1Ø - PDP-10 DECtape Program for the PDP-8
12-34	STAP-12
12-46	STRINGS
12-47	PIP-16ØØ

X. PROBABILITY, STATISTICS, CURVE FITTING

8-406	STATPAC Revisions for PDP-8/I and TSS/8
8-410	Pseudo-Random Number Generator, EAE Version
8-429	Intercorrelation 37
8-431	8/I LAB Data System
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time to Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
FOCAL8-170	Saint Peter's College Statistical Package
FOCAL8-171	Minnesota Sociology Statistics Programs
12-34	STAP-12
12-38A	Histogram and One-Factor Analysis of Variance
12-38B	Histogram and Two-Factor Analysis of Variance
L-114	Pseudo-Random Number Generator, EAE Version

XI. SCIENTIFIC APPLICATION, ENGINEERING APPLICATION

8-416	Bibliographical Handling
8-419	Nmr-Pulse for the Lab-8/I
8-420	LOGSIM-8
8-424	Morse Code
8-431	8/I LAB Data System
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine
8-446	A Patch to FFTS-R for Use Without the EAE
8-447	Roots of a Polynomial by Muller's Method
8-453	Rapid Alert Program (RAP)
8-459	TAYEX - Taylor Expansion Equation Solver
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
12-34	STAP-12
12-35	Bioelectric Signal Sorter (JULIA)
12-41	BLOOPD - Blood Pressure Display Program
12-43	PLOT3D
12-44	AVERDT
12-53	Liquid Scintillation Counting: Conversion of CPM to DPM in Double-label Experiments
12-55	FFAESIM
L-113	PDIS - A PDP-8 Routine to Access the LINCscope

XII. HARDWARE CONTROL

8-424	Morse Code
8-434	Data System for Magnetic Scanning Mass Spectrometers
8-434.1	SCAN (DC34) Data Acquisition Routine
8-434.2	STD (TM36) Automatic Reference Identification Routine
8-434.3	CONV (IR18) Interpolation (Time To Mass) Title
8-434.4	TIC (TI26) Total Ion Current Plot
8-434.5	TAB (PR33) Tabular Listing of Spectra
8-434.6	HIST (DP35) Histogram Plot of Spectra
8-434.7	TUNE (TU1) Tuning Routine

XII. HARDWARE CONTROL (Continued)

DECUS NO.	TITLE
8-449A	A Magtape Handler for the PDP-8/TU20
8-449B	LPTQUE - A PTØ8 to A. B. Dick Line Printer Utility Program
8-450	PS/8 Editor With Display for KV8/I (Overlay)
8-451	PS/8 Handler for KV/8 Vector Display
8-452	ANSAM (Analog Sampling)
8-455	CRTPAC
8-457	DTFIX
8-458	VW - Field Independent I/O Handler for Disk and TTY
8-464	TRØ2 Magnetic Tape Device Handler for PS/8
L-113	PDIS - A PDP-8 Routine to Access the LINCscope

XIII. GAME, DEMONSTRATION

8-424	Morse Code
8-426	Prime Number Generator
8-430	DECK: A Random Deck of Cards
8-437	Computer Dating Game
8-442	"The BYU Boob Tube"
8-462	INSTIN
8-463	Perpetual Calendar (BASIC Version)
FOCAL8-173	APOLLO II
12-36	Hangman for PDP-12

XIV. PLOTTING

8-416	Bibliographical Handling
12-42	CALCO12
12-59	FOCPLOT
L-112	FSUPLOT: X-Y Plotter Routine for GRAPHA

XV. DESK CALCULATOR, BUSINESS APPLICATION

8-453	Rapid Alert Program (RAP)

XVI. MAINTENANCE

8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
8-444	COREMAP

XVII. MISCELLANEOUS

8-443	Keyboard Test Tape for Hot Metal Linecaster with TTS
FOCAL8-178	Motion Picture Package
FOCAL8-179	Depth of Field Program for Still Camera Lenses
12-40	PDP-8 Disk Monitor - LAP6-DIAL Interface
12-49	Cold Start DF32 Disk Formatter for PS/8 on a PDP-12
12-52	Student Test Analysis
L-113	PDIS - A PDP-8 Routine to Access the LINCscope

DECUS NO. FOCAL8-165 (Continued)

measure of effectiveness of the experiment, is calculated.

Minimum Hardware: PDP-8
Source Language: FOCAL 8/68

DECUS NO. FOCAL8-166A & B

First and Second Order Partial Correlations

Dr. William Wilmot, Central Michigan University, Mt. Pleasant, Michigan

Program A computes the three first order partial correlations for three variables. User supplies the zero-order correlations between the three variables. In program B the user supplies the correlations between the four variables and the program calculates the second order partial correlations between the four variables.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-167

Five Statistical Programs for the PDP-8 or PDP-12

Stephen J. Mayor, Medical College of Ohio at Toledo, Toledo, Ohio

This package consists of five statistical programs. Since there is insufficient storage space for data if the programs are chained together and fed into a machine with only 4K of core, each tape may be ordered separately. However, if sufficient core is available, these programs may easily be chained together using FOCAL since none of the instructions in any of the programs occupy the same line number. The programs are: 1) Student's t Test; 2) Dunnett's t Test; 3) Normalized Plot Routine; 4) Mean and Standard Deviation; 5) Analysis of Variance for Single Variable of Classification.

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-168

One-Armed Bandit - PDP-8 Style

Frank R. Borger, Michael Reese Hospital, Chicago, Illinois

One-Armed Bandit lets the player operate the computer as a slot machine. The computer "spins the wheels," checks for wins, and keeps a total of the player's wins or losses. This is similar to DECUS NO. FOCAL8-95 and FOCAL8-127. DECUS would be interested in user feed-back as to which program is superior.

Minimum Hardware: 4K PDP-8, ASR33
Source Language: FOCAL

DECUS NO. FOCAL8-169

FOCAL Version of the GE Basic Artillery Game

Ronald A. Wong, Edmund Wong, 660-44th Avenue, San Francisco, California

In most computer games the situation is the player versus the computer. However, in this game, the computer is just measuring the skill of the player -- by testing his ability with an artillery piece in coming within 100 yards of a target, whose distance was randomly selected.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69 with extended functions
Source Language: FOCAL-69

DECUS NO. FOCAL8-170

Saint Peter's College Statistical Package

Professor Robert W. Carter, Saint Peter's College, Jersey City, New Jersey

This package contains 8 programs for statistical analysis with FOCAL. The tape for each application may be ordered separately or the complete package may be ordered as one unit. All write-ups are included in one document. The programs and their applications are as follows:

FOCAL8-170.1 FLGPLT - Plots scaled frequency distributions
" .2 FLBIND - Computes binomial probability Distributions
" .3 FLPCTL - Computes percentile scores
" .4 FLSDEV - Computes means and related measures
" .5 FLHMES - Computes "H," the information measure of noise
" .6 FLTMES - Computes "T," the information measure of relationship
" .7 FLPEAR - Computes a Pearson linear correlation and regression analysis
" .8 FLSPER - Computes Spearman's rank-order correlation coefficient

Minimum Hardware: 4K PDP-8
Source Language: FOCAL-69

DECUS NO. FOCAL8-171

Minnesota Sociology Statistics Programs

Philip M. Voxland, Department of Sociology, University of Minnesota, Minneapolis, Minnesota

The program package consists of a series of small statistical analysis programs of interest to behavioral science researchers. Various parametric and non-parametric statistics are calculated for nominal, ordinal, interval, and ratio level measurements, for discrete and continuous data and for raw data, grouped data and tabular data.

Minimum Hardware: 4K PDP-8
Other Programs Needed: FOCAL-69
Source Language: FOCAL 69

DECUS NO. FOCAL8-172

XPON

David A. Moon, Wayland High School, Wayland, Massachusetts

The purpose of XPON is to calculate integer powers of positive integers with more than the usual seven digits of precision in FOCAL. As the result is computed, it is divided into groups of five digits. Each group occupies a FOCAL variable. The method of exponentiation is repeated multiplication.

Restrictions:	The base and the exponent must both be integers
Source Language:	FOCAL

DECUS NO. FOCAL8-173

APOLLO II

David A. Moon, Wayland High School, Wayland, Massachusetts

This is a greatly improved version of the Apollo simulation game which has been running on almost every timesharing system in the country. The user is pilot of a lunar module, which he can steer in two axes. It is free to move up and down, and parallel to the lunar surface. The user must control attitude thrusters and the descent engine by typing in numbers. The program reports time, range to landing site, attitude, velocity components, fuel reserves, etc. every 5 seconds of simulated time. A small random error is introduced into these figures to simulate real conditions. After the module reaches the lunar surface, the program reports on its condition and makes remarks about the pilot's skill. This version of Apollo has been found to be considerably more challenging than the version which permits only vertical motion, since there are far more variables to control.

Minimum Hardware:	PDP-8 with Disk (must be able to run LIBRA)
Other Programs Needed:	FOCAL-69 (DEC-08-AJAE), LIBRA (DEC-08-AJ5E or DEC-08-AJ6E)
Storage Requirement:	Two library blocks (1400 words)
Source Language:	FOCAL-69, LIBRA

DECUS NO. FOCAL8-174

SYNDIV 5

David A. Moon, Wayland High School, Wayland, Massachusetts

SYNDIV 5 permits synthetic division of m-polynomial by n-polynomial. The user is requested to type in the coefficients of two polynomials. The first is divided by the second, and the coefficients of the quotient and remainder are printed. On input or output the "*X↑n" associated with the coefficient is supplied by the program. The degrees of both the dividend and the divisor may be from 1 to 9 with the extended functions still in core. A translation into a dialect of APL is included.

Minimum Hardware:	4K PDP-8
Source Language:	FOCAL

DECUS NO. FOCAL8-175

Modifications and Supplement to FOCAL8-50
RC Filter Design and Plot and 3-Pole Butterworth Filters

G. Chase, Portsmouth Abbey School, Portsmouth, Rhode Island

As in FOCAL8-50, the filter design and plot portion of this program are separate parts - a computation program and a graphing program. The computation program allows: a) speedier execution, b) format, c) self reinitialization, which allows several passes at a design. The modifications to the graph program consist of: a) removal of a bug, b) format, c) simplification of coding. These two parts cannot both fit into FOCAL's user area and hence must be used one at a time. The 3-Pole Butterworth Filters portion of the program scales the normalized designs by Kerwin in Huelsman's Active Filters (McGraw-Hill, 1970) to meet the parameters of the user.

Minimum Hardware:	4K PDP-8 and TTY
Other Programs Needed:	FOCAL, 1969 with extended functions
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-176

Program for Producing Histograms from Clinical Data on Teletype

Eddy Emons, Royal Postgraduate Medical School, Hammersmith Hospital, London, England

This program uses data from the Hypertension Clinic, which are blood pressure measurements taken from patients in the lying and upright positions respectively. Both the systolic (upper) and the diastolic (lower) pressures are recorded for each position.

FOCAL is used with all the extended functions erased. The data are recorded with the high speed reader and stored in a two dimensional array in field one via the integer overlay FNEW. For each pressure measurement, the mean and standard deviation are computed.

From the two dimensional array stored in field one another two dimensional array is computed and stored in field zero, representing the histogram data. FOCAL then scans through each array and types the histogram on the teletype.

Minimum Hardware:	8K PDP-8/I, high speed reader
Other Programs Needed:	FNEW integer overlay
Storage Requirement:	Program: 515 locations; data field one: 3900; field 0: 566 locations
Restrictions:	Extended functions are deleted
Source Language:	FOCAL-69

DECUS NO. FOCAL8-177

PS/8 FOCAL, 1971

David Schneider and Barry Smith
Submitted by: Hartwell H. Whitney, Jr., Oregon Museum of Science and Industry, Portland, Oregon

PS/8 FOCAL, 1971 is a modified version of FOCAL, 1969 for use with PS/8. It provides device-independent library commands, data file manipulations, recursive subroutine calls and chaining to other programs, character manipulations, computed line numbers, and other features.

Minimum Hardware:	PS/8, 8K and mass storage device, 64K disk or DECtape
Other Programs Needed:	PS/8
Source Language:	PAL-8

DECUS NO. FOCAL8-178

Motion Picture Package

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

This is a package of six short FOCAL routines which should prove useful to those in the motion picture industry. It consists of: 1) 16 mm Motion Picture Theater Optimization, 2) Motion Picture Scaling Program for Special Effects, 3) Running Time Program for Professional Motion Picture Films, 4) Movie Theater Lens Selection Program, 5) Cine Lens Depth of Field and Hyperfocal Calculations, 6) Footage-to-Time Conversion Program for 16 mm, 35 mm and 65/70 mm Cine Films.

Minimum Hardware:	4K PDP-8 with TTY, or any configuration equipped for FOCAL
Storage Requirement:	4K
Source Language:	FOCAL, 1969

DECUS NO. FOCAL8-179

Depth of Field Program for Still Camera Lenses

Stephen A. Kallis, Jr., Digital Equipment Corporation, Maynard, Massachusetts

In order to insure sharp focus in their photographs, amateur and professional photographers need to determine the depth of field of their lenses for particular settings. This program is based upon the assumption that an acceptable circle of confusion has a constant relation to the lens EFL.

Minimum Hardware:	4K PDP-8 with TTY
Source Language:	FOCAL, 1969

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
FOCAL8-125a	X		X	X				
FOCAL8-126	X		X	X				
FOCAL8-127	X	X		X				
FOCAL8-128	X		X	X				
FOCAL8-129	X		X					
FOCAL8-130	X		X	X				
FOCAL8-131	X		X	X				
FOCAL8-132	X		X	X				
FOCAL8-134	X	X		X				
FOCAL8-135	X	X		X				
FOCAL8-136	X	X						
FOCAL8-137	X		X					
FOCAL8-138	X		X	X				
FOCAL8-139	X	X		X				
FOCAL8-141	X	X	X	X				
FOCAL8-142	X		X	X				
FOCAL8-143	X		X	X				
FOCAL8-144	X				X			
FOCAL8-145	X			XX	X			
FOCAL8-146	X		X	X				
FOCAL8-147	X		X					
FOCAL8-148A&B	X	X						
FOCAL8-149	X		X					
FOCAL8-150	X	X	X	X				
FOCAL8-151	X		X	X				
FOCAL8-152	X		X	X				
FOCAL8-153	X	X		X				
FOCAL8-154	X	X	X	XX				
FOCAL8-155	X		X					
FOCAL8-156	X		X	X				
FOCAL8-157	X	X		X				

* X - Listing with write-up XX - Listing available at a handling charge

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
FOCAL8-158	X		X	X				
FOCAL8-159 A&B	X			X				
FOCAL8-160	X		X	X				
FOCAL8-161	X		X	X				
FOCAL8-162	X	X	X	X				
FOCAL8-163	X		X					
FOCAL8-164	X	X		X				
FOCAL8-165	X		X	X				
FOCAL8-166	X	X		X				
FOCAL8-167	X		X	X				
FOCAL8-168	X		X	X				
FOCAL8-169	X		X					
FOCAL8-170.1	X		X					
FOCAL8-170.2	X		X					
FOCAL8-170.3	X		X					
FOCAL8-170.4	X		X					
FOCAL8-170.5	X		X	X				
FOCAL8-170.6	X		X					
FOCAL8-170.7	X		X					
FOCAL8-170.8	X		X					
FOCAL8-171	X		X					
FOCAL8-172	X		X					
FOCAL8-173	X		X					
FOCAL8-174	X		X					
FOCAL8-175	X		X					
FOCAL8-176	X	X	X	XX				
FOCAL8-177	X	X		XX	X			
FOCAL8-178	X		X					
FOCAL8-179	X		X					

* X - Listing with write-up XX - Listing available at a handling charge

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
FOCAL8-136	FOCAL - Amity
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
FOCAL8-148	FOCL.S, An Expanded Language for Small Computers, Based on FOCAL
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
FOCAL8-160	Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test

DECUS NO.	TITLE
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

DECUS NO. L-102

OCDISMEM

Joseph DiSaverio, Drexel University, Philadelphia, Pennsylvania

OCDISMEM displays the octal values of the contents of core. The program will display from 1 to 5 columns, each consisting of 10_8 rows. Typing F or B will cause the display to go forward or backward a page.

Minimum Hardware: 4K LINC-8
Other Programs Needed: PROGOFOP
Source Language: LAP6

DECUS NO. L-103

RNPL SEARCH System

C. C. Wilton-Davies, Royal Naval Physiological Laboratory, Hants, England

Information storage and retrieval using LAP6 manuscripts up to 400 blocks long - an extension of FIND 1 (DECUS NO. L-53a). About 1000 references are present on the tape, most of them in the second 1000_8 blocks.

Minimum Hardware: 4K LINC-8
Other Programs Needed: DECUS NO. L-53a and DECUS NO. L-54
Restrictions: 1. This version of LAP6 will not deal with binaries. 2. A PDP-12 will only access half the tape
Source Language: LAP6

DECUS NO. L-104A

JIH (Joint Interval Histogram)

Dr. Peter Finkenzeller, University of Erlangen, Nurnberg, Germany
Submitted by: Robert DiMeo, Digital Equipment Corporation, Maynard, Massachusetts

This is the German version of the Joint Interval Histogram program. Both the documentation and the comments on the listing are written in German. See L-104B for description of program.

DECUS NO. L-104B

JIHE - Joint Interval Histogram (English Version)

Dr. Peter Finkenzeller, University of Erlangen, Nurnberg, Germany
Submitted by: Robert DiMeo, Digital Equipment Corporation, Maynard, Massachusetts

The program JIHE forms from a given sequence of pulses (spikes) on-line a joint interval histogram. Timing of the total histogram may be varied between 0.01 and 2.55 seconds and presetting of the number of pulses to be analysed is possible. In addition an interval histogram is calculated and simultaneously displayed with the joint interval histogram. Possibilities for scaling both histograms are provided. The results may be stored on tape. All instructions to the program are given by teletype to allow remote operation. JIHE needs only the standard equipment of the LINC-8 as timing is accomplished by the internal clock of the computer.

Minimum Hardware: LINC-8
Source Language: LAP6

DECUS NO. L-105

INVEN: Creation and Storage of an Inventory

A. Thomas DeWoskin, University of Michigan, Ann Arbor, Michigan

This program creates and stores on magnetic tape an alphabetically ordered inventory. INVEN allows for the creation of an initial inventory and its continual updating via input from the keyboard. One can increase or decrease the amount of an item already in the inventory, delete old items, or add new ones. The program inserts the new items into the inventory alphabetically. The updated inventory can be viewed on the screen with a moving window display or printed out on the teletype. The capacity of the inventory is 127 items. Full instructions are contained in a separate manuscript, INVENHOW.

Minimum Hardware: LINC or LINC-8
Storage Requirement: 2K in core, tape blocks 274-277
Source Language: LAP6

DECUS NO. L-106

Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8

Paul F. Sullivan, Cornell Aeronautical Laboratory, Inc., Buffalo, New York

This document describes a hardware modification to the PDP-8 or LINC-8 which protects software from obsolescence caused by the addition of new devices to the interrupt and/or data break facilities and allows significant savings of money and effort in interfacing further devices to the computer. The hardware also provides the computer with a dynamic priority interrupt facility.

DECUS NO. L-107

Digital 8-12-U Modified

Judson Gilbert, Florida State University, Tallahassee, Florida

See DECUS NO. 8-367

DECUS NO. L-108

PROFPP

D. A. Wycoff, University of Iowa, Iowa City, Iowa

PROFPP is a new version of PROGOFOP supplied on a LAP6A-3L LINCtape. Either the standard PROGOFOP Version II, or two different versions of PROFPP may be selected at the time the LOAD toggle is raised. At the same time the user may select upper and lower memory banks and whether to call LAP6 or the RIM and BIN loaders into memory.

PROFPP is designed to permit incorporating standard PDP-8 floating point routines within LINC programs. All five PDP-8 floating point packages have been placed on magnetic tape and filed in the LAP6 index. PROFPP provides direct interpretation of all LAP6 characters from the teletype and addresses tape blocks 1000-1777 via the EXC class instructions. The Keyboard/Reader flag control has been improved so that the paper tape reader pauses during magnetic tape operations or whenever the LINC halts. Provision for calling LINC subroutines from within PDP-8 subroutines is included as well as the capability of setting the LINC program counter from the console (JMP instructions with the DO toggle). A second version, PROFPP B, (buffered) is included which provides a 10 character buffer for teletype input which may be expanded by the user into any memory area.

The provided marking program (MARKTAPE) marks blocks 0-1777 and corrects the failure to check blocks above 777 seen in other programs written for this purpose.

Source Language: PAL III.5 and LAP6

DECUS NO. L-109

MAXILIST AND MAXIMETA

D. A. Wycoff, University of Iowa, Iowa City, Iowa

MAXILIST and MAXIMETA allow the user to compile a list of LAP6 meta commands to be executed in sequence under program control. The "LI" and "PM" commands are most valuable and are handled by both programs, while with MAXIMETA other meta commands can also be handled.

Minimum Hardware: Basic LINC-8
Other Programs Needed: PROFPP (DECUS NO. L-108, same tape), LAP6A-3L
Source Language: LAP6

DECUS NO. L-110

LINFOC or LINC-8 FOCAL

Alan Cleary, University of Newcastle Upon Tyne, Newcastle Upon Tyne, England

This version of DEC FOCAL has been developed for the LINC-8 computer. LINFOC incorporates functions to operate the LINCscope, read the ADC's and external level lines and load the relay register. An improved pseudorandom number generator has been incorporated and new functions give single character input/output and read the right switch register. Versions incorporating common data storage functions are available, in which data may be stored on LINCtape and swapped between programs. A new command, OPERATE, is included which simplifies the formulation of statements to operate the LINCscope, relay register and common data storage functions.

LINFOC is slow but powerful and well behaved. It is particularly useful for introducing students to on-line computing and for analysing data which can be filed by the LINC-8 Library System.

Minimum Hardware: LINC-8
Other Programs Needed: LINC-8 Library System
Source Language: PAL III

DECUS NO. L-111

RNPL Disk Library

C. C. Wilton-Davies, Royal Naval Physiological Laboratory, Alverstoke, Gosport, Hants, England

Of the 44 programs on the tape, the three most important provide for the transfer of complete DF32 disk images between disk and LINCtape Unit 1. "DMARK" marks LINCtapes in 129-word blocks to hold six complete DF32 images on one tape. "DUMP" transfers the DF32 image to a specified section of the tape, and "LIFT" is the converse.

Minimum Hardware: LINC-8 with DF32 (or RF08 Disk if modified)
Storage Requirement: 4K
Restrictions: Not applicable to PDP-12
Source Language: PAL III

DECUS NO. L-112

FSUPLOT: X-Y Plotter Routine for GRAPHA

H. V. Campbell and D. C. Bergen, Florida State University, Tallahassee, Florida

This is a plotter routine for the GRAPHA program using an X-Y plotter interfaced to a 4K LINC-8 as described in DECUS NO. L-77 (Extended PROGOFOP). In addition GRAPHA has been made compatible with LAP6-3L.

Minimum Hardware: 4K LINC-8, X-Y Plotter, ASR33
Other Programs Needed: DECUS NO. L-77
Restrictions: Must implement minor hardware additions per L-77
Source Language: LAP6

DECUS NO. L-113

PDIS - A PDP-8 Routine to Access the LINCscope

Peter Lemkin, National Institutes of Health, Bethesda, Maryland

PDIS is a subroutine for the LINC-8 computer used to access the LINC CPU's point display hardware from the PDP-8 CPU.

DECUS NO. L-113 (Continued)

This greatly facilitates incorporating the LINCscope in PDP-8 programs.

Minimum Hardware:	LINC-8
Storage Requirement:	1 page
Restrictions:	Must reside in current instruction bank
Source Language:	PAL

DECUS NO. L-114

Pseudo-Random Number Generator, EAE Version

SEE DECUS NO. 8-410

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
L-81	X			X				
L-82	X	X	X	X				
L-84	X			X				
L-85	X			X				
L-87	X							
L-88	X	X	X	X				
L-89	X							
L-90	X							
L-91	X							
L-92	X			XX				
L-93	X			XX				
L-94	X	X		X				
L-95	X			X				
L-96	X			X				
L-97	X	X	X	XX				
L-98A	X			XX				
L-98B	X			XX				
L-99A	X			XX				
L-99B	X			XX				
L-100	X			XX				
L-101	X			X				
L-102	X			XX				
L-103	X							
L-104A	X			XX				
L-104B	X			XX				
L-105	X			X				
L-106	X							
L-107	X		X	X				
L-108	X			X		X		
L-109	X					X		
L-110	X			XX		X		

* X - Listing with write-up XX - Listing available at a handling charge

DECUS PROGRAM AVAILABILITY

Reference list of materials available from the DECUS Program Library and Publications Department

DECUS NO.	WRITE-UP	PAPER TAPE		LISTING *	DECTAPE	LINCTAPE	MAGTAPE	CARD DECK
		BIN	ASCII					
L-111	$ X	$	$	$	$	$ X	$	$
L-112	X			X		X		
L-113	X			X		X		
L-114	X			X				

* X - Listing with write-up XX - Listing available at a handling charge

LINC-8 NUMERICAL INDEX

DECUS NO.	TITLE
L-74	NIM
L-75	Obsolete
L-76	Modifications to PROGOFOP II
L-77	Extended PROGOFOP to Drive An Inexpensive X-Y Plotter
L-78	XY Plotter Maintenance Programs, XYSET and XYTEST
L-79	MARK L8A (Adapted MARK L8)
L-80	Obsolete
L-81	FOCDAT
L-82	Root Solver - Real Coefficients
L-83	Obsolete
L-84	SEPAN/Sequential Pattern Analysis
L-85	DTP-1 Real-Time Clock
L-86	Obsolete (See L-108)
L-87	SNOOPY Display Program for the LINC-8
L-88	TAPE
L-89	ECGAV8
L-90	TDIST
L-91	PROG 2
L-92	SPKDET
L-93	INTERP
L-94	*TAPMARK
L-95	FAILDIS
L-96	SIGAVE1, SIGAVE2, SIGAVE3, SIGAVE4 and EVRANA
L-97	FOCLTP
L-98A & B	REDROOT and REDROOTM
L-99A & B	CON2PTS/TSTCON
L-100	LEAP or 8-Library Index Printer
L-101	MUL-2REG
L-102	OCDISMEM
L-103	RNPL SEARCH System
L-104A	JIH (Joint Interval Histogram)
L-104B	JIHE - Joint Interval Histogram (English Version)
L-105	INVEN: Creation and Storage of an Inventory
L-106	Radial Interface Including Interrupt Mask for the PDP-8 or LINC-8
L-107	Digital 8-12-U Modified
L-108	PROFPP
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L-111	RNPL Disk Library
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L-113	PDIS - A PDP-8 Routine to Access the LINCscope
L-114	Pseudo-Random Number Generator, EAE Version

SEE ALSO

FOCAL8-6	FOCAL-8 Patch for LINC-8 Display
FOCAL8-10	Patch to FOCAL W for LINC-8 A-D Converter
FOCAL8-53	JMPFOCAL: FOCAL as a LINC-8 Subroutine
FOCAL8-58	A Patch to FOCAL W to use the LINC-8 Display