DECUS

PROGRAM LIBRARY
PDP-8 CATALOG

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
AUGUST 1978

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This is a complete PDP-8 DECUS Library Catalog. It includes a complete listing of current PDP-8, BASIC-8, and FOCAL-8 DECUS programs.

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DECsystem-10	FLIP CHIP	OS-8	TYPESET-11
DECSYSTEM-20			UNIBUS

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Section 1
General Information

Section 1
General Information

1.1 How to Use this Catalog

1.1.1 Content of Each Section

- Section 1, *General Information*, provides details about ordering, payment, who to contact within DECUS, policy on returns, and other policy and procedural information.
- Section 2, *Abstracts*, is sub-divided into three parts, PDP-8, Basic-8 and FOCAL-8 including program descriptions and respective Media/Price Codes in sequential order by DECUS Order Number.
  Note: It is essential to designate the applicable Section when ordering from the Catalog, e.g. order "FOCAL-8-123" or "PDP-8-123."
- Section 3, *Standards*, lists and describes Digital Equipment Corporation Software Standards and other documentation related to standards such as programming conventions and guidelines available through DECUS.
- Section 4, *Indexes*, contains three indexes; the Alphabetical Index lists all programs alphabetically by title, the Category Index lists all programs by program type (see first page of index for list of categories), and the Operating System Index lists programs by operating system (see first page of index for list of systems.)

1.1.2 New and Revised Programs

- New programs included in this issue:
  8-856 thru 8-880
  BASIC8-92 thru BASIC8-104
  FOCAL8-337 thru FOCAL8-338
- Revised or updated programs since the last catalog:
  8-721 LISP-8K
  8-738 Business Management Laboratory
  8-754 NUMBER and REDATE OS/8 Utilities
  8-802 Scientific Subroutine Package
  8-825 ALPHA and CCL40A
  8-842 DIRECT: OS/8 Directory Listing
  BASIC8-43 NEOPAL: PAL-D Simulator
  FOCAL8-252 12K FOCAL Overlay

1.1.3 Editor's Note

- This catolog represents a significant departure from earlier PDP-8 DECUS Library Catalogs in that it represents the first pass at a comprehensive review of the PDP-8 Library.
- This catalog includes most programs from the previous PDP-8 catalogs, Volume I and Volume II, that were submitted and/or revised since 1973. A number of programs, however, were omited from this issue because they were considered obsolete, had ambiguous hardware/sofware prerequisites, or for various other reasons. In many cases, arbitrary decisions were made because time did not permit a thorough investigation of the integrity of some of the programs.
  We welcome comments from users regarding programs that should be enhanced, withdrawn, or that should not have been withdrawn from this issue.
- Many PDP-8 DECUS programs are now available for the first time on floppy diskettes and additional programs will be offered on this medium in the future. Information on this and other new or revised programs is published periodically in the DECUS 12-Bit SIG Newsletter and in DECUSCOPE.
- The DECUS Library Staff wishes to express appreciation to the many authors who have submitted new or revised programs and to the many other individuals who contributed their time to improving the PDP-8 Library.

1.1.4 General Catalog Information

- The DECUS Library requests that all inquires concerning DECUS programs be communicated in writing and forwarded to the DECUS Marlboro office, not to the authors/submitters. DECUS will request assistance from the responsible author/submitter, assuming they are available.
- Requests for multiple catalogs will be honored but a nominal service charge will apply. Contact your Chapter office if you require additinal catalogs.

1.2 Where to Order Library Programs and Obtain Information

1.2.1 United States and Canada

To place Library orders and to obtain information, users residing in an area outside the definition of the European or Australian Chapters (see Section 1.2.2), should deal directly with the DECUS Library at the following address:

DECUS Library
MR2/E55
One Iron Way
Marlboro, MA 01752
(Telephone: (617)481-9511)

To obtain information on:

- PDP-8 DECUS Library, contact the PDP-8 Library Administrator, (X4178)
- Standards, contact the Standards Librarian, (X4178)
- Service charges, order status, shipping information, contact the DECUS Order Desk, (X4135)
- Payments and billing, contact the DECUS Accounting Coordinator, (X4136)
- DECUSCOPE, (X4161)
- U.S. Symposia Information, (X4142)
- Membership, (X4167)
- Proceedings, (X4161)

In Canada, for DECUS information:

DECUS Canada
P.O. Box 11500
Ottawa, Ontario
K2H 8K8
Canada
(Telephone (613)592-5111)

1.2.2 Outside the United States and Canada

To place DECUS Library orders, for clarification of policies or procedures on currency exchange information, order status, shipping information, handling charge information and for questions concerning payment and billing outside the U.S. or Canada, contact your local Chapter Office:

In Austrialia and New Zealand:

DECUS Australia
P.O. Box 491
Crows Nest
N.S.W. 2065
Australia
(Telephone (61)-(2)-4392566)

In Europe and Middle East:

DECUS Europe
12, av. des Morgines
1213 Petit-Lancy 1
Geneva, Switzerland
(Telephone (022)93-33-11)

1.3 Payment

All DECUS service charges are to defray the cost of media, reproduction, handling, and postage. All Orders must be accompanied by check, DECUS coupons, or a purchase order. PLEASE DO NOT SEND CASH THROUGH THE MAIL. Please make purchase orders and checks payable to DECUS. DECUS order processing and accounting functions are completely separate from the Corporation. Do not combine DECUS orders with Digital Equipment Corporation orders.

Please do not request that DIGITAL field personnel place a DECUS order for you. This may delay direct response from DECUS.

All service changes quoted in this catalog are in U.S. Dollars. A $2.00 invoice charge is added to all orders that are not prepaid. (This charge is subject to change without notice.)

Users outside the United States and Canada should make payment in local currency and forward it to the local Chapter office. Overseas users should allow a minimum of eight weeks for delivery.

Users in the United States and Canada should make payment in U.S. dollars to DECUS and forward it to Marlboro. In the U.S., please allow three to six weeks for delivery. In Canada, allow approximately six weeks for delivery.

1.4 DECUS Coupons

Because of the difficulties encountered by many installations in obtaining purchase orders for small amounts, DECUS coupons may be ordered for any amount and used as subsequent payment for DECUS orders. Coupons are available from your DECUS Chapter office. They are supplied in $1, $5, and $10 denominations as DECUS No. 0051. Payment for DECUS coupons must be made in ADVANCE. Purchase orders for coupons must be paid before coupons may be redeemed for DECUS material. DECUS coupons may not be used as payment for DECUS symposia fees.

1.5 Return Policy

Tapes may not be returned for credit. It is therefore important that the correct media be specified at the time the order is placed. For further information, see the Program Distribution Methods section of this catalog (Section 1.8).

The DECUS Library reproduces user programs and documentation and distributes them essentially at cost. Occasionally, the medium or copying procedure may be faulty and flawed copies may be inadvertantly distributed. DECUS is working to minimize these problems and encourages users to return faulty copies so that the source of the error may be traced. Accordingly, the following policies have been established to serve as guidelines:

- Any copy of a DECUS Library program that is unreadable on the distributed medium will be replaced by DECUS at no charge if returned, with a written explanation, within 60 days of receipt. This includes orders which are filled incorrectly by DECUS staff (e.g., wrong program), copied incorrectly, or copied to flawed medium.
- Users who specify the wrong program, media, or format on their order form must bear the cost of reordering.
- Neither refunds nor exchanges will be granted for programs which were copied correctly but which do not fulfill the user's needs. Conversion of sources or media format for use on different

computers or different operating systems is the responsibility of the person ordering or receiving the item. Please note that most media formats are not compatible with all operating systems. DECUS would appreciate being informed if users consider a program abstract (in the catalog) to be misleading.

- Refunds (in cash or DECUS coupons) will not be issued under any circumstance.

1.6 Documentation

"A" and "D" coded documents (see Section 1.7.1 for code definitions) are distributed automatically with no additional charge for individual programs when the program tape is ordered.

Manuals, designated by an "E" code with an abstract, are not distributed automatically. A service charge will apply whether or not the program tape or disk is ordered.

Documentation may be requested without media. A service charge as indicated by the media price code that accompanies the abstract will apply.

1.7 Media/Price Codes

The media/price codes are alpha-numeric. The letter indicates the medium on which the product can be supplied (see following table). The number(s) specify the actual service charge for the item in U.S. dollar currency. For example: H32 indicates a program available on DECtape at a service charge of $32.00.

1.7.1 Media Codes Table

A	Write-up	J	LINCtape
B	Listing	K	Floppy Diskette
C	Microfiche	L	Cassette
D	Write-up and Listing	M	Magtape 600'
E	Manuals	N	Magtape 1200'
F	Binary Paper Tape	P	Magtape 2400'
G	ASCII Paper Tape	Q	RK05 Disk
H	DECTAPE	R	Card Deck

1.7.2 User Media

Due to recurring problems with user supplied media, the DECUS Program Library no longer accepts orders to copy programs onto user tapes and disks.

1.7.3 Service Charge Policy

Although Library service charges quoted in this catalog are expected to be valid until 1 July 1979, they are subject to change at any time. Users are encourged to read DECUSCOPE and appropriate DECUS Newsletters to stay informed on any changes in Library policy and program availablility.

1.8 Distribution Methods

1.8.1 Program Packaging

Programs in the DECUS PDP-8 Library may be obtained:

- As individual programs on paper tape, DECtape, floppy diskette, or RK05 disk pack. If a program is not specified on the media you require, please contact the DECUS Library *before* ordering to determine whether the Library can copy the program onto the media that you require.
- As Library Packages which are complete segments of the Library packed onto magnetic media. Library packages currently available are listed in Section 1.8.2.

Questions, comments, suggestions, or users wishing to assist DECUS in the development of new

PDP-8 Library Packages should contact DECUS at the following address:

PDP-8 Libray Administrator
DECUS Library
MR2/E55
One Iron Way
Marlboro, MA 01752

Note: DECUS does not have the facilities at this time to custom pack multiple programs onto magnetic media.

1.8.2 Special Library Packages

DECUS No: **FOCAL-LIB-1**
One floppy diskette containing programs listed in the current catalog for FOCAL8-5 through FOCAL8-124, with the exception of FOCAL8-52.
Media/Price Code: *K75* (*with documentation*)
Documentation only: *A50*

DECUS No.:**FOCAL-LIB-2**
One floppy diskette containing programs listed in the current catalog from FOCAL8-126 through FOCAL8-236, with the exception of FOCAL8-182, 216, 223, 224, 225, 226, 227, 229, 230, and 231.
Media/Price Code: *K60* (*with documentation*)
Documentation only: *A35*

The Floppy diskettes may be obtained without documentation for a service charge of $27.00 each.

1.9 Cross-System Index

An index of most DECUS Library programs that are written in higher level languages (includes the 12-bit, PDP-11, RSTS-11, and DEC-10/20 libraries) is available from the DECUS Library for $5.00 U.S. currency. The program languages included are APL, ALGOL, BASIC, COBOL, DIBOL, FOCAL, FORTRAN, LISP, PL/I, SNOBOL, and TECO.

The programs are listed alphabetically by language, program title, and subject keywords. This index provides an easy reference guide for users who are looking for programs for particular applications.

Note: The Cross-System Index does not include program abstracts or media/price information. To order this index, order DECUS number 11-999.

Section 2
Abstracts

Section 2.1
PDP-8 ABSTRACTS

Disassembler with Symbols **8-18**
Author: Eberhard Werner,
University of California, Marine Physical Laboratory of the Scripps Institution of Oceanography, San Diego, CA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: EAE

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

Media Price Code: A2, B3, F5, G22

Random Number Generator for the PDP-5/8 **8-25**
Author: Paul T. Brady,
Bell Laboratories, Holmdel, NJ
Source Language: PAL-III

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

Media Price Code: D2, F5

A Program to Relocate and Pack Programs in Binary Format **8-32**
Author: J. W. Bowman,
Atomic Energy of Canada Ltd., Chalk River, Ontario, Canada
Operating System: Paper Tape
Source Language: PAL-III

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

Media Price Code: D2, F5

One Pass PAL-III **8-84**
Author: Krause and Riedl,
Siemens, Erlangen, Germany
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 8K

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

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

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

Note: The version of PAL-III listed above is no longer available.

Media Price Code: D1, G5

XOD: Extended Octal Debugging Program **8-89**
Author: Michael S. Wolfberg,
Massachusetts Computer Associates, Wakefield, MA
Operating System: Paper Tape
Source Language: PAL

Abstract: XOD is an octal debugging program for a PDP-8 with extended memory which preserves the status of program interrupt system at breakpoint. The program occupies locations 6430 through 7577 of any memory field.
XOD includes an elaborate breakpoint facility to help the user run sections of his program. When this facility is used, the debugger also uses locations 0005, 0006 and 0007 of every memory field. (See DECUS NO. FOCAL8-2.)

Restrictions: The ability to punch binary tapes is not included in XOD. XOD may require modification for use with a parity terminal.

Media Price Code: A2, B2, F5, G10

MICRO-8 On-Line Assembler **8-91**
Author: K. F. Kinsey and M. E. Nordbert
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 3200–4200

Abstract: MICRO-8 is a short assembler program for the PDP-8 that translates typed mnemonic instructions into the appropriate binary code and places them in specified memory locations immediately ready to function. It processes the typed instructions by a table-lookup procedure.
It is especially useful for programs of less than one page which are to be run immediately. Only octal (not symbolic) addresses may be specified, but the user has control of the zero page and indirect addressing bits. An octal typeout routine permits examination of any memory location.

Note: MICRO-8 is quite capable of modifying itself.

No source available.

Media Price Code: A2, F5

LISP Interpreter for the PDP-8 **8-102**
Author: Dr. G. van der Mey and Dr. W. L. van der Poel,
Technical University of Delft, The Netherlands
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: High Speed Reader

8-102 (Cont.)

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

Restrictions: See also 8-628. The listing is not commented in English.

Media Price Code: A2, B10, F6

Four Word Floating Point Routines **8-103**

Author: D. A. Dalby, D. E. Wells, and C. K. Ross, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada
Source Language: PAL-III
Memory Required: 4K

Abstract: This program package was written for use with Digital's Four Word floating Point Package (DEC-08-FMHA). Included are an extended function package, a rudimentary calculator, floating point output controller with rounding, and additional instructions for the floating point interpreter.

Extended functions include square root, sine, cosine, arctangent, natural logarithm, and exponential functions.

Note: It is not known whether this package is compatable with the current DEC Floating Point Packages.

Media Price Code: D5, F8, G34

SNAP: Simplified Numerical Analysis **8-122A**

Author: Developed at Harvard Medical School under an NIH grant.
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

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

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

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

Note: Both EAE and non-EAE versions are included in write-up for 8-122A

No source available.

Media Price Code: A2, F5

SNAP: Simplified Numerical Analysis for use with EAE **8-122B**

Author: Developed at Harvard Medical School under an NIH grant.
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: Same as 8-122A.

No source available.

Media Price Code: A2, F5

XDDT Extended Octal-Symbolic Debugging Program **8-127**

Author: Michael S. Wolfberg and Robb N. Russell, Massachusetts Computer Associates, Wakefield, MA
Operating System: Paper Tape
Source Language: Assembly Language
Memory Required: 8K

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

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

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

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

Note: See also 8-527 for PDP-8e compatable version

Media Price Code: A2, B6, F5

Fast Fourier Transform Subroutines **8-143**

Author: James E. Rothman
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: EAE*

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

Versions are included for both real and complex data.

Note: *DECUS 8-446 enables this program to be used on machines without EAE

Media Price Code: A2, B6, F5, H32, K27
Format: OS/8

Reverse Assembler **8-178**

Author: Henry G. duPont, St. George's School, Newport, RI
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: PDP-8 with ASR-33

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

Media Price Code: A2, B4, F5, G20

Disassembler with Symbols, Modifications for use without EAE **8-179**

Author: Alec Smythe
Submitted by: Theodore Green, The Taft School, Waterbury, CT
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Other Software Required: DECUS No. 8-18

8-179 (Cont.)

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

Media Price Code: D1, G5 (Includes F)

ALGOL (4K Version) **8-213**
Author: University of Grenoble, France
Submitted by: Digital Equipment Corp.
Maynard, MA
Operating System: Paper Tape
Source Language: PAL
Memory Required: 4K
Special Hardware Required: Paper tape reader/punch

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

Note: The DECUS Library staff considers this implementation of ALGOL to be too limited to be of value to most users.

Media Price Code: A8, F20, H32
Format: Unknown

QUBIC **8-261**
Author: Tim Yeager,
William Tennent High School, Warminster, PA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: 'QUBIC' plays 3 dimensional Tic-Tac-Toe on an order-4 cube. The program is conversational and uses the Teletype for all I/O. Moves are typed in as 3 coordinates, and outputted using both coordinates and a Teletype printout of the playing board. The strategies employed in playing the game have been found to be extremely good, but the program can be beaten.

Media Price Code: D4, F5, G20

COLPAC **8-335**
Author: Mark Bramhall,
Digital Equipment Corp.
Submitted by: Paul Scriven,
Digital Equipment Corporation, Maynard, MA
Operating System: Paper Tape
Source Language: PAL
Memory Required: 8K minimum

Abstract: COLPAC is an 8K to 12K version of FOCAL with many extended and added instructions and routines. COLPAC is short for Carleton On-line Language for Plotting and Arithmetic Calculations. KV8I/KV8L and BA08 hardware support is optional.

Media Price Code: A5, B26, F10, H32
Format: DECsystem-10

Three Page Floating Point Package **8-375**
Author: Richard Rothman,
Digital Equipment Corp., Maynard, MA
Source Language: PAL-10
Memory Required: 5410-6177, 50-64

Abstract: This package makes available an alternative to the lengthy floating point package distributed by DEC and also utilizes the concept of cutting down exponent size to allow a larger mantissa. It uses 3 word numbers, with 27 bit mantissa and 8 bit exponent.

Note: Source is incomplete.

Media Price Code: A3, F8, G5

Execute Slow **8-400**
Author: Gary G. Barrett,
General Motors Corp., Warren, MI
Revised by: G. A. Moyle,
University of New South Wales, Australia
Operating System: Paper Tape
Source Language: MACRO-8
Memory Required: 4K

Abstract: 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.

Restrictions: User interrupts may not be used.

Media Price Code: D2, G6 (Includes F)

FFTS-R Patch for Use Without EAE **8-446**
Author: Gregory R. Ruth,
Massachusetts Institute of Technology, Cambridge, MA
Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 4K
Other Software Required: FFTS-R (DECUS No. 8-143)

Abstract: 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.

Media Price Code: D2, G5 (Includes F)

RL Monitor System (WCFMPG Version) **8-466**
Author: Richard Lary, Mario DeNobili, et al
Submitted by: Stanley Rabinowitz, Digital Equipment Corp., Maynard, MA
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: TC01 or TC08 DECtape

Abstract: This system is a general purpose operating system including monitor, editor, file handler, etc. It is specifically designed to run on a near minimal configuration (4K and one DECtape drive). It allows the user to save both source and binary files on the DECtape. The line number editor permits resequencing, editing, deleting lines, auto-sequence mode.

Note: This system is not compatible with either OS/8 or 4K Disk Monitor System.

Media Price Code: A6, H32
Format: RL Monitor

8BAL PDP-8 Macro Language, Version 4 **8-497**
Author: David M. Kristol
Wilmington, DE
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K minimum 16K optional

Abstract: 8BAL is intended to be a general macro processor, suitable for use with PAL-8, FORTRAN, or any other language available in PS/8 which uses the system I/O structure. The program acts as a one pass "front end" to the "host" language processor, generating source code for the host language. Because 8BAL uses a special signal character ("@") that is illegal in the host language, 8BAL source code can be mixed with host language statements.

Media Price Code: A6, H32 (Order DECUS 8-530 DECtape)
Format: OS/8

XDDT8E **8-527**
Author: Kincade N. Webb,
Xenex Corporation, Waltham, MA
Operating System: Paper Tape
Source Language: PAL-10
Memory Required: 2K
Special Hardware Required: PDP-8/E, F, or M

Abstract: XDDT8E is an octal symbolic debugging program for the PDP-8E with Extended Memory which preserve the status of the program interrupt system at breakpoints. It is the result of updating XDDT (DECUS NO. 8-127) to make it operate correctly on the PDP-8E. It adds BIN and RIM punching and improves mnemonic typeouts.

Restrictions: Not compatible with PDP-8/I, 8/L, or earlier PDP-8 models.

Media Price Code: A2, B4, F5

8BALIB Macro Library Generator **8-530**
Author: David M. Kristol,
Wilmington, DE
Operating System: OS/8
Source Language: PAL-8

Abstract: 8BALIB processes 8BAL (DECUS NO. 8-497) source files and generates a macro library. The library may later be used by 8BAL to supply otherwise undefined macros to a source program.

Note: DECUS 8-530 DECtape includes files for DECUS 8-497, 8-677, and programs not currently listed in this catalog. Write-ups for 8-497 and 8-677 must be ordered separately.

Media Price Code: A1, H32
Format: OS/8

Integer IOH for FORTRAN Library **8-538**
Author: Ronald C. Barrett,
Northwestern University, Evanston, IL
Operating System: OS/8
Source Language: SABR
Memory Required: 1400_8 words
Other Software Required: OS/8 FORTRAN II

Abstract: INTIOH is for use with FORTRAN programs having only integer arithmetic, and is a substitute for the format interpreting routine of the PS/8 FORTRAN library. Eight pages of core are saved. A new format is defined for input of file names used in device independent input/output and chaining.

Media Price Code: D2, F5, G10

ANOVA and DUNCAN **8-554**
Author: Marjorie H. Kleinman,
Center for Community Research, New York, NY
Operating System: OS/8
Source Language: FORTRAN II

Abstract: ANOVA–Analysis of variance on up to 64 treatment groups. Missing data is permitted. Will compute and print out for each group the number of subjects, mean, standard deviation. T tests are performed between all possible pairs. Also, there is an option for calling DUNCAN multiple range program.

Media Price Code: A1, G14

MULTC Multiple Correlation Program **8-555**
Author: Marjorie H. Kleinman,
Center for Community Research, New York, NY
Operating System: OS/8
Source Language: FORTRAN II

Abstract: Based upon Doolittle's method for solving simultaneous equations for the unknown B's. The maximum number of variables, including the dependent variable, is 8.

Media Price Code: A1, G5

CHISQ Chi Square Program **8-556**
Author: Marjorie H. Kleinman,
Center for Community Research, New York, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K

Abstract: Will compute up to 20 chi squares at a time on tables as large as 8×9. Missing data is permitted. Tables need not all be the same size for the same run. Items may have different ranges. There is an option for computing the contingency coefficient for each table.

Media Price Code: A2, G5

CLUSTR: Cluster Analysis Program **8-557**
Author: Marjorie H. Kleinman,
Center for Community Research, New York, NY
Operating System: OS/8
Source Language: FORTRAN II

Abstract: This program is based on hierarchical grouping, as described in FORTRAN PROGRAMMING FOR THE BEHAVIORAL SCIENCES, by Donald J. Veldman, and is adapted from the program provided in that book.

Media Price Code: A1, G5

CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program **8-558**
Author: Marjorie H. Kleinman,
Center for Community Research, New York, NY
Operating System: OS/8
Source Language: FORTRAN II

Abstract: CORREL will compute Pearson product moment correlations on a matrix of variables as large as 80×80. Missing data is permitted. Before computing correlation coefficients, the appropriate means are substituted for any missing values.

8-558 (Cont.)

PCOMP-VARMX uses the principal components method of extracting roots and vectors, and then performs varimax rotation on the factor loading matrix. Input is in the form of a square correlation matrix, and can be read from any input device. Output from CORREL may be used directly as input.

Media Price Code: A2, G10

A Statistical System in PS/8 **8-564**

Author: Jens G. Rosenkrantz, M.D.,
Childrens Hospital of Los Angeles, Los Angeles, CA
Operating System: OS/8
Source Language: FORTRAN II

Abstract: A system, built upon DEC's PS/8, which runs a number of programs to do statistical analyses of data. The following programs are provided: (1) Mean-Variance; (2) Student's t Test; (3) Rank Analysis; (4) Analysis of Variance; (5) Correlation; and (6) Chi Square. Additional programs can be easily added to the system.

Data may be given from a variety of input devices. Answers may be written, on the teletype, high speed punch or line printer, and are formatted on 11 inch "pages." A large number of data files may be chained together by the user, in order to permit batching of data, each file calling a particular statistical text. Thus the system can function as a desk calculator (with teletype input) or can process large batches of data unattended.

Media Price Code: A6, B5, G64

BIN4SV **8-570**

Author: Roger Kuykendall,
Electro Scientific Industries, Portland, OR
Operating System: OS/8
Source Language: PAL-8

Abstract: This program converts PS/8–OS/8 saved files into binary files which may be stored in PS/8–OS/8 binary format or output as binary on non-file-oriented devices (especially the paper tape punch).

Media Price Code: D2, F5, G7

FP8: Floating Point Arithmetic Software for DEC PDP-8 Series Computers **8-594**

Author: William R. Myers,
Aerojet Nuclear Company, Idaho Falls, ID
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 1249 words

Abstract: FP8 is a floating point arithmetic interpretive program for use in any DEC PDP-8 series computer. It is somewhat smaller and much more versatile than the standard arithmetic package supplied by DEC. The full program requires 1249 locations in one memory field (plus from 5 to 34 locations in remote fields, for linkage) compared to the 1408 locations required by the DEC software. FP8 implements access across memory field boundaries for both instruction sequences and operand reference. A four-bit operation code is used to obtain an expanded set of floating-mode instructions including: add, subtract, multiply, divide, inverse divide, load, store, three-way compare, and jump and jump-to-subroutine. Operate-class instructions include: immediate load, absolute value, clear, change sign, set data field, and set output format. FP8 includes single- and double-precision fix and float operations, and square, square root, exponential, logarithm, sine, cosine, and arctangent functions, and free-format input and variable format output routines. The program size may be reduced to 663 locations by deletion of the function and input/output routines.

Media Price Code: D4, F8, G18

UPDATE: A Program to Make Corrections to a File Containing Records of Variable Length **8-595**

Author: Floor Anthoni and Hans Mees,
Medical Biological Laboratory TNO, Rijswijk,
The Netherlands
Operating System: OS/8
Source Language: PAL-8
Memory Required: 4K + 10 pages in Field 1

Abstract: Designed to facilitate the management of data such as card-indexes on computer mass-storage media. UPDATE provides the user a simple yet powerful means to correct such files by the method of string-replacement. The 4K program, expanded with the capability of doing PS/8 input/output, can easily be adapted to other operating environments.

Restrictions: Maximum record size: 700_{10} characters.

Media Price Code: A2, B5, G38

N.I.H. OS/8 Package **8-597**

Author: Peter Lemkin
National Institute of Health, Bethesda, MD
Operating System: OS/8
Source Language: SABR, FORTRAN II, AND PAL-8
Memory Required: See write-up

Abstract: This package consists of various programs written at N.I.H. for use with the OS/8 Operating System. There are two OS/8 format tapes, one contains source files for each program and includes the necessary documentation, the other tape contains object or .SV files. The write-up which is offered consists of program abstracts and directories for both tapes. The listings have been compiled and are offered as one volume.

Specific components of the N.I.H. package are:

1. LIST–A Batch processing utility for use with the A.B. Dick 960 printer.
2. UTIL2.SB–A Modified UTILITY.SB for OS/8 FORTRAN II supporting the PT08, DC02, and A.B. Dick printer.
3. MAGTAP–A TC58 Magtape Handler for OS/8 FORTRAN II
4. MAGDMP–An OS/8 TC58 Magtape File Storage and Retrieval System.
5. SNDFIL.FT, RECVER.FT–Inter PDP-8 Batch File Transmission Program.
6. FAILSAFE–A Disk/Magtape Utility
7. SENDIT/SENDME–A PDP-10 to PDP-8 File Transmission Utility
8. DELETE–A Program to Delete Illigal OS/8 Files
9. EDIT–Modifications for High Speed PT08 or DC02 Serial Line Interface
10. OS/8 FORTRAN II Logical Arithmetic Subroutines
11. GTCHR–An OS/8 FORTRAN II subroutine to analyze a character input stream from a SYS: Data File
12. Double Precision Arithmetic Package for OS/8 FORTRAN II
13. An OS/8 FORTRAN II Function to do BCD/Decimal number conversion
14. DICOMED 31 Image Display Device Handler
15. A LINC–8 Block 0 Bootstrap for OS/8
16. DATE–FORTRAN II OS/8 Date Subroutine
17. PT08/Datapoint 3300 PS/8 Build Program

Note: Although compatibility with the current OS/8 release is uncertain, this package continues to be one of the most frequently ordered PDP-8 DECUS programs.

Media Price Code: A2, B16, H64, K54
Format: OS/8

CRT: An OS/8 Handler for Tektronix 611 Storage Scope **8-598**

Author: Donald C. Uber,
Bio-Medical Division, Lawrence Livermore Laboratory, Livermore, CA
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: Tektronix 611 Storage Scope with Special interface

Abstract: CRT: is a two-page, write only, non file-structured device handler for the Tektronix 611 storage scope under the OS/8 operating system. The handler is listed in BUILD format for easy addition to an OS/8 system.

Restrictions: Non-standard interface, required, is described in documentation.

Media Price Code: D2, G5

DIBILD: Directory Rebuilder for PS/8 or OS/8 **8-599**

Author: John Alderman,
Digital Communications Associates, Inc., Atlanta, GA
Operating System: OS/8
Source Language: PAL-8

Abstract: DIBILD is a PS/8 or OS/8 utility program to restore directories that have been overwritten. It processes an ASCII file that is produced by PIP in the /E format (or a file that looks like this), and constructs a directory on the specified output device. The user supplies the program with the device code for the directory that is to be constructed, and the input file name (.DI is assumed). The "systems area" of the output specified device is protected since files will start at block 70(8). This feature can be changed by a simple patch to the source and reassembly.

Note: This program is offered with no promise that it is foolproof. Support for this program is not offered, and you use it at your own risk. It is recommended for advanced OS/8 users only.

Media Price Code: A1, F5, G10

EXPIP: Extensions PIP **8-600**

Revised: 8 April 1975
Author: Lars Palmer,
AB Hässle, Fack 40320 MöLNDAL, Sweden
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: EXPIP is a transfer program which was written to perform some of the functions now performed by the FOTP program, now in OS/8. However, EXPIP contains some functions besides those in the FOTP program which makes it worthwhile in some special applications. These functions are:

a) It will do file transfers based on the dates, and it will create a device that contains only the most recent copy of two files.
b) It contains a function for delete after copy which sometimes is very useful.
c) It contains a special function allowing a copy to be made of a DECtape. In a system containing only two DECtapes it will utilize the system DECtape as an intermediate buffer in the copy.
d) As a special option it contains a function to merge a large number of files to one file.
e) It can be used to make a file out of any specified blocks on a device.

Media Price Code: A3, G34, H32
Format: OS/8

OASIS **8-601**

Author: Robert Cronin
Source Language: PAL-III
Memory Required: 8K

Abstract: OASIS is yet another one of the many programs that has PAL III coupled with EDITOR in an 8K machine. It too reads the text image from core, rather than from paper tape. Yet, there are several differences over other versions:
1) Tape punched in XCBL format (See DECUS NO. 8-672) 2) Virtually no operator intervention at the console is required; 3) It contains a built in "operating system" that performs many minor functions that one does not normally want to bother about when testing out sections of a large program; 4) A provision for immediate testing of small sections of a program; 5) A pseudo CONTROL/C feature is now built in that allows the user to terminate virtually all output without intervention at the console; 6) The system is loaded with RIM only.

No source available.

Media Price Code: A2, F5

The PDP-8 Cookbook, Volume 1 **8-602A**

Author: Floor Anthoni,
Medical Biological Laboratory TNO, Rijswijk, The Netherlands
Operating System: Paper Tape
Source Language: PAL-III

Abstract: The PDP-8 cookbook is a collection of subroutines at the assembly level for the purpose of instant use.

Note: Floppy disk includes sources and write-up for 8-602A and 8-602B

Media Price Code: D6, G52, K35
Format: OS/8

PDP-8 Cookbook, Volume 2 **8-602B**

Author: Floor Anthoni,
Medical Biological Laboratory TNO, Rijswijk, The Netherlands
Operating System: OS/8
Source Language: PAL-III, PAL-D, PAL-8

Abstract: This volume adds 44 new subroutines to the gradually increasing PDP-8 subroutine library.

Media Price Code: D8, G64 (See note under 8-602A)

GET Command for the Disk/DECtape Monitor System **8-604**

Author: Craig B. Phyfe,
The Hill School, Pottstown, PA
Operating System: 4K Disk Monitor System
Source Language: PAL-D

Abstract: This is a program developed for use with the Disk Monitor System. It has been used successfully on the 'AF' version of the monitor, but it should run on the '8E' version as well. The program is an extension of the Disk Monitor System, allowing the user to read a specified file from the disk into core without executing it. It is patterned after the OS/8 system 'GET' command, with the restriction that this program will only manipulate programs saved on the system device, whether it be DF/DS-32 disk, RF/RS-08 disk, or DECtape. This program is useful when the user wants to toggle a patch into a system program before executing that program.

Note: Actual system will recognize both Disk and DECtape but GETSYS will only operate on the system device.

Media Price Code: A2, G5 (Includes F)

ADUMP8 8-605
Author: Bruno Nicoletta and G. Franco Reffini,
Digital Electronic Automation, Moncalieri, Italy
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Papertape reader/punch

Abstract: This program provides a means of punching information contained in selected blocks of any core memory field, as binary coded paper tape using the high speed or TTY punch.

Media Price Code: D2, G5 (Includes F)

PIP11 DOS-11 Format DECtape Utility 8-606
Author: Steven Williamson,
Carleton College, Northfield, MI
Submitted by: Bob Ankeney, Steve Paulsen
Oregon Museum of Science and Industry, Portland, OR
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: TC01 or TC08 DECtape

Abstract: PIP11 allows a PS/8 user to read and write on DECtapes formatted and initialized for either DOS or RSTS, the two most commonly used systems on the PDP-11. Additional options allowing the output of data from an 11 DECtape to a DECtape that can be used by TSS/8 basic are also available.

Restrictions: Cannot initialize a DOS or RSTS directory

Media Price Code: A2, G42

CALCU1 8-607
Author: J. V. Hopson
Bureau of Customs, Washington, D.C.
Operating System: OS/8
Source Language: PAL-8
Memory Required: 4K
Other Software Required: DEC Floating Point Package

Abstract: Makes the PDP-8 perform like a printing calculator, with addition, subtraction, multiplication, division, and exponentiation. Prints out subtotals and totals on command. Recognizes control/C for return to monitor. Utilizes one of the DEC floating point packages (EAE—if so equipped, NON-EAE, or 27-BIT). Introductory dialog gives essential operating instructions.

Media Price Code: D2, G5 (Includes F), H32
Format: OS/8

FUTIL: OS/8 File Utility 8-608
Author: Jim Crapuchettes
Frelan Associates, Menlo Park, CA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: This program allows examination and modification of OS/8 (PS/8) mass storage devices from the teletype. A wide variety of commands allows this to occur along with searching, file look-up, and 24-bit integer expression evaluation.

Note: This program is recommended by the DECUS Library for advanced OS/8 users. A similar version of FUTIL was included in the DEC OS/8 V3D Extensions kit.

Note: Write-up on Media.

Media Price Code: A5, H32, K54
Format: OS/8

OCOMP: Octal Compare and Dump 8-609
Author: Dennis McGhie and Jim Crapuchettes,
Frelan Associates, Menlo Park, CA
Operating System: OS/8
Source Language: PAL-8

Abstract: An OS/8 utility program to compare or dump OS/8 files. Masking for compares and searching for dumps are included. The output file contains the contents in octal from the first input file, of all (dump) or part of the words (compare, search) from the file. This program is useful for comparing two versions of a ".SV" file.

Media Price Code: (Order DECUS 8-608)

INVENT-8 8-610
Author: Charles Moeder,
Digital Equipment Corporation, Maynard, MA
Operating System: OS/8
Source Language: SABR
Memory Required: 8K Minimum,
Other Software Required: OS/8 FORTRAN II

Abstract: INVENT-8 is a series of subroutines for manipulating binary unformatted data running under the OS/8 Monitor (OS/8 FORTRAN II). It allows the user to open input and output files as well as read and write binary unformatted, fixed length records of up to 125 12-bit word per record.
Also included is a generalized sort generator for sorting these core image records.

Media Price Code: A3, H32
Format: OS/8

SLED: Source and Listing Editor 8-611
Author: W. D. Gilmour,
Coxbridge House, Coxbridge, Glastonbury, Somerset, England
Operating System: Paper Tape
Source Language: MACRO-8

Abstract: Programs written in condensed format (with lines separated by semicolons and extended as required) do not give neat listings, suitable for publication, when passed through the standard MACRO or PAL III assemblers. SLED secures a neat listing from the raw listing tape produced from the assembler, with one blank line before each label, except labels used to define zero constants, and two blank lines before every break in program counter sequence. Along each line, non-significant spaces are eliminated to give a nicely justified format, and the obtrusive semicolons are removed. The number of lines to a page are controlled and new pages automatically started at suitable points in the listing. Pagination and titling are automatic. The program can be used to lay out source tapes in a similar manner.

Restrictions: Program written for non-standard high speed paper tape reader–use standard DEC reader with caution. One delay-needs adjustment for computer other than 8/S.

Media Price Code: D3, F5, G7

FTMULT: EAE Multiplication for 8K FORTRAN 8-615
Author: Donald C. Parker,
Clarkson College of Technology, Potsdam, NY
Operating System: OS/8
Source Language: SABR
Memory Required: 8K
Special Hardware Required: KE8-I or KE8/E

8-615 (Cont.)

Abstract: This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/I or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.RL. Core space, however, has been sacrificed for this additional speed.

Restrictions: This routine is longer than the LIB8.RL version

Media Price Code: D2, F5, G5

OS/8 Device Handlers for the 57A Magnetic Tape Control 8-618

Author: Donald C. Uber,
Lawrence Livermore Laboratory, University of California, Livermore, CA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: DEC 57A Magtape Control with 1 or 2 tape units OS/8

Abstract: Three programs are included. MTA is a one-page file-structured OS/8 handler using the "simulated DECtape" format of DECUS NO. 8-391. TAP is a two-page non file-structured handler for ASCII files. Both require EAE and run on a 57A magtape controller with two transports. MARK is a stand-alone program for formatting MTA tapes. The write-up includes listings and describes several modifications to the 57A necessary to run the software.

Media Price Code: D3, G5

PHA-8 Data Acquisition System 8-620

Submitted by: R. J. Epler
Digital Equipment Corp., Maynard, MA
Source Language: PAL-10 and PAL-8
Memory Required: 8K
Special Hardware Required: Tektronix 503 Scope, Wilkinson type PHA ADC

Abstract: Five programs (SINGS, SINGDP, PK8L, SING8K, PK8K) are offered which produce a powerful system for the acquisition and analysis of nuclear physics data, made possible by the interfacing of an analog-to-digital converter (ADC) to a DEC PDP-8 family computer.

All programs will run on the PDP-8/L or 8/I. None will run on the PDP-8/S. All programs require the KA8E peripheral. Other necessary peripherals are:

NN01 Nuclear ADC Interface and Scope Control (available from DEC's Computer Special Systems.)

Media Price Code: A3, B5, F12, G46

Gray Code Conversion Package 8-621

Author: Garth Peterson,
Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, Rapid City, SD
Operating System: 4K Disk Monitor System
Source Language: PAL-D

Abstract: Gray Code Conversion Package contains one subroutine for converting from binary to Gray code and three subroutines for converting Gray code to binary. The three Gray-to-binary subroutines provide a trade-off between speed and core usage.

Media Price Code: A1, G8

KV8/I-VT01 Device Handler 8-622

Author: Erik Seliak,
Dept. of Information Science, University of Melbourne, Parkville, Victoria, Australia
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: KV8/I-VT01 or VS8E

Abstract: This is a handler for the VT01 storage display with the KV8/I-VS8E vector generator. It uses the DEC supplied Variable Stroke Character Generator routine and includes character size setting, and clear screen commands which may be entered via the teletype. When the screen is full the handler waits for any character to be typed before clearing the screen and continuing. Because the handler does not fit into two pages part of it is swapped in and out when the handler is called, but the system sees only a two page handler.

Media Price Code: D3, G18

PAGER 8-623

Author: Kevin Willoughby,
Attleboro High School, Attleboro, MA
Operating System: Paper Tape
Source Language: MACRO8 (PAL-D compatible)

Abstract: PAGER reads a symbolic tape and formats it, expanding tabs and paging as necessary. Unlike previous programs of this type (DECUS NO's 184 and 356), PAGER will handle both source and third pass tapes, supply any desired heading to each page, and has no operating restrictions.

Media Price Code: D2, G5 (Includes F)

DUMP and LOAD, TSS/8 8-624

Author: David Wolfe,
Carleton College, Northfield, MI
Operating System: TSS/8
Source Language: PAL-D
Special Hardware Required: TC01/TC08 DECtape

Abstract: This pair of programs provides a backup of TSS/8 (Edusystem 50) disk files on DECtape. Several options allow for flexible dumping and loading. All dumping and loading is done with the timesharing system running.

Media Price Code: A2, F5, G46

Floating Integer Functions for use with 8K FORTRAN 8-625

Author: G. Chase
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: SABR
Memory Required: 1 page
Other Software Required: OS/8 FORTRAN II

Abstract: Supplies the FORTRAN (or SABR) programmer with floating integer functions similar to those available in FOCAL or BASIC. The three functions offered here operate on a floating ("real") argument and return a floating ("real") integer. No change of mode takes place, and the programmer is not limited to arguments less than 2048.0.

Media Price Code: D2, G5

Automated Electrooculography **8-626**
Author: Paul R. Hudak
Submitted by: Dr. John R. Bourne,
Vanderbilt University, Nashville, TN
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: LAB 8/e, A/D Converter, and Schmitt trigger.

Abstract: A real-time program is described which, with the aid of some simple external circuitry, can be used as an automated clinical system for measuring a patient's electrooculogram (EOG) during periods of light and dark adaptation. Such clinical electrooculography is an aid in testing retinal function, but has previously been a time consuming task. A LAB 8/e computer with the standard A/D converter and Schmitt trigger interfaces and a minimum of 4K of memory are all that is necessary for proper operation. Reference should be made to an article, "Computer Automated Electrooculography," which appeared in *Computers and Biomedical Research*, Volume 5, pp. 654-658, 1972.

Media Price Code: D2, F5, G6

TEXPAK: Program to Convert a Line of Text to Packed Octal Format **8-627**
Author: G. Chase,
Portsmouth Abbey School, Portsmouth, RI
Operating System: Paper Tape
Source Language: PAL-III

Abstract: The program accepts a line of typed text and prints out the simple 6-bit stripped octal equivalent that would be generated by the "text" pseudo-op in higher-level assemblers such as MACRO. Simple editing facilities are provided.

Media Price Code: D2, F5

LISP 1.5 Interpreter for PDP-8 with OS/8 **8-628**
Author: Larry Davis,
Washington University and Torbjorn Alm, Autoce AB
Submitted by: Robert Hassinger,
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: Modified version of DECUS NO. 8-102A for use under OS/8 (PS/8). OS/8 file input and output is allowed, which enables the user to prepare LISP programs using OS/8 EDIT. Input and output in ASCII. Facilities for writing own code in assembler to be added to the interpreter for evaluation of special functions are provided for.

Media Price Code: A3, B9, H32, K27
Format: OS/8

Graphing Subroutines for 8K FORTRAN Programs **8-629**
Revised: 19 August 1977
Author: G. Chase,
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: SABR
Memory Required: 1 page
Other Software Required: OS/8 FORTRAN II

Abstract: This program is offered because while graphing is perhaps more naturally done with interpretive languages such as FOCAL or BASIC, there are times when one wishes to do a graph of some sort as part of a FORTRAN program. Unfortunately, the inflexibility of a FORTRAN "Write" statement makes this a tedious bit of programming. Drawing a graph with an x-axis is even harder, if one wishes the points on curve and axis to be in line.

Media Price Code: D2, G5 (Includes F)

Pulmonary Function Laboratory Programs **8-630**
Author: Richard H. Earle, M.D. and Dario B. ndomizi, M.D.,
Biomedical Computer Facilities, The University of Chicago, Chicago, IL
Submitted by: Ronald C. Carter,
Digital Equipment Corporation, Maynard, MA
Operating System: OS/8 (Optional)
Source Language: PAL-8

Abstract: The pulmonary testing software developed at the University of Chicago's Biomedical Computation Facilities is designed to operate on four (4) hardware configurations of the LAB-8/e system.
All tests are adapted for use with a pneumotachograph and the appropriate gas analyzers required for each test. The software is designed to automate the testing procedure and calculations of the following measurements: lung volumes, flow rates, open circuit nitrogen washout and single breath diffusing capacity. The DECtape oriented systems enable the user to store patient data on DECtape for later recall.

Media Price Code: Contact DECUS Library Director.

MINT: Multiple Precision Integer Arithmetic Subroutine **8-631**
Author: Larry Davis,
Washington University, St. Louis, MO
Submitted by: Robert Hassinger,
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: SABR

Abstract: Arithmetic and input-output subroutines are provided for multiple precision integers, for use with OS/8 FORTRAN II.

Note: Tape and write-up include DECUS 8-631 thru 8-635.

Media Price Code: A4, H32
Format: OS/8

RWDF32 **8-632**
Author: Larry Davis,
Washington University, St. Louis, MO
Submitted by: Robert Hassinger,
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: SABR

Abstract: This FORTRAN and SABR callable program allows blocked input and output from DF32 disks where the block size is a parameter.

Media Price Code: (Order DECUS 8-631)

MAC8: 8K MACRO ASSEMBLER **8-633**
Author: Larry Davis,
Washington University, St. Louis, MO
Submitted by: Robert Hassinger,
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: MAC8 is an 8K assembler which runs under PS/8, OS/8 or OS/12. It allows macros to be written along with other assembly language instructions.

Media Price Code: (Order DECUS 8-631)

PAL12D **8-635**
Author: Larry Davis,
Washington University, St. Louis, MO
Submitted by: Robert Hassinger,
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: PAL12D (Davis) is a modification of the PAL8 Assembler to allow either PDP-8 or LINC mnemonics.

Media Price Code: (Order DECUS 8-631)

BEST: Binary to Symbolic Traductor **8-636**
Author: Michel Morel and Francoise Landre,
J. A. Gaudron, E.N.S.E.E.C., Caen, France
Operating System: Paper Tape
Source Language: PAL-III

Abstract: The Binary to Symbolic Traductor accepts a paper tape in a binary format, and produces either a printed listing or a paper tape in ASCII format, acceptable to the PAL III Assembler. It can disassemble 8K programs, with interrupts and FPP instructions. It sorts out instructions from constants, and automatically produces tags at the referenced addresses, which helps the operator to understand quickly any program. The operator can converse with BEST, indicate various starting addresses, and options for outputs (Automatic paging, Pass 3 listing).

Note: No source available.

Media Price Code: A2, F5

GEOMAS **8-638**
Author: Dr. Peter Duncan,
University of Puerto Rico, Mayaguez, P.R.
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 12K

Abstract: The program GEOMAS, developed for the SEAMAP program of the University of Puerto Rico, calculates

(i) Great circle distance between two oceanographic stations
(ii) The mean latitude between the stations
(iii) The coriolis parameter for the mean latitude
(iv) Geostrophic velocities relative to a depth chosen by the operator or to the greatest depth common to both stations
(v) Geostrophic volume transports between given depths (by trapezoidal interpolation) and the total transport between the surface and the reference depth.

A description of the format and manner in which the input depths and dynamic heights are entered, is contained on comment cards in the program.

Media Price Code: D2, G5

OS/8 DISASM **8-639**
Author: John E. Curtis,
Curtis Institute, East Moriches, NY
Source Language: PAL-8
Memory Required: 8K

Abstract: OS/8 DISASM is a disassembler for the conversion of absolute binary files into listings or source files under OS/8. Symbol table definition features permit the reconstruction of literals, direct off-page references, address and data tables, and the insertion of suppressed origins for overlays. DISASM is designed for multi-field programs. Symbols are defined by field and only current field labels are output as labels and direct addresses. Listing organization is designed for ease of interpretation. Source output is designed to imitate programs written by experienced programmers. SPLIT, a program to split large binary files into many small files for easy disassembly, is included.

Media Price Code: A2, B8, F6

OS/8 EDIT PLUS **8-640**
Author: John E. Curtis,
Curtis Institute, East Moriches, NY
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: EDIT PLUS is an editor for OS/8 designed for the full ASCII character set. It will accept and store all codes from 200 to 377 except those used for control characters. It also has two additional search features. Stream searches permit the merging of lines and complete revision of line boundaries. Inter-buffer dump searches permit the extraction of selected entries via searches. EDIT PLUS permits the input and output file lists to be altered during operation. The rubout and line-feed-repeat features of the OS/8 Monitor are used.

Media Price Code: A2, B5, F5

OS/8 FORMAT **8-641**
Author: John E. Curtis,
Curtis Institute, East Moriches, NY
Operating System: OS/8
Source Language: PAL-8

Abstract: FORMAT is supplied as a PAL-8 source tape for easy modification to conform to the user's system. It is written for a system with no line printer and uses the device name LPT and device code 4. Designed for Model 33 and 38 Teletypes with 8 1/2 friction feed options, it can be modified for other terminals. Its tables are set for PAL-8 listings and general PIP dumps of ASCII files.

FORMAT offers the following controls:

1. Individually set tabulation positions.
2. Pagination of output. A switch register option permits inserting a halt between pages for paper changer, etc.
3. Right margin limit to suppress pile-up and Model 38 automatic carriage returns.
4. Left margin control as a switch register option.
5. Vertical tabulation, a set number of lines advance.
6. Model 38 ribbon change commands do not alter tabulation.

Media Price Code: D2, G5

LIFE **8-643**
Author: Philip Corman,
Stewart Radiance Laboratory, Bedford, MA
Operating System: OS/8
Source Language: FORTRAN II

8-643 (Cont.)

Abstract: An OS/8 version of Conway's game "LIFE" as published in several Scientific American articles. The universe consists of a 32 × 32 matrix. Births and deaths are computed according to the number of nearest neighbors.

Media Price Code: D2, G5

MINMON–TD8E DECtape Minimonitor **8-644**
Author: Ian H. Witten,
University of Essex, United Kingdom Department of Electrical Engineering Science,
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: TD8E DECtape

Abstract: The TD8E Minimonitor enables 4K core images to be stored on DECtape and loaded when required. The monitor comprises:

a) A command decoder and DECtape read routine, normally occupying core locations 7600-7777;
b) a modified version of the BIN loader, a 200 word routine capable of being executed in any core page;
c) a DECtape write routine, a 200 word routine capable of being executed in any core page.

Restrictions: This system is not compatible with OS/8.

Media Price Code: D2, F5, G5

DECsystem-8 **8-646**
Revised: August 1974
Author: John R. Covert and Douglas E. Wrege,
The Georgia Institute of Technology, Atlanta, GA
Operating System: DECsystem-8
Source Language: PAL
Memory Required: 8K
Other Software Required: OS/8

Abstract: This package adds many of the PDP-10 operating system features to the PS/8 system, including the capability of further expansion of the monitor command set, the LOGON and KJOB (kill job) commands, and the compile command for shorthand calls to the standard language processors on the system. The philosophy of the additions to the system was to keep as much compatibility between the PDP-10 operating system and the PS/8 system as possible. In some cases, the command syntaxes used are not optimum, but are PDP-10 compatible. Users who use both the PDP-10 and the PS/8 systems on a day-by-day basis will be able to converse with both systems with a minimum of consideration of the differences in command syntaxes.

Media Price Code: A4, H32
Format: OS/8

LOGMIN: Logic Minimization Program **8-648**
Author: David Wu,
Princeton University, Princeton, NJ
Source Language: Unknown
Memory Required: 4K

Abstract: LOGMIN is useful to the logic designer for determining or checking the two-level minimized representation of a logic function, given that function in its sum-of-products or product-of-sums form. The function need not be in its canonical representation.

No source available.

Media Price Code: A2, F5

AMIPED: Automated Medical Interview With Pediatric Data Files **8-650**
Author: David C. Mauger,
University of Auckland, Auckland Hospital, Auckland, New Zealand
Operating System: OS/8
Source Language: BASIC
Memory Required: 8K

Abstract: This program is designed to administer a series of questions in an interactive, branching manner to record and print a summary of the answers, and to generate a file of these for later reference.

The questions supplied are of a pediatric medical nature, and are intended to relieve the doctor of personally eliciting some of the repetitious and standardized parts of the pediatric history, but the programs could administer, without change, any series of questions. Questions need not be medical.

Note: Listings of the data files, which specify questions to be asked during the interviews, are not included with the write-up.

Media Price Code: D2, G30

Regression Analysis Package **8-652**
Revised: February 1976
Author: Theodore E. Bridge,
54 Williamsburg Drive, Springfield, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Other Software Required: DECUS 8-824

Abstract: This package is a group of programs for making a multiple regression with up to 3 independent variables, and up to 28 degrees of freedom. We assume that a dependent variable (W) may be represented by a polynomial function of independent variables (X, Y, Z). We enter data for many points, and ask the computer to find the coefficients for a least squares fit. Provision is made for dumping the coefficients to tape, and reloading in a new location.

Media Price Code: D5, F8

MTAPER: 8K Magtape Monitor (TR05-A Interface) and 8K FORTRAN I/O **8-653**
Author: Robert F. Thomas,
Boston College, Chestnut Hill, MA
Source Language: PAL-III, SABR
Memory Required: 8K
Special Hardware Required: TR05-A 9 track 800 bpi magtape
Other Software Required: 8K FORTRAN

Abstract: The Tape Monitor provides the facility to control an industry compatible 9 track 800 bpi magnetic tape unit interfaced with a TR05-A Interface. The monitor responds to four commands from the keyboard: STORE, EXECUTE, DELETE, and LIST.

A complete set of library programs is also provided to allow I/O through the 8K FORTRAN, SABR and LINKING LOADER system. All usual utilities plus fully formatted I/O can be performed. The magtape drive can be programmed like any other formatted device.

No source available.

Media Price Code: A2, F14

Cabrillo Test Grader 8-654

Author: Don Singer,
Forest Gove Union High School, Forest Grove, OR
Submitted by: Cabrillo Computer Center,
Lompoc, CA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: CM8-E Optical Mark Sense Card Reader

Abstract: This is an assembly language version of DEC's Edutest Test Grading Program. It uses standard Edutest cards and is more efficient and foolproof than Edutest. It produces an optional individual student printout with either right or wrong questions listed, produces a class list showing #of questions each student answered right and his percentage score, and an item analysis showing how many times each question was missed and the correct answer as read from the key card. It handles 999 students and a maximum of 100 questions.

Media Price Code: D3, F7

CINET-BASIC 8-655

Revised: 2 February 1978
Author: Bud Pembroke and David Gillette
Computer Instruction Network
Revised by: G. Chase, OSB
Portsmouth Abbey School, RI
Operating System: Paper Tape
Source Language: PAL-III, ODT
Memory Required: 4K
Special Hardware Required: Teletype with reader/punch recommended

Abstract: CINET-BASIC is an interpretive compiler patterned after the original Dartmouth BASIC. It was built by modifying FOCAL-69, and uses many of the same subroutines and/or methods. Included are statements such as Let, Print, GO TO, IF—then, For and Next, GOSUB and Return, Input; and commands such as RUN, Edit, ERASE, LIST and Interrupt. Error messages are given in terms of an error number and line number.

The program occupies locations 0000-3252 and 4600-7600. The user's written BASIC code is stored from 3252 on. This working storage can be expanded by deleting the trigonometric and exponential functions.

Revisions included with this tape include new versions of the internal 'ALIGN' and 'FIX' routines. The "INT (X)" function now yields the correct result regardless of the value of the argument. A second patch implements the "SGN (X)" function with the restriction that it yields a +1 result if X = 0, and it requires the use of core locations 7600-7610.

DECUS 8-655 includes a revised binary tape of CINET-BASIC, and can be loaded without a checksum error.

Note: Sources and listings of CINET-BASIC are not available.

Media Price Code: A2, F6

SELFDRILL: The Sloan Selfdrill Program 8-656

Author: Francis M. Wheeler,
Beloit College, Beloit, WI
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: ASR33 Teletype recommended

Abstract: This program converts a PDP-8 with teletype into a *general* learning school, i.e., the program is *totally independent of subject matter.* User types a set of cue/response items into core file. Program presents each cue repetitively, at intervals determined by user's response to the particular item, until he is able to type the specified response quickly, accurately and consistently. Includes file edit features, tape read and punchout of drill items, the capability of systematic review, randomized comments, randomized use of learner's name, program-assisted typing with instant feedback and mitigation of non-significant errors during response.

Restrictions: Requires modification for use on parity terminals such as most DECwriters and DECscopes.

Note: See also DECUS No. 8-769.

Media Price Code: A2, B10, F6, G110

Neurophysiological Data Collecting Program 8-657

Author: Fred Delcomyn,
Singer, Forest Gove Union High School
Operating System: 4K Disk Monitor System
Source Language: PAL-D
Memory Required: 8K
Special Hardware Required: LAB-8 system with AX08 Laboratory Peripheral.

Abstract: This program consists of three sets of interrelated routines, (INPUT, DSKFIL, TR) which will accept up to three channels of pulse input and four channels of analog input via the AX08 Laboratory Peripheral. Data consisting of the time interval between the pulse inputs, and the amplitude of the analog inputs (measured at user-specified intervals) are stored in data buffers from which they are written onto a disk via another routine (from the second of the three sets). The data stored on disk may be "translated" by routines contained in the third set into ASCII coded decimal digits for subsequent analysis.

Note: Ordering Information

INPUT: A Neurophysiological Data Collecting Program 8-657A
Media Price Code: A3, B5, F5, G40

DSKFIL: A File Structured Disk Writing Routine and Helpers 8-657B
Media Price Code: A2, B2, F5, G10

TR: A Binary to ASCII Translator 8-657C
Media Price Code: A2, B2, F5, G10

Extended Double Precision Interpretive Package 8-658

Author: Bruce D. Geelhood,
University of Washington, Seattle, WA
Operating System: Paper Tape
Source Language: PAL-III

Abstract: This is a revised and extended version of the double precision interpretive package submitted by Roger Anderson in 1968 (DECUS 8-115a). This package performs double precision signed integer arithmetic operations using specially defined single word memory reference instructions. The package is similar to the Floating Point Package (DIG-8-5-S) but occupies much less core. Only two pages of memory and 15 words on page zero are required. This package performs the arithmetic operations of addition, subtraction, multiplication, and division. It can also jump in the interpretive mode, execute external subroutines, store into core double precision, and perform several non-MRI operate commands. The operate commands enable clearing, branching, negating, and exiting. This extended version is superior to its predecessor in that it has complete overflow protection, several operate instructions, and an easy method of adding additional functions. In spite of these extensions the new package occupies the same amount of memory.

Media Price Code: D2, F5, G12

8-643 (Cont.)

Abstract: An OS/8 version of Conway's game "LIFE" as published in several Scientific American articles. The universe consists of a 32 × 32 matrix. Births and deaths are computed according to the number of nearest neighbors.

Media Price Code: D2, G5

MINMON–TD8E DECtape Minimonitor 8-644

Author: Ian H. Witten,
University of Essex, United Kingdom Department of Electrical Engineering Science,
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: TD8E DECtape

Abstract: The TD8E Minimonitor enables 4K core images to be stored on DECtape and loaded when required. The monitor comprises:

a) A command decoder and DECtape read routine, normally occupying core locations 7600-7777;
b) a modified version of the BIN loader, a 200 word routine capable of being executed in any core page;
c) a DECtape write routine, a 200 word routine capable of being executed in any core page.

Restrictions: This system is not compatible with OS/8.

Media Price Code: D2, F5, G5

DECsystem-8 8-646

Revised: August 1974
Author: John R. Covert and Douglas E. Wrege,
The Georgia Institute of Technology, Atlanta, GA
Operating System: DECsystem-8
Source Language: PAL
Memory Required: 8K
Other Software Required: OS/8

Abstract: This package adds many of the PDP-10 operating system features to the PS/8 system, including the capability of further expansion of the monitor command set, the LOGON and KJOB (kill job) commands, and the compile command for shorthand calls to the standard language processors on the system. The philosophy of the additions to the system was to keep as much compatibility between the PDP-10 operating system and the PS/8 system as possible. In some cases, the command syntaxes used are not optimum, but are PDP-10 compatible. Users who use both the PDP-10 and the PS/8 systems on a day-by-day basis will be able to converse with both systems with a minimum of consideration of the differences in command syntaxes.

Media Price Code: A4, H32
Format: OS/8

LOGMIN: Logic Minimization Program 8-648

Author: David Wu,
Princeton University, Princeton, NJ
Source Language: Unknown
Memory Required: 4K

Abstract: LOGMIN is useful to the logic designer for determining or checking the two-level minimized representation of a logic function, given that function in its sum-of-products or product-of-sums form. The function need not be in its canonical representation.

No source available.

Media Price Code: A2, F5

AMIPED: Automated Medical Interview With Pediatric Data Files 8-650

Author: David C. Mauger,
University of Auckland, Auckland Hospital, Auckland, New Zealand
Operating System: OS/8
Source Language: BASIC
Memory Required: 8K

Abstract: This program is designed to administer a series of questions in an interactive, branching manner to record and print a summary of the answers, and to generate a file of these for later reference.

The questions supplied are of a pediatric medical nature, and are intended to relieve the doctor of personally eliciting some of the repetitious and standardized parts of the pediatric history, but the programs could administer, without change, any series of questions. Questions need not be medical.

Note: Listings of the data files, which specify questions to be asked during the interviews, are not included with the write-up.

Media Price Code: D2, G30

Regression Analysis Package 8-652

Revised: February 1976
Author: Theodore E. Bridge,
54 Williamsburg Drive, Springfield, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Other Software Required: DECUS 8-824

Abstract: This package is a group of programs for making a multiple regression with up to 3 independent variables, and up to 28 degrees of freedom. We assume that a dependent variable (W) may be represented by a polynomial function of independent variables (X, Y, Z). We enter data for many points, and ask the computer to find the coefficients for a least squares fit. Provision is made for dumping the coefficients to tape, and reloading in a new location.

Media Price Code: D5, F8

MTAPER: 8K Magtape Monitor (TR05-A Interface) and 8K FORTRAN I/O 8-653

Author: Robert F. Thomas,
Boston College, Chestnut Hill, MA
Source Language: PAL-III, SABR
Memory Required: 8K
Special Hardware Required: TR05-A 9 track 800 bpi magtape
Other Software Required: 8K FORTRAN

Abstract: The Tape Monitor provides the facility to control an industry compatible 9 track 800 bpi magnetic tape unit interfaced with a TR05-A Interface. The monitor responds to four commands from the keyboard: STORE, EXECUTE, DELETE, and LIST.

A complete set of library programs is also provided to allow I/O through the 8K FORTRAN, SABR and LINKING LOADER system. All usual utilities plus fully formatted I/O can be performed. The magtape drive can be programmed like any other formatted device.

No source available.

Media Price Code: A2, F14

points.

d) The program calculates the error matrix for all the constants and outputs a table of calculated y values versus experimental.
e) In an FPP-12 configuration the program iterates most functions in under 10 seconds.

Note: See also FOCAL8-72 write-up.

Media Price Code: A2, H32, K27
Format: OS/8

Source Language: PAL-III
Memory Required: 107_8 locations
Special Hardware Required: LAB-8 configuration

Abstract: This subroutine may be called to measure the time interval between events with a specified degree of accuracy. Intervals are stored as non-zero, single precision, unsigned integers. This is an efficient way to code activity information since histograms can easily be generated to allow examination of the activity later.

Media Price Code: D2, G5

NORDER: A Subroutine to Generate nth Order Histograms from Inter-Event Intervals **8-666**

Author: A. J. Swan,
Agricultural Research Council's Poultry Research Centre, Edinburgh, Scotland
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 120_8 locations

Abstract: This subroutine may be called to generate nth order histograms from stored inter-event intervals. The main advantages are that only interval measurements need be stored permanently and the order n can be varied to suit the prevailing situation at histogram generation. The main use has been to generate histograms to estimate the nth order probability density functions of the inter-event interval distributions encountered in unit neuronal activity studies.

Media Price Code: D2, G6

LABLDP: A TSS/8 Tape Labeling Program **8-667**

Author: Leonard P. Levine,
University of Wisconsin-Milwaukee, Milwaukee, WI
Operating System: TSS/8
Source Language: PAL-D
Special Hardware Required: Paper tape punch

Abstract: LABLDP is a TSS/8 program to punch a user inputted buffer of characters in block form into the high speed papertape output. Automatic assignment of the high speed punch is done as LABLDP starts. Editing of the user input via rubout commands may be done before the output is punched. The user's account number and the correct date are the first characters punched into the output buffer. This information may be deleted if desired by the user.

Media Price Code: D2, F5, G6

RAW: A Reverse Assembler of Windsor **8-668**

Author: P. A. V. Thomas,
University of Windsor, Windsor, Ontario, Canada
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: This program was written for a 4K PDP-8 computer to obtain a symbolic program from a binary program produced by the PAL III assembler. The output obtained may be in the standard assembler output format or in a format suitable as input to the assembler for reassembling after modification. The program will handle most of the standard mnemonics including EAE and floating point operations. The only known limitations are (i) a FIELD statement is not acceptable and (ii) subroutines with multiple arguments and/or returns will not give a properly formatted output but will have to be interpretted by the user.

Media Price Code: A2, B4, F5, G22

BIOLSD: Antibiotic Assay Using Latin Square Design **8-669**

Author: J. D. Piguet,
Institute of Hygiene, Department of Bacteriology, Geneva, Switzerland
Operating System: Paper Tape
Source Language: MACRO-8
Memory Required: 4K
Special Hardware Required: PDP-8/E required
Other Software Required: 27-bit Floating Point Pkg (DEC-08-NFPEA-A-PB)

Abstract: This program computes the potency of an unknown preparation of an antibiotic from the diameters of inhibition given by three dilutions of this preparation and three dilutions of a standard preparation, when the doses are applied in a 6×6 Latin square with each dose occurring once in each row and column. When all 36 diameters have been entered through the keyboard or one of the readers, the teletype prints the complete analysis of variance, the potency of the test preparation, expressed as a percentage of the standard preparation, the fiducial limits for $P = 0.95$, and the fiducial interval, expressed as a percentage of the potency.
BIOLSD is available in French or in English.

Media Price Code: A2, B3, F6, G26

Plotting Package for OS/8 FORTRAN IV **8-670**

Author: Jonathan R. Gross,
University of Minnesota West Bank, Minneapolis, MN
Operating System: OS/8
Source Language: RALF, FORTRAN IV
Memory Required: 5 pages
Special Hardware Required: EAE and XY8E Plotter

Abstract: Basic plotting package including: PLOT (X, Y, IPEN), SYMBOL (X, Y, HGT, BCD, ANGD, N), ASSIGN (X, Y), WHERE (X, Y), FACTOR (FACT), NUMBER (X, Y, HGT,–VAL, ANGD, ND), and program TAB to generate a table of symbols and their values.

Media Price Code: D3, F10, G22, H32
Format: OS/8

XCBL and XBIN Loader **8-672**

Author: L. Paul Geffen and Roger Geffen,
Data Research Associates, Wayland, MA
Operating System: Paper Tape
Source Language: PAL (Will tab only with MACRO)

Abstract: This combination XCBL and XBIN loader selects correct loader automatically. High speed version is offered but instructions are given for use with low-speed reader also.

Media Price Code: D2, G6 (Includes F)

Random Number Generators for Use With FORTRAN or SABR Programs **8-673**

Author: Geoffrey Chase,
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: SABR
Memory Required: 2 pages

Abstract: Two 35-bit random generators taken from Knuth's "Seminumerical Algorithms," adapted to the 27-bit format of the PDP-8 FORTRAN/SABR library. The user can preset the starting point of either sequence by his choice of argument in the calls Y = RAND(X) or Y = RND(X).

Media Price Code: D2, F5

INDUMP: Input Dump **8-675**

Author: Donna Stevens,
New Mexico State University, Las Cruces, NM
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Some external device

8-675 (Cont.)

Abstract: This program prints out the content of the input buffer each time external print is received. Bit 11 on the switch register allows the option of printout in binary or octal. It was developed as a programming aid, but is used extensively for design, diagnosis of problems, and repair of research apparatus.

Media Price Code: D2, G5 (Includes F)

MACRO-8 Patch to Move DELETE Routine **8-676**
Author: Roger Geffen,
Data Research Associates, Wayland, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Other Software Required: MACRO-8 (DEC-08-CMAB-PB)

Abstract: This patch moves the 'DELETE' routine to the space reserved for the base page literal buffer to make room for other patches in MACRO-8.

Media Price Code: D1, G5 (Includes F)

STAR PIP **8-677**
Author: David M. Kristol,
Arlington, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: "STAR PIP" is an extremely useful file utility program for OS/8 that incorporates some of the features of PDP-10 PIP. Foremost of these is the ability to move and delete files with common extensions or names. (STAR PIP is not a modified PIP, but a separate program. PIP functions are NOT duplicated in STAR PIP).

Media Price Code: A2, H32 (Order DECUS 8-530 DECtape)
Format: OS/8

Routine to Expand and Modify the DEC Floating Point Package **8-678**
Author: Klaus Lickteig,
Institut fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany
Source Language: PAL-III
Other Software Required: Floating Point Pkg Version B (DEC-08-YQYB-PB)

Abstract: This package includes:
1. Routines to control the input and output device. 2. Routines to convert numbers of 12 bits and 24 bit length or of Floating-Point format. 3. Routine to determine the octal form of a decimal Floating-Point number.

Media Price Code: D2, G8

MAPPER **8-679**
Author: James Puccio,
Canton High School, Canton, MA
Operating System: TSS/8
Source Language: PAL-D

Abstract: This program provides the TSS/8 PAL programmer with a method of mapping out precisely where in core his object program shall lie. The report is printed out on $8\frac{1}{2} \times 11''$ pages, and a report of the total amount of core used is also provided.

Media Price Code: D2, G8

WLSHTR: A Fast Walsh Transform Subroutine for Real Valued Functions **8-680**
Author: Nezih Geckinli,
Middle East Technical University, Ankara, Turkey
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: The FWT subroutine enables the user to take either the Fast Walsh Transform (FWT) or its inverse (IFWT) of a real valued series. The subroutine FWT, which begins at 0200, calculates both the FWT and IFWT.

Media Price Code: A2, G5

CASE: Carleton Symbolic Editor **8-681**
Author: Bruce Christopher,
Carleton College, Northfield, MN
Operating System: TSS/8
Source Language: PAL-8
Memory Required: 4K

Abstract: This symbolic editor adds new commands to the original EDIT-8 program copyright by DEC in 1970 and revised for TSS/8 by Rick Merrill (4/17/70). Among the new features are a new command H, to append from the high-speed reader; line numbers printed on the line-printer or teletype but not on the high speed punch; a command U, to release the high-speed reader, line printer and high-speed punch; tabs not followed by rubout in the ASCII disk file intra-buffer string searching and many others.

Note: Requires OS/8 for assembly.

Media Price Code: A1, B7, F5, G54

BNLOAD, TSS/8 Binary Loader **8-683**
Author: Bret Saxe
Albany, NY
Operating System: TSS/8
Source Language: PAL-D
Memory Required: 1 page
Special Hardware Required: Paper tape reader

Abstract: BNLOAD is a TSS/8 user program to load binary format tapes directly into core. It is an alternative to the lengthy binary tape loading procedure (requiring PIP and LOADER) presently in effect on most TSS/8 installations.

Restrictions: Works only on TSS/8

Media Price Code: D2, G5 (Includes F)

IJPA: Injection Patcher **8-684**
Author: Garth Peterson,
South Dakota School of Mines and Technology, Rapid City, SD
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 8K

Abstract: Injection Patcher accepts and stores program patches in field 1. Patches may be read in as binary tapes or may be entered in octal on the teletype keyboard. After the patches have been stored, a main binary input tape is read and a new main binary tape is punched out with patches inserted at the appropriate locations rather than being appended at the end. The stored patches may also be dumped as a binary tape.

Media Price Code: A2, F5, G30

DPSQRT: Double Precision Square Root for PDP-8 8-685

Author: Jay Mickevicius,
University of Illinois, Chicago, IL
Source Language: PAL-III

Abstract: DPSQRT is a subroutine to compute a single precision square root from a double precision argument. The argument is assumed positive and can be up to 24 bits in length. This program is a modification of DECUS 8-61.

Media Price Code: D1, G5

Bowling League Results, Standings and Averages 8-686

Author: Robert H. Tedford,
Digital Equipment Corporation, Maynard, MA
Operating System: COS-300
Source Language: DIBOL
Memory Required: 12K

Abstract: The purpose of this program is to automate the task of preparing weekly bowling results. These programs were written for a 16-team league and 128 bowlers, including substitutes. There is room for expansion if your league requires more teams and/or bowlers.

Note: Written for COS Monitor Version 3.07. Compatibility with COS-310 is unknown.

Media Price Code: A2, G14, K27
Format: COS-310

GOLF 8-687

Author: Robert H. Tedford
Digital Equipment Corporation, Maynard, MA
Operating System: COS-300
Source Language: DIBOL
Memory Required: 8K

Abstract: This program, written in DIBOL for the COS 300 operating system, invites the user to play golf at the championship course just minutes from the heart of downtown Maynard. The game is explained as you proceed to the first tee.

Note: Compatibility with COS-310 is unknown.

Media Price Code: A1, G14

FOOTBALL 8-688

Author: Robert H. Tedford,
Digital Equipment Corporation, Maynard, MA
Operating System: COS-300
Source Language: DIBOL
Memory Required: 8K

Abstract: This program is written in DIBOL and requires the COS 300 operating system. With an LA30 as the console, it takes approximately 12 minutes to play a complete game. In the event of a tie at the end of regulation time, a sudden death overtime period may be initiated with the team that kicked-off to start the first half kicking again.

At the conclusion of the game, statistics on first downs, yards gained, passing, etc., will be displayed on the terminal and cumulative data will be updated on logical unit 5.

Note: Compatibility with COS-310 is unknown.

Media Price Code: A2, G10

UFDSPY: A TSS/8 Line-Printer UFD Dump Program 8-689

Author: James Ward
Natick High School, Natick, MA
Operating System: TSS/8
Source Language: PAL-D
Memory Required: 1K
Special Hardware Required: TSS/8 Configuration and Line-Printer

Abstract: UFDSPY is a program designed to dump the user's file directory (UFD) in readable form onto the line-printer. A header is printed consisting of the user's account number, the system date, and column headings. Information printed for each file includes the file name, extension, protection code, number of segments occupied by the file, date of creation, pointer to retrieval, and the link to the next UFD entry. At the end of the listing the total number of blocks in use by the files on this account is printed.

Media Price Code: D2, G8

RANDU 8-690

Author: Lars Palmer
A B Hassle, Fack, Molndal, Sweden
Operating System: OS/8
Source Language: RALF
Other Software Required: OS/8 FORTRAN IV

Abstract: This is the random number generator from DECUS 5-25 interfaced to the FORTRAN IV system. The routine also contains a possibility to generate a truly random starting point for the pseudo random sequence.

Media Price Code: D2, G5 (includes F)

OLEVX AND OLEVAX: 4-Channel Averager and Analysis System 8-692

Author: Gary D. Paige,
University of California, Irvine; Irvine, CA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: LAB-8 System with AX08, and 2 TC08/TC01 DECtapes.

Abstract: The OLEV software system is a signal averager and analyzer designed for on-line neurophysiological experimentation (stimulus-evoked potential data, etc.). Up to 4 analog channels can be processed simultaneously. Sweep rate and sweep time are selectable to speeds as fast as 18/sec. and 25.6 ms./swp., respectively; up to 128 sweeps averaged in a given trial. Averages are formed by initially averaging sweeps to form consecutive component averages, which are then averaged to form the end result (a 32-sweep average will be formed from 4 component 8-sweep averages initially formed by the 32 sweeps, for example). All data can be stored on DECtape for future automatic analysis, including peak-to-peak amplitude and peak-latency data within any designated time window. Graphs of such data can be formed and stored automatically as well.

Media Price Code: A2, H32
Format: OS/8

A Programmed Learning Course in Boolean Algebra 8-693

Author: William Swan,
University of Calgary, Alberta, Canada
Operating System: TSS/8
Source Language: PAL-D
Memory Required: 4K

Abstract: This program is intended to help students to learn the fundamentals of Boolean algebra, using the TSS/8 facilities.

Media Price Code: A2, G12

Teletype Line Printer Emulator Handler for OS/8 8-694

Author: Stanley R. Vivian,
University of Manitoba, Winnipeg, Canada
Operating System: OS/8
Source Language: PAL-8

Abstract: This OS/8 handler emulates the LP08 line printer on the ASR33 teletype. It handles form-feeds, tabs, line overrun and paging. A character count automatically generates a carriage return-line feed whenever the count exceeds 72. A line count automatically pages at 62 lines by introducing 4 additional CR/LF's to produce 11-inch pages. Due to space limitations in the handler, vertical tab results in a single additional CR/LF. An attempt to read from the handler results in an immediate normal exit. First entry to the handler generates 4 CR/LF's. There is no closing form-feed.

Media Price Code: D2, G5

DECTYP: One-Word Signed Decimal Print 8-696

Author: John Briggs,
Davenport, IA
Source Language: PAL-D, PAL-III
Memory Required: 102_8 words

Abstract: This subroutine will type out the signed decimal integer corresponding to the two's complement number contained in the accumulator. Spaces are inserted in the output to place the right-hand digit in a predictable position.

Media Price Code: D1, G5

DDTSS8: DECtape Dump for Time Shared System-8 8-697

Author: David Dodell,
Dix Hills, NY
Operating System: TSS/8
Source Language: PAL-D

Abstract: This program will take the contents of a DECtape block and print it out on your teletype. Some features of the program are:
(a) input is by octal numbers, (b) restarting by ↑C, (c) error message, (d) will print out job number if the DECtape is assigned to another job, (e) size-location 0-577 in core, 2 TSS/8 Disk Segments, (f) extra line feeds possible between lines of dump.

Media Price Code: D2, F5, G8

TEKLIB: A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010 8-698

Author: P. C. Diegenbach,
Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands
Operating System: OS/8
Source Language: SABR and FORTRAN II
Memory Required: 2K
Special Hardware Required: Tektronix 4010 terminal

Abstract: A library of OS/8 FORTRAN callable subroutines to use the Tektronix 4010 (or 4002) terminal with storage scope (and a 4610 hardcopy device if available). The subroutines serve graphic and alphanumeric in and output.

Media Price Code: D2, F5, G16
Format: OS/8

COGO-8 8-702

Author: Digital Equipment Corporation,
Maynard, MA
Operating System: OS/8
Source Language: FORTRAN IV
Memory Required: 16K
Special Hardware Required: Extended precision (72-bit) floating point hardware may be required in order to obtain sufficient accuracy for general use of this package on the PDP-8.

Abstract: COGO is a problem-oriented computer language and programming system for solving geometric problems. Typical problems suitable for COGO include: control and land surveys, right-of-way surveys, subdivision planning, construction layout, highway and interchange design, bridge geometry.
A knowledge of programming is not required to successfully use COGO.
COGO-90, originally developed by Professor C. L. Miller and his staff at the Massachusetts Institute of Technology, has been extended and implemented by Computer Dynamics Incorporated to run on a PDP-10 computer. COGO-8 is the PDP-10 version which also has been extended and implemented to run on any (PDP-8, PDP-12) OS/8 FORTRAN IV system which includes a minimum hardware configuration of 16K of memory and two DECtapes. The speed and operation of COGO-8 is greatly enhanced by the use of a disk and Floating Point Processor.
The OS/8 Reference Manual and OS/8 FORTRAN User's Manual (DEC-S8-CFTNA-A-D) are helpful reference quides to the COGO operation.

Media Price Code: B12, E9, H64
Format: OS/8

AMORT: Incremental Amortization Schedule 8-703

Author: Susan Conrad,
Emory University, Atlanta, GA
Revised by: R. L. Jenson, School of Business,
Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K

Abstract: The program computes an amortization schedule given the interest rate, amount of the loan, number of years over which the loan is to be repaid, and conversion periods per year.
From this information, the program computes the periodic payment and the portion of the periodic payment applied to the principal, the portion of the periodic payment applied to interest, and the balance at the time of each payment. All numbers are rounded to the nearest cent.

Note: The DECtape for DECUS 8-703 contains sources for eight programs DECUS 8-703 through 8-710. Documentation must be ordered separately.

Media Price Code: D2, H32
Format: OS/8

ANOV1: Analysis of Variance, Unequal N **8-704**
Author: S. Tobias, R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K

Abstract: This program computes a one way analysis of variance, means, variances and standard deviations even though each of the subgroups has a different number of subjects.

Media Price Code: D2, H32 (Order DECUS 8-703 DECtape)

ARNORM: Area Under Normal Curve **8-705**
Author: R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II

Abstract: ARNORM is a function subroutine designed to compute the area under a normal curve in terms of Z standard deviations.

Media Price Code: D2, H32 (Order DECUS 8-703 DECtape)

BITSET **8-706**
Author: R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Source Language: SABR and FORTRAN II
Memory Required: 1 page
Special Hardware Required: EAE

Abstract: A set of three 8K FORTRAN function subprograms to permit the user to examine and/or set individual bits in a specified integer data word.

Media Price Code: D2, H32 (Order DECUS 8-703 DECtape)

CRSTAB: Cross Tabulation Program **8-707**
Author: L. G. Carter, R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K
Special Hardware Required: Card Reader and Printer

Abstract: CRSTAB is a cross-tabulation program for the analysis of survey type data. It permits the user to enter up to 9 responses to each of up to 60 questions. In conversational mode the user may indicate various tree-structure type combinations which are to be cross-tabulated. The maximum number of possible combinations is 2000 and the maximum number of responses on any combination is 2047. The tree structure may have up to 6 levels (from 2 to 6 questions may be cross tabulated at one pass).

Media Price Code: D2, H32 (Order DECUS 8-703 DECtape)

EMLP: Emory Linear Programming Package **8-708**
Author: F. W. Wood, R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN IV and RALF
Memory Required: 8K minimum

Abstract: This is a small linear programming package intended for class demonstration use and/or linear programming problems of limited size. It has been adapted for the PDP-8, running under the OS/8 (or PS/8 or DECsystem-8) operating system, from a program originally written for the IBM 1620 by F. W. Wood of National Steel Corporation. This version includes some minor corrections and changes. Much of the description is taken directly from his original documentation. Additions, changes, etc. are by R. L. Jensen. The programming language used for this version is 8K FORTRAN for OS/8. Input/output options may have to be modified for a particular configuration.

Media Price Code: D2, H32 (Order DECUS 8-703 DECTAPE.)

FINCA: A Computer Program for Financial Statement Analysis **8-709**
Author: D. Eiteman, R. L. Jensen, G. Chalmers, M. Gordon & others
Submitted by: R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K minimum
Special Hardware Required: Card Reader and Printer (132 col.)

Abstract: This program analyzes commonly published financial data, giving three pages of commonly used ratios and gives plots of earnings per share, sales and dividends. Up to ten years of data may be handled in 8K of core, and the program may easily be expanded if more core is available.

Media Price Code: D3, H32 (Order DECUS 8-703 DECtape)

MULTS: Multiple Regression Program **8-710**
Author: J. Capato, R. L. Jensen, B. Watzman, C. Curran, G. Michel
Submitted by: R. L. Jensen,
School of Business, Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 12K*
Special Hardware Required: Line printer used for plots

Abstract: This program uses a least squares procedure to calculate the estimates of the partial regression coefficients in a multiple linear model. It provides several other statistics, permits extensive automatic transformation of data, and provides plots of user selected data.

Note: *Submitted for 12K, but may be segmented for 8K systems

Media Price Code: D2, H32 (Order DECUS 8-703 DECtape)

Plotting Subroutines for OS/8 FORTRAN II **8-713**
Revised: May 1975
Author: Gregory R. Ruth,
Charles Stark Draper Laboratory, Cambridge, MA
Operating System: OS/8
Source Language: SABR
Memory Required: 2 to 13 pages
Special Hardware Required: Calcomp 565 plotter

Abstract: A collection of SABR coded routines (callable from 8K FORTRAN) that provide a comprehensive plotting capability for PDP-8's equipped with a Calcomp 565 plotter (either "encoded" or "unencoded") or equivalent. The functions provided cover pen movement, plotting character strings, plotting floating point numbers (with rounding), setting up a coordinate grid in an $8\frac{1}{2}'' \times 11''$ space, and plotting points in that coordinate space.

Media Price Code: A2, H32
Format: OS/8

FORTRAN IV Graphics Subroutines **8-715**
Author: Dennis McGhie,
Stanford Medical Center, Stanford, CA
Operating System: OS/8
Source Language: FORTRAN IV and RALF
Memory Required: 8K
Special Hardware Required: Plotter

Abstract: This is a set of four subroutines which allow plotting under OS/8 FORTRAN IV. Included are subroutines for driving a plotter (XY12 or VP8/I) or buffering plotter commands to a file in a format compatible with PLOTVS (DECUS NO. 12–157). Entries are also provided for automatic scale setting, character plotting, and string plotting. The character and string routines are written in FORTRAN. The pen move routines are written in RALF.

Media Price Code: D3, H32
Format: OS/8

F4EAE: EAE OVERLAY FOR FRTS **8-717**
Revised: April 1975
Author: Phillip D. Siemens
Lawrence Livermore Laboratory, Livermore, CA
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: PDP 8/I or PDP 8 EAE (i.e. mode A EAE)
Other Software Required: OS/8 FORTRAN IV

Abstract: This collection of arithmetic routines overlays FRTS (DEC-S8-LRTSA-A-PS 5/73) in the OS/8 FORTRAN IV system. It enables a PDP-8/I (or classic PDP-8 with conditional assembly) to utilize its EAE option. Approximately a 20% increase in overall execution speed can be obtained with this overlay.
Version 2 corrects errors in the multiply and alignment routines.

Media Price Code: D2, F5, G8

NSD: Nominal Standard Dose **8-718**
Author: Pei-nan Tsung, Ph.D.,
The Buffalo General Hospital, Buffalo, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K

Abstract: This program furnishes the result of calculating nominal standard dose values for complex treatment schedules which allow changing in fractionation pattern per week and up to two consecutive split course radiotherapy.

Media Price Code: D2, H32
Format: OS/8

OS/8 Software for a TC58 Magtape Control **8-719**
Author: W. Kenneth Patton and Terrence D. Lagerlund,
Polytechnic Institute and State University, Blacksburg, VA
Operating System: OS/8
Source Language: PAL-8, SABR, FORTRAN II
Memory Required: 8K
Special Hardware Required: TC58 Magtape Control with TU20 or equivalent tape drives (7 or 9 track)

Abstract: This is a package of three programs which extend the input/output capabilities of system, user, and 8K FORTRAN programs in OS/8 to include the TC58 magnetic tape. The first is a TC58 device handler (2 page, non file-structured) that includes six special function calls and can use any desired tape recording format. The second is a set of nine SABR subroutines (FORTRAN-callable) that provide formatted and unformatted tape input/output and special functions (endfile, spacing forward and reverse, rewind). The third is a SABR main program which allows the operator to position and write EOF marks on a tape, dump records in octal, and write test data.

Restrictions: No EOF written to close tape files. Does not use TC58 continuous mode.

Media Price Code: A3, B4, F5, G30, H32
Format: OS/8

LSTDMP: Binary Tape Dump/Lister **8-720**
Author: Mark Jaffe,
General Electric Company, Ocean Sciences Lab., Philadelphia, PA
Source Language: PAL III
Memory Required: 4K
Special Hardware Required: Requires a PDP-8/E, F, or M

Abstract: This is a modification of DECUS 8-533 which enables the program to function as a mini-disassembler or a "binary tape dump" program, depending on switch options.
The program will recognize and print field settings; no attempt is made to decode instructions, however.

Media Price Code: D2, G6 (Includes F)

LISP–8K **8-721**
Revised: June 1977
Author: Marton Zsenei,
Central Research Institute for Physics, Budapest, Hungary
Source Language: PAL III
Memory Required: 8K

Abstract: This is an 8K version of the LISP Interpreter (see DECUS No. 8-102). Only the differences are given in the documentation so it would be well to request the 8-102 write-up as well.

Media Price Code: A2, F5, G22

COMP.FT: Function Compare **8-723**
Author: R. L. Jensen,
Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN II and SABR

Abstract: An 8K FORTRAN function subprogram designed to compare two A6 fields for proper collating sequence and/or identity matching.

Media Price Code: D1, G5

Computer Catalog System **8-724**
Author: Preston M. Crabill,
Lehigh University, Bethlehem, PA
Operating System: OS/8
Source Language: FORTRAN II and SABR
Special Hardware Required: OS/8 Configuration with teletype and two DECtapes

Abstract: These three FORTRAN programs were prepared to enable better accessibility to catalog files and to allow speedier information retrieval.

8-724 (Cont.)

The WRITE program is set up to allow an operator to place catalog information on a specified file. The catalog information includes: catagories (a means of easy cross reference), vendor names, and key words pertaining to the vendor's catalog.

The MODIFY program enables an operator to ask for a specific reference number and modify it to his liking.

The SEARCH program allows easy information retrieval. Key words, vendor names, or catagories may be searched, and all of the information under pertinent reference numbers will be printed out on the teletype.

Media Price Code: D2, G14

The Pipe Stress Problem on a PDP-8/F 8-725

Author: Theodore E. Bridge,
54 Williamsburg Drive, Springfield, MA
Operating System: Paper Tape
Source Language: PAL
Memory Required: 4K PDP-8/F, ASR33
Other Software Required: 3 Page Floating Point Pkg (DECUS 8-375)

Abstract: This program may be used to calculate thermal expansion stresses in piping systems. It can handle multi-anchor systems with as many as 15 anchors. The program comes in two overlays. The first will edit and verify the input data, and draw a crude picture on the teletype to verify the geometry. The second will calculate stress and displacements at every point.

Media Price Code: A4, B5, F9

OS/8 Handler for the Varian Statos 21 Line Printer 8-726

Author: Ernest M. Stokely,
University of Texas Health Science Center, Dallas, TX
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: Varian Statos 21 Printer

Abstract: A two-page, OS/8 compatible handler for the Varian Statos 21 electrostatic line printer. The handler has been incorporated into the OS/8 monitor system and used for several months without problems.

Media Price Code: D2, F5, G6

DISASSEMBLER 8-727

Author: Jeff Nisler,
Submitted by: Doris J. Stoudenmire,
Walt Whitman High School, Huntington Station, NY
Source Language: PAL-III
Memory Required: 4K

Abstract: DISASSEMBLER is used to translate binary tapes to readable mnemonic symbols. It is a stand alone which may be used in a monitor system. Output is in two forms: 1) a source tape listing; 2) a pass 3 listing. A paging option is also available, as well as an option for HSR/LSR.

Media Price Code: D2, F5

MEND 8-728

Author: Jeff Nisler
Submitted by: Doris Stoudenmire,
Walt Whitman High School, Huntington Station, NY
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: 4K PDP-8, ASR33, PC08

Abstract: MEND gives options in copying, mending, and patch inserting with system tapes. It may be used alone or in a monitor system. More than one option may be requested during program execution.

Media Price Code: D2, F5

CORVU: A Display and Teletype Input/Output Program 8-730

Author: F. G. Oakham,
University of Toronto, Toronto, Canada
Operating System: Paper Tape
Source Language: PAL
Memory Required: 0-5, 6200-7611 for stand-alone program
Special Hardware Required: Tektronix 601 Storage Scope

Abstract: CORVU allows the user to examine and modify the contents of core of a PDP-8/E via the TTY in a manner similar to ODT. It can also display in octal form the address and contents of up to 128_{10} locations on a model 601 Tektronix storage oscilloscope. It operates under interrupt, and the basic program (not including interrupt and a dummy background program or options) occupies only three pages of core ($7000_8 - 7611_8$). Thus it is ideal for use with a large background program when core space is at a premium. A non-store option MOV1 is also available.

Media Price Code: D3, F9, G24

MEMO IV 8-731

Author: Gregory Ruth,
Charles Stark Draper Laboratory, Cambridge, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 5400_8 words

Abstract: MEMO IV is a program written for the OS/8 system to produce right- and left-justified paged text from free form text. The intention is to permit the user to produce a readable and neatly formatted document with minimal effort. This is a descendant of earlier programs MEMO and MEMO II (DECUS No. 8-427a–Removed). This version adds several new features, most notably the capability for directing output to any OS/8 compatible device (rather than restricting it to the teletype). Files written for previous versions of MEMO are compatible with MEMO IV.

Media Price Code: A2, F5, H32
Format: OS/8

BAVIRF: A Virtual File UDEF for OS/8 BASIC 8-732

Author: Stanley R. Vivian,
University of Manitoba Faculty of Medicine,
Winnipeg, Canada
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: This overlay to OS/8 BASIC permits random access to the data in up to four numerical files–which may be of fixed or variable length. The maximum file length can contain 170,080 floating point numbers. The two functions, GET(F,L) and PUT(F,L,V), will retrieve, or deposit a value V, from or into location L of file F. Variable files are automatically expanded as needed. Users may switch from random to sequential access and vice versa. Full error checking is included to diagnose attempts to: access idle or non-numeric files; GET or PUT beyond the end of file; and, access data not within locations 1 to 170,080.

Restrictions: It is uncertain which releases of OS/8 BASIC this overlay will work with.

Media Price Code: D2, G6, K27
Format: OS/8

RJE System for PDP-8/E (IBM 2780 Emulator) 8-733
Submitted by: William F. Decker,
University of Iowa, Iowa City, IA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 8K
Special Hardware Required: Card reader, printer, clock, and data communications options are required.
Other Software Required: OS/8 Needed to assemble source

Abstract: This program is designed to simulate an IBM 2780 communicating with an IBM 360/370 system running IBM OS/HASP software. The PDP-8/E RJE package currently supports a card reader, line printer, papertape reader punch, synchronous line unit and cyclic redundancy check option.

Characteristics of the software include: EBCDIC transmission code; Horizontal format record processing for printing; Multiple record buffers; Papertape reader/punch support; Transparency for transmission or reception.

The PDP-8/E RJE terminal can support several local functions such as: card-to-printer, printer-to-papertape, papertape-to-printer and papertape-to-papertape operations.

Media Price Code: A2, B8, E7, F8, H32, K54
Format: OS/8

Microprocessor Language Assembler for OS/8 8-734
Author: Robert Tedford,
Digital Equipment Corporation, Marlborough, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: This program is written in PAL-8 and requires the OS/8 operating system. It is a modified version of MLA, the cross-assembler for DEC's Microprocessor based on the Intel 8008 chip.

No source available.

Media Price Code: A2, F6

DSP8: Diagnostic Support Package for the PDP-8 8-735
Author: John C. Alderman, Jr.; Gwen N. McAllen
Submitted by: William H. Posey,
Digital Communications Associates, Inc., Atlanta, GA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 1600_8 words

Abstract: DSP-8 is a collection of useful subroutines and conventions for programming a small computer (the PDP-8 family, in this case), which specifically facilitates the task of the diagnostic programmer in creating diagnostics to test hardware peripherals for the system. Some considerable thought has gone into the writing of the specifications for the components of this package, and the experience of the authors in writing maintenance diagnostic is the major basis of the choice of available elements of this package.

Because the DSP8 source can only be assembled by a PS/8 or OS/8 configuration, the ASCII paper tape offered is for DSP8P, a PAL3 assemblable source file for smaller configurations.

Media Price Code: A2, B8, F5, G5, H32
Format: OS/8

Paper Tape Reader-Printer 8-736
Author: W. E. Hamilton,
Sunnyvale, CA
Operating System: Paper Tape
Source Language: PAL-III

Abstract: This is a utility used to "dump" the contents of an ASCII coded paper tape. The teletype is used for both input and output, however the high speed reader and/or a special Centronics printer may be used.

Codes such as "Line Feed," "Space" and "Rub Out" will be printed as "LF," "SP" and "DEL" respectively. PTRP does not actually execute the data being read in, thus it gives "honest" indication of what is "really" on the tape.

Media Price Code: A2, F5, G12

The Business Management Laboratory 8-738
Revised: June 1977
Author: R. L. Jensen,
Emory University, Atlanta, GA
Operating System: OS/8
Source Language: FORTRAN IV
Memory Required: 16K

Abstract: This simulation provides a variable (selectable) difficulty game which can be used as a supplement to a basic introduction course or as the heart of a demanding policies course. It integrates several functional fields (e.g. finance, marketing, accounting, operations) to provide a realistic management decision-making situation which does not require excessive time from the student. It permits transitions within the course from a very simple game at the beginning with additional complexities added as the course progresses. Highly flexible, the simulation is so designed that an instructor can make some individual modifications while using the same manual.

Restrictions: User manuals and instructor's manuals must be obtained from the author.

Media Price Code: A2, H64
Format: OS/8

COPY.PA 8-739
Author: Glen L. Brydon,
Glen Ridge, NJ
Submitted by: John W. Cowan,
Glen Ridge High School, Glen Ridge, NJ
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: TD8E/TU56 DECtape

Abstract: This OS/8 device handler allows OS/8 users with one TD8E DECtape drive as their system device to easily move files from one tape to another using OS/8 system programs such as PIP. COPY provides the single-DECtape user some fo the power of multiple-DECtape systems, at the expense of some time and effort changing tapes. It insures the integrity of transfers through an error recovery system which allows retries to be ordered if the handler was unable to read a damaged tape.

Restrictions: Limited error recovery

Media Price Code: A2, F5, G5

Theorem Prover for the Propositional Calculus 8-740
Author: Dr. A. K. Head,
C.S.I.R.O. Division of Tribophysics, University of Melbourne, Parkville, Australia
Operating System: Paper Tape
Source Language: LISP
Memory Required: 4K

Abstract: This is a complete LISP program with examples which runs under PDP LISP (DECUS 8-102). It considers proposed theorems in the

8-740 (Cont.)

propositional calculus and decides if they are true or false. It is based on the Wang algorithm and offers a choice of trace print out of steps involved in proving or disproving a theorem.

Media Price Code: A2, G5

SD8SY and SD8X: Two Handlers for the TD8E Simple DECtape 8-741

Author: W. van der Mark,
Swiss Federal Institute of Technology, Zurich, Switzerland
Operating System: OS/8
Source Language: PAL-8 V9B
Special Hardware Required: TD8E DECtape

Abstract: This package consists of two handlers to be inserted via BUILD.SV into the OS/8 V3 operating system. They are a replacement for the resident and non-resident TD8E DEC handlers. Both handlers will run with the interrupt switched on and will permit a data acquisition rate of 50 CPS.

Media Price Code: D4, H32
Format: OS/8

CLOCK: A Real-Time Clock/Calendar Routine 8-742

Author: P. K. Hastings and L. R. Tilley,
Catalytic, Inc., Charlotte, NC
Source Language: PAL-III
Other Software Required: Interrupt service routine

Abstract: A clock/calendar routine for keeping track of time in PDP-8 computers. This routine keeps up with minute, hour, day, month and a year. It was designed to be used with a real-time clock.

Media Price Code: D2, G5 (Includes F)

FILFIX: TSS/8 File Structure Repairing and Restructuring Program 8-743

Revised: May 1975
Author: Richard Wilson,
Digital Equipment Corporation, Maynard, MA
Operating System: TSS/8
Source Language: PAL-8

Abstract: FILFIX is a stand-alone utility program which analizes, repairs and restructures the files of any standard TSS/8 configuration. FILFIX enables a TSS/8 system to be rebuilt without losing the previous contents of the library on the system disk, and is also capable of correcting certain types of errors in the directory.

Media Price Code: A2, B4, F5

TSTCDR: TSS/8 Card Reader Diagnostic 8-744

Author: Richard Wilson,
Digital Equipment Corporation, Maynard, MA
Operating System: TSS/8
Source Language: PAL-8
Memory Required: 12K
Special Hardware Required: Card Reader

Abstract: This is a TSS/8 card reader diagnostic which is designed to run under TSS/8, version 8.24. The diagnostic makes use of standard alpha and binary test decks, either 40 or 80 column.

Media Price Code: D2, F5

LEP: Linear, Exponential and Power Function Curve Fit 8-745

Author: Pei nan Tsung, Ph.D.,
The Buffalo General Hospital, Buffalo, NY
Operating System: OS/8
Source Language: FORTRAN II

Abstract: Curve fitting for straight line, exponential curve fit, power function fit and e-exponential curve fit. The sample size of ordered pairs (x_i, y_i) is 30. All the calculations are based upon the method of least squares.

Media Price Code: D2, H32
Format: OS/8

Device Handler for Tektronix 611 Storage Scope 8-746

Author: Shlomo Z. Ron,
New York City Health and Hospitals Corp., New York, NY
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: KV8E and storage scope

Abstract: KV is a four page read and write non-file structured device handler under the OS/8 operating system. Since only 2 pages are allowed for an OS/8 device handler, the other two pages have to be in core in any 2 consecutive pages which are not destroyed by the program that uses this device handler.

Media Price Code: A1, G6

STAGE2 Macro Processor 8-747

Author: Jonathan Gross and W. M. Waite,
University of Minnesota and University of Colorado
Operating System: OS/8
Source Language: PAL-8 and STAGE2
Memory Required: 12K to 32K
Special Hardware Required: PDP-8E, F, or M with EAE

Abstract: STAGE2 is a general purpose macro processor designed by W. M. Waite, and may be used as a front end to other languages such as SABR, FORTRAN and BASIC. Device independent I/O, and access to several files allows for flexible processing and multiple passes within the macro processor. Macro calls are recognized by a pattern matching scheme that allows for flexible syntax in macro definition. The special characters controlling the macro processor may be easily defined so that they do not interfere with the host language. Handles upper and lower case, and control characters. STAGE2 is itself written in a language (FLUB) that is translated by STAGE2 into PAL-8.

Media Price Code: B16, E12, F12, G52, K27
Format: OS/8

UFAX08: A LAB-8 (AX08) Set of User-Defined-Functions for OS/8 BASIC 8-749

Author: Stanley R. Vivian,
University of Manitoba Faculty of Medicine, Winnipeg, Manitoba, Canada
Operating System: OS/8
Source Language: PAL-8

Abstract: The standard LAB-8/E user-defined-functions distributed with OS/8 BASIC, V3, have been modified to function on the original LAB-8 (PDP-8 with AX08 laboratory peripheral). The general philosophy of these modifications has been to make them in such a way that programs that run on the LAB-8/E will also run on the LAB-8 (AX08) without changes. The functions, their argument structures and execution logic are essentially the same as in the LAB-8/E version as documented in the OS/8 Handbook–DEC-S8-OSHBA-A-D.

8-749 (Cont.)

Major differences are: 1) CLK–prints setting of RC clock; 2) SAM–will not sample digital registers; 3) DRI–reads contingency bits; 4) DRO–sets or clears digital outputs.

Media Price Code: A2, B3, G18

Paper Tape Display **8-750**
Author: Thomas Ford
Submitted by: Jeffrey A. Merrow
White Mountains Reg. High School, Whitefield, NH
Operating System: Paper Tape
Source Language: PAL-III
Memory used: 164_8 words

Abstract: This program, designed for display purposes, was originally produced by Thomas J. Ford using FOCAL 5/69 and will type each tape punch as six characters long, and four high, except for the sprocket holes, which are four characters long as well as high.

Media Price Code: D2, F5

FORTRAN IV for OS/8 FORTRAN II Users **8-751**
Author: John Cowan
Glen Ridge High School, NJ
Operating System: OS/8
Source Language: FORTRAN II, SABR

Abstract: FORTRAN IV for OS/8 FORTRAN II Users is a manual of implementations and subroutines simulating most of the features of standard and OS/8 FORTRAN IV, with the exception of double-precision routines. These routines will not work under the paper tape FORTRAN. INVENT-8 (DECUS8-610) and DPARITH (DECUS 8-597.12) are assumed: that is, they are not used, but features they provide have not been duplicated.

Media Price Code: D2

MIG8E2: Monitor of Interruptions Which are Generated by the PDP-8/E Peripherals **8-752**
Author: Alain Beysen
SNECMA, Centre de Etudes de Villaroche, Moissy Cramayel, France
Source Language: PAL-III or PAL-8
Memory Required: 4K
Special Hardware Required: PDP-8E

Abstract: This general purpose program will handle the priority scheduling of different I/O devices, with a minimum of disturbing time. It provides: hardware and software interrupts, 12 levels of priority plus background plus interrupt off, saving all active registers (including arithmetic and memory extensions) plus one memory, loading in 3 pages of core plus 16 memories page 0 in field 0, queuing low levels of priority, masking interrupts if wanted, high speed servicing—and no bugs—hopefully.

Note: Documentation and listing comments are in French.

Media Price Code: A2, H32
Format: OS/8

OS/8 System Output Handlers **8-753**
Author: G. Chase
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: Teletype or equivalent

Abstract: These handlers simulate (LT, T4) line-printer output on a teletype or equivalent terminal. LPT was written to handle an actual line-printer, or—especially—matrix printers such as the Centronics LS8E.

Media Price Code: A2, B2, F5, H32
Format: OS/8

NUMBER and REDATE–OS/8 File Utility Programs **8-754**
Author: G. Chase
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8 V3
Source Language: PAL-8
Memory Required: 8K

Abstract: These programs help to facilitate the handling of certain OS/8 files that are in some way peculiar, e.g. in having no file date or a bad file date, or in containing illegal characters in name or extension.

Media Price Code: A2, B2, F6, H32
Format: OS/8

ASCON: ASCII File Converter **8-756**
Author: Steven Zimmerman,
Boston V.A. Hospital, Department of Nuclear Medicine, Boston, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: This program takes a standard 64 character ASCII file of the type produced by EDIT and translates it into a 96 character ASCII file. It is primarily intended for taking text which is all upper case and translating it into standard upper and lower case, usually for eventual output to a line printer.
ASCON is particularly powerful in combination with MEMO IV (DECUS 8-731).

Media Price Code: A1, F5, H32
Format: OS/8

OS/8 Utility Package **8-757**
Author: A. Windram
Submitted by: L. C. Chapas
Grasslands Research Institute, Berkshire, England
Operating System: OS/8
Source Language: PAL-8 and SABR
Memory Required: 8K

Abstract: This package consists of the following programs:

CORMAP–will produce a map for binary files showing where they load in memory. It is an alternative to OS/8 BITMAP, and offers more concise output and additional facilities. Both absolute and relocatable binary files can be mapped.

FORMAT–allows program tapes to be prepared off-line, and then converted to a standard on-line format. Strings of spaces are replaced by tab characters in a more intelligent way than EDIT, and some reformatting is done.

FIXCD–one-time program to fix several known bugs in Command Decoder (PS/8 and OS/8 V1 and V2 only).

XDIREC–selectively lists files by file-names or extensions. Options allow listing of up to 8 additional information words, listing of core-control blocks for core-image files, and listing of FORTRAN II library directories.

8-757 (Cont.)

FHANDL–allows file-handling in normal or special mode of Command Decoder, using block-, word-, or character-oriented transfer, with the ability to handle several input and output files simultaneously.

F2SUB–the first 5 modules will run on any PDP-8 processor. The 6th requires a PDP-8/E, and the 7th a PDP-8/E with EAE.

1. MOVE–Allows moving or zeroing of real or integer arrays be means of a single subroutine call instead of a DO loop. Needs 1 page.

2. MKRSET–Gives direct-access handling for Stream 4 input. Needs 1 page.

3. ICARD–A routine for reading cards in binary. Needs 1 page.

4. UTIL–This is the OS/8 V1 UTILITY module, with an incore encode/decode facility added. Binary only. Needs 4 pages.

5. FFFINP–Free-format input package for numeric and character input, and character comparison, using any stream. Needs 5 pages.

6. RWIOH–This is the OS/8 V1 READ/WRITE/IOH module, modified to output even-parity characters. Binary only.

7. LOGIC–Provides 9 logic functions (AND, OR, NOT, SIDE-ADD, SHIFT-LEFT, SHIFT-RIGHT, SET BIT, CLEAR BIT, TEST BIT). Needs 1 page.

Media Price Code: A2, H32, K27
Format: OS/8

Super Hardware Bootstrap Code for the TC08/TC01 on an MI8E **8-758**

Author: Ricky Schrieber/Charles Lasner
Forest Hills, NY
Source Language: PAL-8

Abstract: Due to the hardware implementation of the MI8E bootstrap loader, it is necessary for the option to ground PWR NOT OK to cause a power clear sequence. On the RK05's this causes the heads to retract in case of a real failure, so to cover up for this and to leave a message logged on the console TTY a hack was made to have it type INITIALIZING then wait for the drive and do a standard OS/8 RK8E bootstrap.

Well, here is one for the TC08/TC01 that will rewind unit 0, print the message INITIALIZING and then proceed to bootstrap to what looks like a standard TC01 bootstrap.

Note: Might fail MI8E diagnostic due to self-modification

Media Price Code: D2, F5, G5

USLIBA: FORTRAN II Subroutines for Binary Data Transfer **8-759**

Author: Albrecht Lommel,
Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland
Operating System: OS/8
Source Language: SABR

Abstract: USLIBA contains five SABR-written subroutines which are useful on evaluating absolute integer binary data in FORTRAN II.

DATAM prints the OS/8 date, ADFAC helps users with an A/DC to evaluate their conversion factor: A/DC integer value to real voltage, DCHAN stores integer data from DF 2 into the "COMMON" area in DF 1, ADCOM combines ADFAC and DCHAN, storing the real voltages of integer A/DC values from DF 2 into the COMMON area in DF 1, RDATA finally reads integer data from the OS/8 SYS device from a file into core. These data files can be created by means of another program also available from DECUS: "WDATA"–DECUS 8-761.

Media Price Code: D3, F5, G16

FASTAD: User Oriented Data Collection on One A/DC Channel **8-760**

Author: Albrecht Lommel,
Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland
Operating System: OS/8
Source Language: PAL-8
Memory Required: 12K
Special Hardware Required: Real Time Clock 'DK8-EP'; An A/D converter 'AD01-AP' or other A/DC types with multiplexer; OS/8 configuration are not necessary but an advantage
Other Software Required: DEC's Floating Point Package (EAE or NONEAE) (DEC-8E-NEAEA-A-PB) or (-08-NFPPA-A-PB); TTYIO(DECUS 8-762); For OS/8 users: WDATA (DECUS 8-761) and USLIBA (DECUS8-759) strongly recommended

Abstract: FASTAD is a program for user-oriented data collection on one A/DC channel with one big buffer. Up to 4K core can be filled with A/DC samples.

Media Price Code: A10, B6, F10, G50

WDATA: Subroutine to Write Absolute Binary Data on SYS-Device **8-761**

Author: Albrecht Lommel
Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland
Operating System: OS/8
Source Language: PAL-8
Memory used: 3 pages
Other Software Required: USLIBA (DECUS No. 8-759)

Abstract: WDATA is a subroutine for writing absolute binary data on the OS/8 SYS-device.

Format: Sequential blocks of 400_8 data words per block.

By means of 'USR' the user opens his data-file and then WDATA writes the buffer contents to the sys-device (start address, field, and length of buffer programmable). For subsequent calls to WDATA no new data-filename is necessary; WDATA keeps track of the block-numbers. Furthermore, it examines if the buffer length corresponds to an even number of pages, if the sys-space available is sufficient for the next buffer output (if not, a correction will be done of the amount of output together with a correction message), and it asks after a successful buffer-output if you want to transfer any more data. If your output has been ended it will print out the complete filename (with the extension ".EX") and its total block length.

Evaluations of these data having been stored on sys by WDATA can be made in FORTRAN II by means of the program USLIBA (DECUS 8-759).

Media Price Code: D2, F5, G10

TTYIO: I/O Routines for Teletype or Similar Terminal **8-762**

Author: Albrecht Lommel
Institute of Aerodynamics ETH, Swiss Federal Institute of Technology, Zurich, Switzerland
Source Language: PAL-III

Abstract: This package contains programs necessary for a good communication with the terminal. TYPX prints messages, six bit ASCII.

KREAD reads messages from keyboard, GETBUF prints them out (both use a buffer for the eight bit ASCII characters) as a mere message or forms an octal number of sequential characters. DBCONV converts ASCII-coded decimals to binary numbers, DECPRT prints up to 4 digit decimal numbers of a binary number in AC.

HEAR is a special form of KREAD for a fix text buffer, GETKBD is the corresponding GETBUF for a fix buffer.

8-762 (Cont.)

The routines require 2 pages of core and can be used field independent via some special routines listed in the comment. They all use the same exit (1 loc. in page 0). KREAD, TYPS, DBCONV and DECPRT are adaptations from DEC's Commonly Used Utility Routines.

Media Price Code: D2, F5, G8

KL8TST: KL8/E, KL8/J Diagnostic **8-763**
Author: David A. Bennett
Computer Science Research Laboratory, The Technological Institute, Evanston, IL
Source Language: PAL-D or PAL-8
Memory Required: 663_8 words

Abstract: KL8TST verifies the correct operation of a KL8/E or a KL8/J asynchronous serial device controller. In an environment where a particular board must quickly be isolated as the possible source of some unknown difficulty, or in general when a vote of confidence is needed on a KL8/E or /J irrespective of the peripheral which it controls, this program will give a fast go no/go response.

Should the program discover a fault, it attempts to report its nature in meaningful English language phrases. It will perform independent tests of 1) interrupt capability, 2) punch complete flag operation, 3) keyboard ready flag operation, and 4) data integrity.

Media Price Code: D2, G6

LIST **8-764**
Author: P. C. Diegenbach
Zoological Laboratory, University of Amsterdam, Amsterdam, The Netherlands
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: Tektronix 4010 Display Terminal

Abstract: This program gives a listing of an OS/8 file on the Tektronix 4010 terminal with optional hardcopies on the 4020 hardcopy device or on the teletype of DECwriter. Paging after a form feed is switch selectable too. Default extension for the file is .DA. It uses the PS8IN subroutine (DECUS 8-472) (PS8IN is included with the source).

Media Price Code: D2, F5, G12

DUMPOS: Dumps OS/8 ASCII Files **8-765**
Author: Meluyn George Fishel
Free University Brussels, Brussels, Belgium
Operating System: OS/8
Source Language: PAL-8, PAL-III
Memory Required: 1K

Abstract: Program DUMPOS is a very useful dump program in case of system or directory crashes with OS/8 DECtapes. DUMPOS will dump any OS/8 ASCII file on the ASR33, even if the system area or the directory has been destroyed. Block number of file to be dumped is entered manually via the switch register.

Media Price Code: D2, F5, G5

SIMBA: A PDP-8/E Oscilloscope Symbol Generator **8-766**
Author: Meluyn George Fishel
Free University Brussels, Brussels, Belgium
Source Language: PAL-8, PAL-III
Memory Required: 400_8 words
Special Hardware Required: EAE and VC8E Oscilloscope.

Abstract: SIMBA is a fast, two-page oscilloscope character generator. A 6×4 dot matrix is used to generate the symbols. The subroutine takes care of full-line, full-page and end-of-file conditions. Tab characters are automatically expanded.

Media Price Code: D2, F5, G5

EDAS: Editing and Assembling System **8-768**
Author: Melvyn George Fishel
Free University Brussels, Belgium
Operating System: Paper Tape
Source Language: PAL-III, PAL-8
Memory Required: 8K

Abstract: EDAS is an editing and assembling system, based on Symbolic Editor (DEC-08-ESAC) and PAL III Assembler (DEC-08-LPALA). EDAS requires 8K of core memory. PAL programs are edited with the text editor in field 0 and can be immediately assembled from Editor's text buffer with the assembler residing in field 1. After each assembly pass the program returns control to the editor so that corrections can be done without time-consuming paper tape handling.

Media Price Code: D2, F6, G5

SELFDR: The Selfdrill Program, 8K Version **8-769**
Author: Francis M. Wheeler
Beloit College, Beloit, WI
Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 8K
Other Software Required: OS/8 required for assembly.

Abstract: The purpose of this package is to provide a series of general-purpose learning algorithms accessible to the individual learner. The idea behind the program is to organize and animate the study process, and to give the learner a sense of power and of progress in pursuing his task in a way uniquely suited to his or her personal needs, preferences, and abilities. The program may be used either in conjunction with some kind of formal instruction, or as an independent mode of study. This program was written to work with an ASR33 (non-parity) Teletype.

Note: See also DECUS No. 8-656.

Restrictions: Requires modification for use on parity terminals such as most DEC terminals.

Media Price Code: A2, B12, H32
Format: OS/8

MOSS: 4K TD8E DECtape System **8-770**
Author: Simon Young and Ben Lewis
Christ's College, Christchurch, New Zealand
Source Language: PAL-III
Special Hardware Required: TD8E DECtape, PDP-8/E, F, or M

Abstract: MOSS (Monitor/Operator for Small Systems) is designed to be a bridge between a 4K PDP-8/E with teletype using paper tape as the I/O modem, and a 8K PDP-8/E with MR8EC ROM and TD8E DECtape which uses OS/8.

MOSS works on 4K PDP-8/E with or without ROM, a single drive TU56 with TD8E control and ASR33 teleprinter.

The system has a keyboard Monitor, an assembler, an editor, a DECtape ODT, a DECtape Binary Loader, a version of 'FOCAL' and a disassembly program all of which work from DECtape.

Restrictions: Works only in 4K

Media Price Code: A2, H32
Format: Unspecified

PRGSCH: TSS/8 Program Searcher 8-771

Author: Herbert Kay
Belmont High School, Belmont MA
Operating System: TSS/8
Source Language: PAL-D

Abstract: PRGSCH, when given the name of a program, will search a predetermined set of accounts for it. If it is found, the account number, extension, protection, and size are printed. If the program is read and write protected against the current account, only the account number and "PROTECTED" are typed.
A subroutine at 1237 allows for appending, deleting, and listing the accounts to be searched.

Media Price Code: D2, G8

OS/8 Compatible VC8-E Handler for Mass Storage Systems 8-772

Author: Stephan V. Bechtolsheim,
Ulrich Gschrei; Max-Planck Institut fuer Psychiatrie, Munich, West Germany
Operating System: OS/8 V3
Source Language: PAL-8
Memory Required: 12K minimum
Special Hardware Required: VC8E interface with Tektronix 611 or 613 storage scope

Abstract: An OS-8 (12K) compatible scope handler for a PDP-8/E with a VC8E interface for the storage scope Tektronix 611 or 613 and EAE option. It can be assigned like a lineprinter. No additional hardware is required. Character display is via 5 × 7 matrix and effected by a one page handler cooperating with a co-resident fixed area of 4 pages containing character table and display organization (PAL8). Arbitrary character position in FORTRAN 2 is possible. Furthermore for the system program EDIT an option is implemented to direct TTY responses to the scope.

Media Price Code: D2, H32
Format: OS/8

Graphics Package for the Tektronix 4010 Under OS/8 8-773

Author: James Lerner
Union College, Schenectady, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K
Special Hardware Required: Tektronix 4010 Display Terminal

Abstract: The graphics package consists of four main programs, each in communication with the rest. Using a 1-letter interactive code, it is possible to graph 3-dimensional equations, draw any regular closed polygon, draw straight lines, and perform rotation and scaling operations. One of the programs is used strictly for I/O on the system DECtape, while another has very powerful editing capabilities.

Media Price Code: A2, H32
Format: OS/8

Simple ASCII Editor and Tape Reproducer 8-774

Author: Bradford A. Morse
Beverly High School, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: This is a very simple editor for use on the PDP-8/E computer with one ASR or KSR 33 teletype. The main program resides on the first two pages of core memory, leaving the rest of the core for the storage of user programs or tapes to be copied. The editor works much like a normal teletype 'off line' (local). But your program is stored, and can later be either printed/taped or erased. All characters on the keyboard are stored except the 'Line Feed' which is automatically placed after all eight bit return codes.

Media Price Code: D2, F5, G5

COPIER 8-775

Author: Paul Aitkenhead
Hingham High School, Hingham, MA
Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 12K
Other Software Required: May require OS/8 for assembly

Abstract: Design, operation and limitations of a program which generates multiple copies of text are presented. The program forms a configuration of machine instructions which reads characters from one device and echoes them on a number of output devices. An output buffer system eliminates loss of characters due to different operating speeds on the input and output devices. The user selects the desired devices and controls program operation through the main console terminal.

Media Price Code: A2, G5

PFCF: Polynomial Function Curve Fitting 8-778

Author: Pei-nan Tsung, Ph.D.,
The Buffalo General Hospital, Buffalo, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 8K

Abstract: This program is written in FORTRAN II language and contains polynomial function curve fitting of degrees 5, 4, 3, 2, and 1. The sample size of ordered pairs $(x_i, y_i,)$ is 30. All the calculations are based upon the method of least squares.

Media Price Code: D2, H32
Format: OS/8

TC58.PA: OS/8 Version III Device Handler for TC58 Magtape 8-779

Author: Peter Lemkin and Gerson Grosfeld,
National Institutes of Health, National Cancer Institute, Bethesda, MD
Operating System: OS/8 V3B
Source Language: PAL-8
Memory Required: 2 pages
Special Hardware Required: TC58–TU20/TU10 Magtape.

Abstract: This is a magtape handler for OS/8 "BUILD.SV" for the TC58-TU20/TU10 drives. The controller is set for 900 BPI, 9-track, odd parity, core dump mode.
It should be noted that the TC58 status word is different than that for the TM8E, thus causing problems with DEC software. Instructions are given for determining status.

Media Price Code: D2, H32
Format: OS/8

SPLIT and SPLICE **8-780**
Author: G. Chase
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: These routines make it possible to split a very long file into a number of subfiles on separate "volumes" (DECtapes, diskettes) and later to splice the subfiles back into a fair copy of the original very long file.

Media Price Code: A2, B3, F8

DOCRLN: A Subroutine to Calculate Polarity-Quantized Autocorrelograms **8-781**
Author: J. S. B. Clark,
Agricultural Research Council's Poultry Research Center, Edinburgh, Scotland
Source Language: PAL-D
Memory used: 110_8 words
Special Hardware Required: See abstract

Abstract: The subroutine may be called to calculate the y–ordinates of a polarity–quantized autocorrelogram in real-time. It is intended for use on a PDP-8 processor with A/D converter or zero-level crossing detector, real-time clock and visual display. The execution time lies between 20 μsec/sampled point and 10 μsec/sampled point depending on several options described. The subroutine is called once between samples of signal, and updates a single precision store which may be output directly on to a visual display unit as an autocorrelogram.

Media Price Code: D2, F5, G5

DEVHND: Device Handler for Storage Scope Using AX08 (LAB-8) as Controller **8-782**
Author: Robert V. Kenyon, Jr.,
University of California, Berkeley, CA
Operating System: OS/8 V2
Source Language: PAL-8
Memory Required: 2 pages
Special Hardware Required: AX08 and EAE

Abstract: DEVHND is a two-page OS/8 version II scope handler which uses the AX08 (LAB-8) peripheral to simulate a line printer of a storage CRT. The handler displays one page (screen) at a time. (A page ends when a form feed is encountered or when the bottom of the screen is reached.)

Media Price Code: D2, F5, G5

EDITV: Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III **8-783**
Author: Robert V. Kenyon, Jr.,
University of California, Berkeley, CA
Operating System: OS/8
Source Language: PAL-8
Memory used: 4 pages
Special Hardware Required: AX08 Lab Peripheral

Abstract: EDITV is an OS/8 Symbolic Editor patch which is used with EDIT Version III in order to output lines of text or an entire text buffer, page by page, on a storage scope using the AX08 (LAB-8) peripheral. The text is written on the scope when the V command is received.

Media Price Code: D2, F5, G9

TSS/8 TTRACE and TSS/8 LTRACE **8-784**
Author: Clark S. Donley, Ph.D.,
Medical University of South Carolina, Charleston, SC
Operating System: TSS/8
Source Language: PAL-D
Memory used: 3 pages

Abstract: TSS/8 TTRACE is a modification of Eberhard Werner's TRACE (DECUS 8-95) for use with TSS/8. Input is from teletype rather than the switch register. Various commands are available to permit restart with input of only those parameters which are to be changed.
TSS/8 LTRACE is a version of TSS/8 TTRACE for output on the line printer.

Note: DECtape includes DECUS 8-785, and 8-786.

Media Price Code: D2, H32
Format: TSS/8

GPATCH **8-785**
Author: Clark S. Donley, Ph.D.,
Medical University of South Carolina, Charleston, SC
Operating System: TSS/8
Source Language: PAL-D
Other Software Required: TSS/8 EDIT program

Abstract: This patch to TSS/8 EDIT provides a more useful G command. It searches for the line beginning with a search string of characters of arbitrary length. It outputs the line number of this line and resets "." to it.

Media Price Code: D2, H32 (Order DECUS 8-784 DECtape)

TSS/8 FORMAT **8-786**
Author: Clark S. Donley, Ph.D.,
Medical University of South Carolina, Charleston, SC
Operating System: TSS/8
Source Language: PAL-D
Memory Required: 4K

Abstract: A TSS/8 version of Digital-8-21-U-Sym, Symbolic Tape Format Generator program using disk for input and output. It formats symbolic PAL programs created by EDIT.

Media Price Code: D2, H32 (Order DECUS 8-784 DECtape)

RKCOPY **8-789**
Author: Mark D. Himes,
Digital Equipment Corporation, Rolling Meadows, IL
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: 2 RK05 disk drives

Abstract: RKCOPY is designed to facilitate copying entire disk packs between any two disk drives on an RK8E or RKS8E compatible disk system. In addition, verification of data copied is made possible as well as the capability of comparing any two disks for differences in data formats. Minimum core allocation and minimum execution time were the two main factors strived for in this program.

Note: Copies the entire disk only. No partial copies.

Media Price Code: A2, F5, G10

PROVE-8, V.03 8-792

Author: A. David Leach
Farnborough, Hampshire, England
Source Language: PAL-8
Memory Required: 4K

Abstract: The art of Campanology, or church-bell ringing in the English manner, uses a traditional form of music based on mathematical rules. One of the rules is that no permutation of the bells may occur more than once in a composition. To prove this by hand can be a long, tedious process.

PROVE can handle compositions of up to 500 leads in any single-hunt method, plain or otherwise, on up to 12 bells.

A composition is entered in the standard format on the teletype, and the PDP-8 interrupts to print the details of any repetition.

Media Price Code: A3, B4, F5

RANF: A Pseudo-Random Number Generator for OS/8 FORTRAN IV 8-793

Author: Jonathan Gross
University of Minnesota, Minneapolis, MN
Operating System: OS/8
Source Language: RALF
Memory Required: 133_8 words
Special Hardware Required: EAE
Other Software Required: OS/8 FORTRAN IV

Abstract: This is a FORTRAN IV random number function that returns a number in the range of 0 to 1. It is based upon the generator by Dunsby and Walker, DECUSCOPE, Vol. 14, Number 3. Also included is a seeding subroutine, RANSET.

Media Price Code: D2, G5

IFAC: A FORTRAN Program for Parameter Estimation 8-794

Author: Hans-Dieter Wierum
Institut fuer Kerntechnik Technische Universitat Berlin, Berlin, Germany
Operating System: OS/8
Source Language: FORTRAN II, PAL-8
Memory Required: 12K
Special Hardware Required: AX08 Lab Peripheral

Abstract: This program consists of four source programs, IFAC, GAUSS, BINOM and PULSAD. The main program IFAC computes matrixes and vectors which are needed for a least squares analysis. The subroutine GAUSS solves a linear equation system, i.e. the matrix equation A.X = Y for X. The elements of the result vector X are the parameters of the discrete transfer function. The subroutine BINOM computes the vector PAR from the vector X. The elements of the vector PAR are the parameters of the continuous transfer function. The data acquisition of the input-and-output-signals is carried out in real time by the subroutine PULSAD.

Media Price Code: D2

RINROT: A Roll-in, Roll-out Program 8-795

Author: Wayne Teeter and Harold E. Cronin
Naval Weapons Center, China Lake, CA
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: TM8E magtape and RK0S/RK8E disk.

Abstract: RINROT is a roll-in, roll-out program used to save an RK8E cartridge disk on TM8E 1/2" magtape or restore the disk from the magtape. A starting address of 0200 reads the disk and writes the disk data in 1024 word blocks on the magtape. A starting address of 0400 reads the magtape and writes 256-word blocks on the disk.

Media Price Code: D2, F5, G5

Five Word Floating Point Package for PDP-8 8-796

Author: Douglas L. Martin
National Research Council of Canada, Ottawa, Canada
Source Language: PAL-III
Memory Required: 4K

Abstract: The package operates in the interpretive mode, performing calculations with an accuracy of 14 to 15 significant digits. It includes input and output routines, the latter permitting variable word length fixed and floating point outputs. Input and output are possible within a set of floating point instructions which also include add, subtract, multiple, divide, square, square root, normalise, negate and absolute value. The package occupies core areas 5-7, 15, 40-64 and 5463-7543.

Note: Numbers range from 10^{-38} to 10^{+38} in magnitude.

Media Price Code: A2, B3, F5, G22

LSPCF: Least Squares Polynomial Curve Fitting Program 8-797

Author: J. deBoer and Douglas L. Martin
National Research Council of Canada, Ottawa, Canada
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Other Software Required: DECUS No. 8-796

Abstract: The program uses Bjorck's Modified Gram-Schmidt orthonormalising process. It will least squares fit a power series of up to 17 terms (ranging from power −4 to power 21) to a number of data point pairs exceeding the number of terms in the series but otherwise unrestricted. This is done using a basic 4K-core PDP-8 with no peripherals apart from the ASR33 Teletype but a special 5-word floating point package must be used. The first pass of the data tape produces the power series coefficients. An optional second pass produces the deviations of individual points from the fitted series and the error limits of the coefficients.

Media Price Code: A2, B3, F5, G24

OS/8 to RSTS Interface 8-798

Author: R. J. Tapp
University of Victoria, Victoria, B.C. Canada
Operating System: OS/8 V3
Source Language: PAL-8
Memory Required: 1 page
Special Hardware Required: KL8-J and DL11-C Serial Interfaces

Abstract: Consists of an OS/8 device handler and a BASIC-PLUS program which make a KL8 serial interface emulate an OS/8 disk when connected to a RSTS terminal port. This allows serial lines from a RSTS system to provide inexpensive supplementary mass storage for satellite OS/8 systems.

Media Price Code: D2, G10

Dose Calculation of Irregular Fields 8-799

Author: Pei-nan Tsung, Ph.D.
Buffalo General Hospital, Buffalo, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 12K

8-799 (Cont.)

Abstract: The dose calculation of irregularly shaped fields for therapy treatment planning using Co-60 and 4MV linac radiation has been accomplished by writing and utilizing a routine digital computer program algorithm.

Media Price Code: D2, H32
Format: OS/8

Heat Loss Calculation 8-800
Author: Theodore E. Bridge
Springfield, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: ASR 33 Console

Abstract: This program was designed to make a straightforward heat loss calculation very much as you would make one manually. You could make such a manual calculation almost as quickly, but his program will leave a printed record of all parameters used. For checking, a manual calculation must be repeated. The machine calculation can be checked by scanning the output.

Media Price Code: D2, F6

MORSE: Morse Code Coder and Decoder 8-801
Author: Bruce Filgate
Digital Equipment Corporation, Marlboro, MA
Source Language: MLA (Module Language Assembler)
Memory Required: 1200 decimal locations
Special Hardware Required: MPS Microprocessor

Abstract: This program was created on a PDP-8, to generate and decode Morse code when executed by the MPS (8008-1). The program can handle code speeds from 7.2 WPM to 80 WPM. Input is via a sense line, output is on a drived line. The Logic Products starter set contains the required CPU configuration. Input decoding is self tracking as to code speed.

Media Price Code: A2, B3, F5, G18

SSP: Scientific Subroutine Package 8-802
Author: Sandia Labs (IBM) and H. David Todd
Submitted by: Robert Hassinger
Liberty Mutual Research Center, Hopkington, MA
Operating System: OS/8
Source Language: FORTRAN IV
Memory Required: 8K

Abstract: The Scientific Subroutine Package (SSP) is a collection of over 250 FORTRAN subroutines divided, for the sake of presentation, into two groups: statistics and mathematics. Also, over 200 subroutines are presented in both single and double precision mode. SSP is a collection of input/output-free computational building blocks that can be combined with a user's input, output or computational routines to meet his needs.

Note: Users who purchase this package must have their own documentation, or have the IBM SSP Manual #GH20-0205-4.

Media Price Code: (Order 8-802A, 802B, or 802C)

SSP: Single Precision Routines without Comments 8-802A

Abstract: The files in this package include single precision routines only. All comments have been removed from the source files so they can be supplied on the fewest number of tapes or diskettes.

No write-up available.

Media Price Code: H32, K54
Format: OS/8

SSP: Double Precision without Comments 8-802B

Abstract: The files in this package include double precision routines only. As in 8-802A, all comments have been removed from the source files so that the package can be distributed on a single tape or diskette. Users must have their own documentation.

No write-up available.

Media Price Code: H32, K27
Format: OS/8

SSP: Complete Package with Fully Commented Sources 8-802C

Abstract: This package includes all the files from both 8-802A and 8-802B with all comments from the original DECsystem-10 package. Users who order 8-802C need not order the other two packages.

Note: Additional documentation (see DECUS 8-802) may be required in order to utilize all the programs in this package. This documentation is not available from DECUS.

No write-up available.

Media Price Code: H160, K216, Q145
Format: OS/8

FOLMAT 8-803
Author: G. Chase
Portsmouth Abbey School, Portsmouth, RI
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: There exists a DEC Program, "FORMAT". It takes a Binary File (.BN) for input and outputs a paper tape which can be loaded and auto-started by the Rim Loader. FOLMAT was created to meet several needs: faster loading; a better binary loader that will reject false codes; the avoidance of high-order bit pick up; a built in readable punch (64-char. set) for the "head"; ability to omit the auto-loader, or to transfer ASCII files.

Media Price Code: A1, F5, G5, H32
Format: OS/8

MUSIC: PDP-8 Music Playing Program 8-804
Author: Richard Wilson and others
Digital Equipment Corporation, Maynard, MA
Operating System: Paper Tape or OS/8
Source Language: PAL-8
Memory Required: 4K

Abstract: MUSIC is a program which will play music in four part harmony on any PDP-8 family core memory computer, except the 8/S or PDP-12. The music to be played is input to the program as a standard OS/8 ASCII file. The music may be picked up by the use of an AM radio, or by a simple interface. The OS/8 distribution media include the source of the player, which can be customized for various configurations, along with approximately 45 minutes of music, such as Joplin, Bach, Beethoven, movie tunes, etc.

The binary paper tape is intended for any 1.5 microsecond PDP-8, and runs in 4K, but will only play short tunes. Several short tunes are available on paper tape.

Media Price Code: A2, F5, H32, K54
Format: OS/8

The Entertainer **8-804.1**

Note: Included with 8-804 DECtape/Floppy

Media Price Code: G8

Love Will Keep Us Together **8-804.2**

Note: Included with 8-804 DECtape/Floppy.

Media Price Code: G8

Minute Waltz **8-804.3**

Note: Included on 8-804 DECtape/Floppy.

Media Price Code: G8

Bach, Inventions **8-804.4**

Note: Included on 8-804 DECtape/Floppy.

Media Price Code: G8

PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and Punch **8-805**

Author: Guy Schayes
University of Lauvain, Lauvain-la-Neuve, Belgium
Operating System: RTS-8
Source Language: PAL-8
Memory used: 256 words
Special Hardware Required: High speed paper tape
Other Software Required: OS/8

Abstract: This handler is to be used under RTS-8 executive (DEC NO. QF020) and drives the paper tape reader and punch in a manner quite similar to the DEC Terminal Handler task.

Media Price Code: D2, G6

SAC8: Simulation of an Analogue Computer **8-806**

Author: H. W. Ridder
Radiologiezentrum der Philipps-Universität Marburg, Germany
Operating System: 4K Disk Monitor System
Source Language: PAL-D
Memory Required: 4K
Special Hardware Required: Floating Point Pkg (DEC-8-5B-S or equivalent)

Abstract: This program computes the solution of maximal 8 simultaneous, first-order, linear, homogenous differential equations with constant coefficients. It simulates an analogue computer with 8 integrators.

Restrictions: Tested only on the PDP-8/S

Media Price Code: D3, F5, G8

Probability Density Functions of Analogue Signals with the LAB-8 System **8-808**

Author: Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin, Germany
Source Language: PAL-8
Special Hardware Required: Lab-8 System
Other Software Required: Floating Point Pkg (DEC-08-YQ2B-PB)

Abstract: This program will perform the probability density of an analogue x(t).

No source available.

Media Price Code: A2, F5

FFT or IFFT of an Analogue Signal with the LAB-8 System **8-809**

Author: Klaus Lickteia
Institut fur Kerntechnik, Technische Universitat Berlin, Germany
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: Lab-8 System
Other Software Required: Floating Point Pkg (DEC-08-YQ2B-PB)

Abstract: The FOURIER transform or inverse FOURIER-transform of an analogue signal is calculated.

Media Price Code: A2, B10, F6

DYNOD: DYNAMIC OCTAL DEBUGGER **8-811**

Author: S. M. Morrissey
S.T.C. Capacitor Div., Brixham Road, Paignton, Devon, England
Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 170_8 words

Abstract: "DYNOD" is a simple ODT, limited to examination and changes to core locations in any field. It was written for an on-line interrupt driven system, for use without stopping the background job. It uses 1 page of core if external I/P and O/P routines are used, approx. 170 locns. if self contained.

Media Price Code: D2, F5, G6

CASINO: Sykes Cassette Input/Output **8-812**

Author: M. G. Fishel, R. Vyncke
Free University Brussels V.U.B., Brugman University Hospital, Brussels, Belgium
Submitted by: S. Orloff
Free University Brussels V.U.B., Brugman University Hospital, Brussels, Belgium
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Sykes 3000 series Cassette Unit

Abstract: Program CASINO saves core image files of up to 4K on cassettes or reloads saved files from cassette into core, avoiding slow and noisy paper tape handling. Program CASINO resides on one page in core and is fully relocatable. A bootstrap is provided. CASINO was written for a system with the following configuration: PDP8-E, VT05 and SYKES 3220.

Media Price Code: D2, F5, G8

DIGFIL: RECURSIVE DIGITAL FILTER **8-813**

Author: H. -W. Ridder, K. Meinke
Radiologiezentrum der Philipps-Universitat, 355 Marburg, Germany

Source Language: PAL-D
Memory Required: 4K
Other Software Required: 4K Disk Monitor System required for assembly

Abstract: This program is written for on or off-line digital filtering. It combines high accuracy by multiple precision computation with convenient decimal input of filter coefficients. The program may be extended by user written subroutines for data acquisition etc.

Media Price Code: D2, F5, G10

PROCES: An Image Processing Program for the PDP-8E **8-814**

Author: Peter Lemkin and Bruce Shapiro
Image Processing Unit, National Cancer Institute, National Institutes of Health, Bethesda, MD

Operating System: OS/8 V3
Source Language: FORTRAN II/SABR
Memory Required: 32K
Special Hardware Required: EAE required. (Line printer, scanner, display optional.)

Abstract: "PROCES" is a stand-alone PDP-8E program running on the Image Processing Unit's (IPU) "Real Time Picture Processor" (RTPP) which is used to process 256 × 256 raster scan picture files. It can display a 256 × 256 raster on a Dicomed Display with 64 levels of gray, print subpictures (up to 72 × 72) on a teletype or lineprinter, output a processed picture into a picture file, average it, take its laplacian or gradient, and perform picture operations (max, min, +, −, * , /) on two gray scale pictures. In addition, PROCES can find a boundary, mask an image with the boundary, generate a gray scale histogram display or printout, and find the maxima/minima of the gray scale histogram. The IPU uses digitized images of microscopic fields acquired via a galvanometer scanner, but any properly formatted Digital array may serve as "pictures."

Media Price Code: A3, H32
Format: OS/8

BINPUN: OS/8 Binary Punch from Core Image Files **8-815**

Author: Torben Poulsen
Technical University of Denmark, Lyngby, Denmark

Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: EAE and Paper Tape Punch

Abstract: BINPUN is used to generate a binary paper tape version of a save program (core image file), and thereby achieve a safety backup copy of the saved program. The binary output from BINPUN contains all necessary codes and can be loaded by means of the ABSLDR program. The saved program to be punched needs not be loaded in core prior to punching as BINPUN reads the codes directly from the core image file.

If needed BINPUN is able to merge multiple files into a single binary paper tape.

Media Price Code: D2, F5, G5

PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter **8-816**

Author: Shlomo Z. Ron
New York City Health and Hospital Corp. New York, NY

Operating System: OS/8
Source Language: SABR
Memory Required: 1 page for scope, 2 pages for plotter
Special Hardware Required: KV8E interface and storage scope, incremental plotter.
Other Software Required: OS/8 FORTRAN II

Abstract: This is a package of two independent FORTRAN II subroutines; one for plotting on Tektronix 611 storage scope and the other for plotting on an incremental CALCOMP 563 plotter. The calling format for the two subroutines is basically the same. The subroutines provide for pen up and pen down, best approximation to a straight line, coordinate plotting and plotting of x at desired locations.

Media Price Code: D2, G6

SYKBOOT **8-818**

Author: John Youngquist
Verus Instruments, Inc. Fort Erie, Ontario, Canada

Operating System: OS/8
Source Language: PAL-8
Memory used: 44_8 words
Special Hardware Required: High speed reader

Abstract: Sykboot is a novel bootstrap program for booting OS/8 from a Sykes Model 7150, 7250 Floppy Disk System. Sykboot loads a special tape from the High Speed Reader with an 8 location program that contains the standard 27 location Sykes Bootstrap. Once read in, the program self starts and OS/8 is booted. It saves toggling 19 tedious locations every time a re-boot is required.

Note: It requires a High Speed Reader and cannot be easily modified for ASR-33.

Media Price Code: D1

PAL 8 × 2 **8-819**

Author: B. Wharton
ITT Components Group Paignton, England

Operating System: OS/8 V3
Source Language: PAL-8
Memory Required: 12K

Abstract: This is a PAL-8 patch to include a /P switch. It allows the user of large source files to list only one page of the source file (in listing form) rather than the entire file. This modification does not allow PAL-8 to be used for creating binaries—only listing files.

Media Price Code: D1, G5

WIPE: TSS/8 User Directory Cleaner **8-820**

Author: John E. Comeau
District One Technical Institute Eau Claire, WI

Operating System: TSS/8 V8-22B
Source Language: PAL D

Abstract: This program is designed to clean the TSS/8 system of files created before a given date from the system manager's account. WIPE will delete all the files on the system according to their creation date, regardless of protection codes. Specified accounts may be optionally "protected" from deletion of any files.

Another option allows complete "System WIPE." This option allows the manager to rebuild (delete all accounts as in a refresh) the system, yet maintain special accounts. After execution, the master accounts and any protected accounts are intact, yet all the others are deleted.

Media Price Code: D2, F5, G8

SPASTIC IV **8-821**

Author: Robert M. France and Douglas B. Stefanelli
Southampton, PA

Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: SPASTIC IV is a programmable scientific calculator-type program designed to provide a powerful means for solving complex problems quickly, easily, and in a straightforward manner. SPASTIC IV has an extensive array of operations and functions ranging from simple arithmetic to statistical functions, trigonometry and logarithmic functions. Several sets of modes are also available to extend the capabilities.

Media Price Code: A2, F7, G48

CHEKMO II: Chess Playing Program **8-822**

Author: John E. Comeau
Digital Equipment Corporation Maynard, MA

Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 4K
Other Software Required: Requires OS/8 for assembly.

Abstract: CHEKMO II is a chess playing program which will run on any PDP-8 family computer. The program will play either the white pieces or the black pieces, and will play and accept all classes of legal moves, including castling both short and long, en passant pawn captures, and pawn promoting moves to any legal promotion piece. The program prints out its moves in Algebraic Notation, and accepts moves using Algebraic Notation.

Included in the command structure of the program are commands which allow you to input board positions using Forsyth Notation, and get a printout of the board at your terminal.

Media Price Code: A2, F6, H32, K27
Format: OS/8

DDTG: Real Time Picture Processor Monitor–Debugger **8-823**

Author: Peter Lemkin
National Institutes of Health Image Processing Unit Bethesda, MD

Operating System: OS/8 V3G
Source Language: FORTRAN II/SABR
Memory Required: 32K
Special Hardware Required: RK05 recommended

Abstract: DDTG, a monitor/debugger is constructed for user and/or computer control of the Real Time Picture Processor (RTPP). The latter, a multiprocessor image acquisition/analysis system functions under DDTG in either stand alone mode (direct user control) or is driven by one of several complex interpreter/model structures existing on a remote time shared PDP-10 computer. In the latter case, the overall system, i.e., DDTG running on the RTPP, and driven by PDP-10 structures, constitutes the CELMOD system. Documentation for RTPP can be requested from NTIS (National Technical Information Service) in Springfield, VA (NTIS #PB252268/AS).

Media Price Code: A9, H96
Format: OS/8

LABL: Legible Leader Handler for OS/8 **8-824**

Author: Jim van Zee
University of Washington Seattle, WA

Operating System: OS/8
Source Language: PAL-8
Memory Required: 2 pages

Abstract: This is a two-page handler for the OS/8 (or any other compatible) monitor system. It punches readable characters on a paper tape using either the high-speed or the low speed (teletype) punch. The handler waits at the beginning for the punch to be turned on and pauses again at the end for the low-speed punch to avoid spurious output on the tape. A 4 × 6 matrix representation is used for each symbol (upper case only) with spaces substituted for all non-printing characters.

Media Price Code: D2, F5, G6, H32, K27
Format: OS/8

ALPHA.SV: Sort OS/8 Directories **8-825**

Revised: 20 December 1977

Author: H. S. Hopkins, Jr.
General Latex and Chemical Corp. of Ohio

Operating System: OS/8
Source Language: PAL-8

Abstract: ALPHA is an OS/8 utility program to sort directories on any one of the four keys contained: filename, extension, creation date, or starting block number. ALPHA V03 is an extensive revision to the original DECUS 8-825 submission to update for the extended date of OS/8 V3D plus additional enhancement provided in the form of a heading print of the sort method, and printout of the DECSYSTEM-8 parameter block information. Operating systems provided for are PS/8, OS/8, OS/12, DECSYSTEM-8, and OS/78. Extensive checking of the parameter block information prevents 'runaway' garbage printing in case DECSYSTEM-8 parameter blocks are not being used. The new date format in OS/8 V3D is supported.

Note: ALPHA is also available on LINCtape. It is included with DECUS NO. 12-212 LTFRMT program.

Media Price Code: A2, H32
Format: OS/8

Program System to Analyze Analogue Signals with the LAB-8 System **8-826**

Author: Klaus Lickteig
Institut fur Kerntechnik, Technische Universitat Berlin Marshstrasse 18, 1000 Berlin 10, Germany

Operating System: OS/8 (Optional)
Source Language: PAL-8
Memory Required: 8K or 12K
Special Hardware Required: AX08 Lab Peripheral with scope, and EAE.

Abstract: This program system will perform a cross- or auto-correlation on analogue stochastical signals x(t) and y(t) in real time. With an 8k memory you can calculate auto-, cross-correlation-, power- and cross-spectral-density-functions. With a 12k memory you get additionally the imaginary and real parts of the spectral-densities; transfer- and coherence-functions; phase angle and Nyquist plot. An output off all functions is possible onto oscilloscope, analogue x – y plotter, teletype or high-speed-punch.

This program allows an automatic calculation of all the functions. During off-line calculation an analogue magnetic tape with the measurement signals will be controlled automatically.

Media Price Code: D5, F12

DDCMP: Half-Duplex Subset of Digital Data Communications Message Protocol **8-827**

Author: Jonathan R. Gross
Digital 8030 Cedar Avenue So. Minneapolis, MN
Operating System: RTS-8
Source Language: PAL-8
Memory used: 3200_8 words

Abstract: DDCMP is a half-duplex, point to point, dial up subset of D. E. C.'s Digital Data Communications Message Protocol implemented as an RTS8 task. DDCMP permits the synchronous communication of data messages between two computer systems.

Media Price Code: A2, B4, G18

OS/8 FORTRAN-IV Routines **8-828**

Author: Lars Palmer and Robert Phelps
Alistair Windran AA Hassle, Fack Sweden
Operating System: OS/8
Source Language: RALF and PAL-8
Other Software Required: OS/8 FORTRAN IV

Abstract: This tape contains in the first place several useful FORTRAN routines:

1. REGIST which is made up of several small routines.
   a) a routine to pass command decoder switches to a running FORTRAN program.
   b) a routine to perform IO to several laboratory devices and execute random IOT's from FORTRAN code.
2. FILSIZ which will allow a FORTRAN program to determine the size of a file given to the Run Time System.
3. BITS which will allow a program to store up to 36 logical variables in one FORTRAN variable.
4. ICHAR which will allow a program to fetch and send single characters to the console. This allows the FORTRAN program to do detailed control over all output characters.

The tape also contains the sources to all patches to the FORTRAN Run Time System published in the Newsletter and the /M patch to PASS3 mentioned in the Newsletter. It also contains other bits and pieces such as TECO macros which are of use in various situations.

Media Price Code: A2, H32, K27
Format: OS/8

Improved Mini Debugging Technique **8-829**

Author: Theodore E. Bridge
Springfield, MA
Operating System: Paper Tape
Source Language: Abbreviated PAL
Memory Required: 4K

Abstract: This program uses the BIN loader and the Punch overlay of DECUS 8-523 almost unchanged. The modify and octal dump overlays are much improved. Four other overlays are added. This debugging technique will now do almost everything that the DEC ODT will do; but it occupies only the last page of memory 7600-7777.

Media Price Code: D2, F5

CASTOR: Sykes *Cassette Editor* **8-830**

Author: M. G. Fishel, G. Vandermuellen, R. Vyncke, and S. Orloff
Free University, Brussels, V.U.B., Belgium
Source Language: PAL-III
Memory Required: 4K (0000-2673)
Special Hardware Required: Sykes 3000 series cassette
Other Software Required: Symbolic Editor

Abstract: Program CASTOR overlays Digital's symbolic Editor to enable reading and writing on a SYKES 3000 series cassette unit, it uses the ASR-33 or (and) the VT05. This results in considerable time savings when assembling PAL programs since PAL III has also been modified to accept symbolic source programs directly from the SYKES 3000 series cassette unit (PALLUX). The original FORM FEED (F), GET (G) and TRAILER (T) commands, the ESCAPE key and the high speed paper tape reader and punch routines are inoperative.

CASTOR was written for a system with the following configuration: PDP-8E, VT05, ASR-33 and SYKES 3220.

Media Price Code: A2, B2, F5, G16

BLKPIP: OS/8 Transfer Program for Files and Blocks **8-831**

Author: Karlheinz Siehold and Friedeman Brauer
HNO Forschungstrakt Klinikum Westend Spandauer Damm D-1000 Berlin (West) 19 Germany
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: BLKPIP is an OS/8 Transfer Program. Various OS/8 files and blocks can be chained, creating a new file or a set of contiguous blocks. The program replies with the command decoder "*" when called. Sets of blocks are specified by starting block number, followed by the octal number of blocks: NNNN, MMMM. If less than 100 (octal) blocks are required, the two digit octal number can be given as "extension": NNNN, MM. BLKPIP doesn't open files already existing. The program is useful for blockwise transfer of data, recovering files from "smashed" devices, etc.

Media Price Code: D2, F5, G8, K27
Format: OS/8

IPSLAV: Slave Program, and DB8E Interprocessor Buffer Handler **8-832**

Author: Karlheinz Siehold and Friedeman Brauer
HNO Forschungstrakt Klinikum Westend Spandauer Damm 130 D-1000 Berlin (West) 19 Germany
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: DB8E Interprocessor Buffer

Abstract: OS/8 slave program, and DB8E interprocessor buffer device handler (1-page) for the host computer. The program replies with the command decoder when called. The name of an OS/8 device belonging to the slave computer requested (where the DB8E device handler must have been implemented into the OS/8 system with "build"). CTRL/U selects another device; CTRL/C goes back to OS/8 monitor the program is restartable at 2000.

Media Price Code: D2, F5, G6

VT50 CURSOR MOVE **8-833**

Author: Jeffrey Shrager
Radnor High School, Newton Square, PA
Operating System: OS/8
Source Language: PAL-8
Other Software Required: OS/8 BASIC

Abstract: Direct BASIC cursor control of the VT50 line of CRT can entail a rather complex BASIC subroutine. CMOVE enables the programmer to pass the vertical and horizontal coordinates to a BASIC/8 user function which will move the cursor to that position and stop.

Media Price Code: D2

LIB8X: FORTRAN II EAE Library **8-834**
Author: Phillip D. Siemens/Allan L. Vanlehn
Lawrence Livermore Laboratory, Livermore, CA
Operating System: OS/8
Source Language: SABR
Special Hardware Required: PDP-8E Series EAE
Other Software Required: OS/8 FORTRAN II

Abstract: LIB8X is a FORTRAN II library which makes use of Mode A EAE instructions, and as a result, executes programs approximately twice as fast as standard OS/8 FORTRAN II. The format of the floating point word was changed to a 23 bit mantissa which causes a reduction in precision. However, the new routines have a reasonable rounding algorithm and by empirical tests maintain better accuracy in interative calculations than the 27 bit package. New subroutines EOF, on device 4; RESET, implements DECODE; LBYT & SBYT for byte manipulation.

Note: Old Data must be converted.

Media Price Code: A1, H32, K54
Format: OS/8

QUICKPOINT-8: Numerical Control System **8-837**
Submitted by: Dave Rogers
Digital Equipment Corp. Maynard, MA
Operating System: Paper Tape
Source Language: PAL-10
Memory Required: 4K

Abstract: The Quickpoint-8 System, an advanced concept in part programming for numerically controlled machine tools, is currently available and may already be installed in your shop. This Users' Guide presents the Quickpoint-8 System concept; the Quickpoint Language, operating procedures, and part program preparation information. Moreover, convenient tables, flow charts and instructions are included to aid personnel in training part programmers and provide easily accessible reference material for the experience part programmer.

Chapter 1, System Description, contains a description of the important features of the system and a brief summary of its functional operation.

Chapter 2, the Quickpoint-8 Language, is a dictionary of the command vocabulary recognized by the Quickpoint-8 System.

Chapter 3, Operating Procedures, contains flow charts that provide step-by-step instructions for operating the Quickpoint-8 System.

Chapter 4, Input Data Program Preparation, contains general instructions for language usage and applications in the preparation of the input data programs from which part programs are compiled.

Media Price Code: E10, H64
Format: DECsystem-10

PALLUX: Sykes Cassette PAL III Assembler **8-839**
Author: M. G. Fishel, G. Vandermeulen, S. Orloff and R. Vyncke
Free University, Brussels, V.U.B.
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Sykes 3000 series cassette
Other Software Required: PAL-III Assembler

Abstract: Program PALLUX overlays PAL III, Digital's Assembly Program, enabling PAL to read the symbolic program from the SYKES 3000 series cassette unit, in addition to paper tape, and to output the assembled program at the ASR-33 or VT05. (The symbolic program is written on to the SYKES 3000 series cassette unit by use of the program CASTOR). PALLUX also includes the formatting of pass 3 listings into page size blocks and the correction of a bug in the routines ETYPO (subroutine to type error code) and ERROUT (clears junk of the pushdown list).

The high speed paper tape reader and punch routines are inoperative.

Media Price Code: D2, F5, G10

COCAS: Sykes Copy Cassette **8-840**
Author: R. Vyncke, S. Orloff, M. G. Fishel and G. Vandermeulen
Free Univ. Brussels, Belgium
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Sykes 3000 series cassette

Abstract: Program COCAS enables the user to copy ASCII and BIN files from cassette onto cassette on the SYKES 3000 series cassette unit. ASCII files, generated by program CASTOR (to appear in DECUS), and BIN files, core image files of up to 6200_8 bytes saved by program CASINO (DECUS 8-812), may be copied on the same or another cassette. Besides a parity error check, COCAS includes a print out of all output file addresses at the VT05 or ASR-33.

Restrictions: High speed search option required with cassette unit

Media Price Code: D2, F5, G10

CHRFSB: FORTRAN II ASCII Character Subroutine (File name CHRFSB) **8-841**
Author: Michael E. Styles
Seaway District High School, Iroquis Ontario, Canada
Operating System: OS/8
Source Language: SABR
Other Software Required: OS/8 FORTRAN II

Abstract: This subroutine written in SABR assembler provides the OS/8 FORTRAN II user with a function that is very useful in the basic language. The program is designed to return ASCII characters which are predetermined from the arguements in the calling program. In calling the subroutine, the user provides an ASCII number which is used by the subroutine and the corresponding ASCII character is returned. The ASCII numbers generally run from 0-63. However, the user may input a number larger than 63 since the subroutine has a "MODULO 64" feature.

Media Price Code: D2

DIRECT: OS/8 Directory Listing Program **8-842**
Revised: 19 May 1977
Author: Jim VanZee
Submitted by: Robert Hassinger
Liberty Mutual Research Center, Hopkinton, MA
Operating System: OS/8
Source Language: PAL-8

Abstract: This is an improved version of the directory listing program distributed with OS/8 Versions 3/3C. It is functionally equivalent to the original version and includes updates which have been published up to the time of submission. To distinguish it from earlier versions it has been designated "V5". The loading and operation instructions in the OS/8 Handbook apply without change to this version.

Significant features of this program include the ability to print multiple column listings in column order rather than row order, and the ability to print alphabetized directory listings. The new OS/8 date format is supported.

Media Price Code: A1, F5, G10, H32, K27
Format: OS/8

SDBOOT: A Short Bootstrap for a non-OS/8 Sykes 7100 Floppy Disk System **8-843**
Author: P. M. Holtham and I. M. Templeton
National Research Council of Canada
Source Language: PAL-8
Memory used: 2 pages
Special Hardware Required: Sykes 7100 Floppy Disk

8-843 (Cont.)

Abstract: An extremely short (12_{10} instructions) toggled bootstrap for a Sykes 7100 disk system is presented. This bootstrap reads disk-resident code, prestored in a 6 + 6-bit format which overwrites the toggled code and then takes over. The resident code has room for up to 86_{10} user-written instructions which are used to load an appropriate disk handler. Also provided is the program needed to prestore this code in the required format on track 0 of the disk.

Media Price Code: D2, G5

FLIST: OS/8 FORTRAN IV: Listings without Recompiling **8-844**

Author: Daniel Beetham Smith
Eye Research Institute, Boston, MA
Operating System: OS/8
Source Language: PAL-8

Abstract: FLIST is a short program which interfaces with and chains to PASS 3 of the F4 system. Any program that is known to compile without errors may be listed with FLIST, producing output identical to that produced by a full compilation, including ISN'S.

If only a listing is needed, FLIST can save considerable time relative to recompiling on a floppy disk or DECtape system, and long programs can be listed even if the system device is nearly full.

Restrictions: Does not handle wild-card construction

Media Price Code: D2, G5

VIRCOP: OS/8 System Creation and File Copy Utility Programs **8-845**

Author: P. M. Holtham
National Research Council of Canada
Operating System: OS/8
Source Language: PAL-8/FORTRAN II
Memory Required: 16K variable

Abstract: Two programs are provided which enable users who possess only one disk drive, and no other mass storage device, to create new OS/8 system disks and to copy programs between disks. The programs were designed primarily for either 12 or 16-bit operation on a Sykes 7100 disk unit, but work successfully on a single DECtape system and may well be of interest to other single mass storage device users.

Media Price Code: D2, G10

VC8E-TV: HANDLER for a Storage Scope **8-847**

Author: Jim Van Zee
Department of Chemistry, University Washington, Seattle, WA
Operating System: OS/8
Source Language: PAL-8-V9 or later
Memory Required: 2 pages
Special Hardware Required: VC8E or VC8A Point Plot Display Controller and storage scope

Abstract: This is a two-page handler for the OS/8 operating system which generates and displays alphanumerics on a storage oscilloscope using a standard VC8E controller. Keyboard paging is used to erase the screen when it fills up, and optionally, to return to the monitor. Because of variations in the design of this interface, several versions of this handler have been developed:

A: Early design with XYZ outputs & non-standard erase
B: Later design using the enable register for erasing
C: Optional modification to A to permit CTRL/C checks
D: Optional modification to B to check for read calls

Media Price Code: D3, F7, G26, H32
Format: OS/8

LPTSPL: A Lineprinter Spooler for the OS/8 "PRINT" CUSP **8-848**

Author: Gerson Grosfeld and Peter F. Lemkin
National Institutes of Health, Bethesda, MD
Submitted by: Peter F. Lemkin
National Institutes of Health, Bethesda, MD
Operating System: OS/8 V3
Source Language: FORTRAN II/SABR
Special Hardware Required: Line printer

Abstract: "LPTSPL" lists up to 5 files specially formatted on a line-printer or other output device. The program is called through the CCL "PRINT" command using the Command Decoder. Formatted output contains, on each page, a page header consisting of input file name, date, and page number followed by the file text with consecutive line numbers. Several Command Decoder and text-imbedded switches are available for greater operating flexibility.

Media Price Code: A2, H32
Format: OS/8

MAG10: A PDP8/e File Based Magtape Utility **8-849**

Author: Peter Lemkin
National Institutes of Health Bethesda, MD
Operating System: OS/8
Source Language: FORTRAN II/SABR
Memory Required: 28K

Abstract: MAG10 is a PDP8e utility program which uses the command decoder to specify commands to manipulate and transfer files between the MTA0: or MTA1: and OS8 devices. The MAGtape files have associated file headers permitting access of particular files by name. Using the 9-track tape mode, it uses either the TC58 or TM8e MAGtape controllers for the TU20-10 drives. The TC58 may be used with an OS8 system which is "built" for the TM8e MAGtape devices. That is, MAG10 has its own MAGtape handler but uses the fact that MTA0: and MTA1: exist in OS8 to permit the names of the drives to be specified to the command decoder.

Note: TM8e not debugged yet

Media Price Code: A2, H32
Format: OS/8

USR And other Special Purpose Subroutines for OS/8 FORTRAN IV **8-850**

Author: Robert W. Phelps
University of Rochester Medical Center, Rochester, N.Y.
Operating System: OS/8
Source Language: RALF
Memory used: 1200_8 words

Abstract: Called from FORTRAN by the statement:

CALL USR (UNIT, NAME, FUNCT, ERROR)

Allows execution-time opening and closing of standard OS/8 files from FORTRAN IV. The calling sequence specifies the logical unit number, device-filename, and whether the file is to be read, written or closed. File or device errors are returned by a fourth parameter.

Up to five files may be independently opened, read/written, or closed. Large programs may use buffer space of unused logical unit numbers—USR only allows files to be opened for logical unit numbers for which there is enough core available.

A patch to FRTS is necessary (and described in the write-up) for USR to work properly.

Note: (*from the DECUS Librarian*: *The Library has received numerous favorable comments on this package*; *however, compatibility with the current release of OS/8 is uncertain.*)

Media Price Code: A2, H32, K54
Format: OS/8

FORTRAN II Library Subroutines **8-852**
Author: Michael E. Styles
Seaway District High School, Canada
Operating System: OS/8
Source Language: SABR
Memory Required: 2 pages
Other Software Required: OS/8 FORTRAN II

Abstract:

MODF–Integer a modulo b subroutine.

CHRF–ASCII character return subroutine

RSWF–Subroutine to return logical value of SWR switch

SIGNF–Integer sign return subroutine

PNTF–Extended version of CHRF; prints control characters.

Media Price Code: D3

LOG: Log and disk partition assignment program **8-854**
Author: Vernon Blackmore
Christie Hospital Withington Manchester M20 9BX England
Operating System: OS/8 V3
Source Language: PAL-8
Memory Required: 12K
Special Hardware Required: KV8E or KV8I Scope

Abstract: PART I: LOG has two main functions:
1. To record details on the use of the machine.
2. To allocate to each user a part of a mass storage device.

Large storage devices may be split up into smaller separate 'devices' which removes directory overflow problems and gives users their own individual disk space. The LOG system comprises three programs: LOG.PA–the source, MULT.PA–special handler and LOGANL.FT–analysis program for the log file created by LOG.
PART II: KBLD:
KBLD is a building program that converts OS/8 to use a KV8 display for the keyboard monitor, command decoder, teletype handler and ODT.

Media Price Code: A3, H32
Format: OS/8

CONVRT: 4K Disk Monitor to PS/8 File Conversion **8-856**
Submitted by: C. Conley
Digital Equipment Corp., Maynard, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: TC01/TC08 DECtape

Abstract: CONVRT is a utility program that was written to convert ASCII DECtape files from the old 4K Disk Monitor System to PS/8 (or OS/8) format. It is believed by the submitter that it may also be able to convert TSS/8 ASCII DECtape files. There is no documentation available for CONVRT. Only the source file is provided on OS/8 format DECtape; it is 49 blocks long. The source file has few, if any comments. Modifications may be required in order to assemble and convert with OS/8.

Restrictions: Source file only. The program may require modification for use on current versions of OS/8. No support is available.

No write-up available.

Media Price Code: H32
Format: OS/8

Semi-Automatic Braille Embosser **8-857**
Author: Daniel J. Daily
University of Arizona, Tucson, AZ
Operating System: OS/8
Source Language: PAL-8
Memory Required: 4K
Special Hardware Required: ASR33 Teletype, modified (see write-up)

Abstract: BRAILE is a PAL-8 program which embosses Grade II braille, from a paper tape of English text prepared by a braillist using a teletype modified in the manner described by Anderson and Rogers in the article entitled, "An Inexpensive Braille Terminal Device" in the June 1968 Communications of the ACM. The semi-automatic involves the following steps:
1. A braillist marks some special symbols in the text to be translated into braille;
2. A typist, who needs no special knowledge of braille creates a paper tape from the marked text directly or with the SYMBOLIC EDITOR program;
3. The teletype is modified in the manner described above;
4. BRAILE is run using the paper tape from step 2 as input.

Media Price Code: B4, E6, G26

Information Retrieval Programs **8-859**
Author: Sally Swedine
VA Hospital, Seattle, WA
Operating System: OS/8
Source Language: FORTRAN II and SABR
Memory Required: 12K

Abstract: TRTRV, URTRV, ITEMIZ, ITMCNT, VRTRV, PRTRV, ORTRV, and RTLIST form a family of information retrieval programs on a PDP-8/E under OS/8. Data is stored in ASCII files on the systems device and edited with EDIT or TECO. Numeric and textual information can be used. The programs provide for selecting complex subsets of a file and storing specified variables from each selected record on DECtape for statistical or other analysis in four forms: paired, unpaired, columnar by record, and by complete lines. Exhaustive counts, frequency distributions on user-defined ranges for specified variables with histograms and percentages, and columnar listing are also available.

Media Price Code: On Hold
Format: OS/8

Extensions To OS/8 BASIC **8-860**
Author: Benson Margulies
The Harverford School, Harverford, PA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Other Software Required: OS/8 BASIC

Abstract: Sixteen functions have been developed to extend OS/8 BASIC. Several of the functions depend on special hardware present at The Haverford School; however, most will support any OS/8 configuration.

I. Functions for any PDP-8:
   a. Key data in from keyboard on the fly.
   b. Get a random number in a specified range.
   c. Common storage across program chain.
   d. Variable programmable pause (requires crystal clock).
   e. Keep elapsed time during program execution (same as d.)
II. Support for an extra terminal connected to a KL8-J without calling handlers
III. Special Hardware:
   a. Calendar/clock support
   b. A to D converter
IV. Direct cursor addressing on VT-50, 51, 52.

Media Price Code: D4, K27
Format: OS/8

Mass Spectrometer Functions for OS/8 BASIC 8-861
Author: G. Brent Dalrymple and Nathaniel D. Sherrill
U.S. Geological Survey, Menlo Park, CA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: DK8EC Clock, M1703, M236 Modules, see write-up.
Other Software Required: OS/8 BASIC

Abstract: The system consists of five 23-bit data channels and an elapsed time counter user for control and data acquisition from a high-precision mass spectrometer. The system requires three PAL-8 user-defined functions (USER4.PA) that are supplied.

Media Price Code: D2, G5

COMPAF: Compare All Files Program 8-862
Author: David Spector
Digital Equipment Corporation, Maynard, MA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 16K

Abstract: COMPAF compares all OS/8 files having the same name on two separate file-structured devices. A report is printed which includes the names of any such files whose contents differ in one or more words. COMPAF is a dependable way to verify the correctness of file copying operations.

Restrictions: Does not list locations which do not match.

Media Price Code: H32, K27
Format: OS/8

TECO Overlay 8-863
Author: M. Boudinot
C.N.R.S.–L.P.N.3, Yvette, France
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: VC8/E Display

Abstract: This is an overlay which allows TECO to use the VC8/E for displaying part of the text buffer.

Media Price Code: D2, F5

SNOBOL 8.2 Compiler 8-864
Author: Fred Nowicki
Submitted by: William Nowicki
Northwestern University, Evanston, IL
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: SNOBOL-8.2 is a SNOBOL-3 compiler which runs in 8K under OS/8. SNOBOL is a powerful string processing language based on pattern matching. Major restrictions are the absence of functions and extended arithmetic operations. Extensions include access to PAL code within the SNOBOL program, and OS/8 file manipulation operations. An extensive user's manual is included in the documentation.

Media Price Code: A4, H32, K27
Format: OS/8

SNOBOL 8.2 Demonstration Programs 8-865
Author: William Nowicki and others
Northwestern University, Evanston, IL
Operating System: OS/8
Source Language: SNOBOL 8.2
Memory Required: 8K

Abstract: This is a collection of sample SNOBOL-8.2 programs. The package includes a SNOBOL listing program, working documentation extraction system, and a source library management system. A sample library is included which contains many commonly used PAL8 subroutines. SNOBOL-8.2 sources are included, but core image files can be used directly without using the SNOBOL-8.2 compiler.

Media Price Code: D3, H32, K27
Format: OS/8

OS/8 Handler for Tektronix 4406-1 Graphic Terminal As Console Device 8-866
Author: Ronald P. Larken
Rockefellow University, New York, NY
Operating System: OS/8
Source Language: PAL-8
Memory Required: 2 pages
Special Hardware Required: Tektronix 4006-1 Graphic Display Terminal

Abstract: GT.PA is an OS/8 handler for the Tektronix 4006-1 Graphic Display Terminal in alphanumeric mode. It allows the terminal to input and output as the console device (device codes 3 and 4), possibly replacing a teletype in this capacity. The standard OS/8 features are available, plus the added feature of stopping at the bottom of the screen during output, allowing the operator to hit any key in order to erase and refill the screen with the next section of the text.

Media Price Code: D2, F5, G10

Random Number Generator 8-867
Author: David Spector
Digital Equipment Corp., Maynard, MA
Source Language: PAL-III
Memory used: 37_8 words

Abstract: This stand alone subroutine generates a well-distributed sequence of pseudo-random words. It is very fast as it averages 13 (decimal) instruction executions per call.

Media Price Code: D1, G5

MLDV: Multiplication and Division Subroutines 8-868
Author: David Spector
Digital Equipment Corporation, Maynard, MA
Source Language: PAL-8
Memory Required: 40_8 words each

Abstract: These four subroutines do the following single-precision, unsigned operations:
1. Integer Multiplication
2. Fractional Multiplication
3. Integer Division (with Remainder)
4. Fractional Division

These are suitable for any PDP-8 family computer, including the VT-78. Full descriptive comments appear in the source.

Note: These routines are single precision unsigned.

Media Price Code: D2, G6

OS/8 Magtape Handler and Utility **8-869**
Author: P. M. Holtham
National Research Council of Canada, Ottawa, Ontario, K1A 0R6 Canada
Operating System: OS/8
Source Language: PAL-8
Memory Required: 200_8 words
Special Hardware Required: 7 track magtape

Abstract: An OS/8 handler for writing ASCII files or output onto 7-track tape is provided. Character unpacking and tape blocking are done within the handler. A further program for reading the tape into, for example, an IBM computer, is also given. Both programs have the capability of handling variable record length files.

Note: Type of magtape drive and control are not specified in the documentation.

Media Price Code: D2

Interrupt Bus Testing Program **8-870**
Author: William Nowicki
Northwestern University, Evanston, IL
Source Language: PAL-8
Memory Required: 7 pages

Abstract: The interrupt bus testing program is a very useful tool when debugging interrupt-driven systems. A major problem with such systems is that one malfunctioning device can interrupt constantly, making the program hang in the skip chain. Also, a device which is unknown to the program can spuriously cause an interrupt, crashing the system. This program allows the user to quickly identify if this is the problem, and if so, what device is faulty. The source is easily modifiable for special needs.

Media Price Code: A2, G12, H32
Format: OS/8

U, A Program To Type Out CCL Recollections **8-871**
Author: Daniel P. B. Smith
Eye Research Institute Boston, MA
Operating System: OS/8
Memory Required: 8K

Abstract: Although the CCL "RECOLLECTION" feature (OS/8 Handbook, P. 1-54) is convenient, it is sometimes annoying that the recollections are totally "INVISIBLE." For example, if a command such as ".UA" produces puzzling results, it may be because the user himself has forgotten exactly what he specified.
PROGRAM "U" Provides a convenient way of examining CCL's recollections. For example,

.R U A

will type out the remembered "UA" command, while

.R U

will type out all of CCL's recollections.

Media Price Code: D2, F5

Sykes 7100/7200 Programs to Read And Write DEC Format Diskettes **8-872**
Author: I. M. Templeton
National Research Council Of Canada
Operating System: OS/8
Source Language: PAL-8

Abstract: The Data on a DEC diskette is written in 3/4 filled, interleaved sectors. It appears to be impossible to unscramble these via an OS/8 handler within the timing restrictions of the unbuffered sykes system, so the present approach has been used. The 'read' program reads sectors sequentially, two tracks at a time, and deposits the data in the correct (interleaved) places in a 6400-word buffer (in field 3, but this can be changed). This buffer is then copied, via a standard OS/8 handler, to an alternate file-structured device. As written, the program uses the (already resident) system handler with the unit set to 2, and writes the copy on a blank diskette, but any appropriate variation of this may be used. The 'write' program does the opposite, first filling the buffer from the source device, and then copying that to the DEC diskette in such a way as to reproduce the correct interleaving while writing sequentially.

Media Price Code: D2, K27
Format: OS/8

RSTS Terminal Monitor On A PDP-8 **8-873**
Author: Andras Nagy,
Technical University Budapest, Hungary
Operating System: OS/8 and RSTS/E
Source Language: PAL-8 and TECO macros
Memory Required: 12K in the PDP8, and enough core for RSTS/E in the PDP-11

Abstract: This document describes a super-monitor running on a PDP-8 small computer connected with a PDP-11/40 or 45. Its goal is to synthesize the powers and versatilities of the RSTS and OS/8 operating systems.
Hardware requirements (to the PDP-8) are at least 12K of core, 64K of mass storage (as a disk or DECtape) and a TTY-like serial interface to the PDP-11 (connected to a DL-11 or a DH-11, etc.)

Note: DECtape includes both 8-873 and 8-874.

Media Price Code: D2, G10, H32
Format: OS/8

Serial Input/Output Handlers For Interprocessor Communications **8-874**
Author: Peter Hanak
Technical University Budapest, Hungary
Source Language: PAL-8

Abstract: Be sure the PDR: (version 1.1) and the PDP: (version 1.2) handlers are active in your OS/8 system, otherwise, activate them by using OS/8 BUILD.
Check whether RSTS/E is running on the connected PDP-11 computer, otherwise, the connection can not be established.
Transmission can be accomplished between any peripherals of the two computers. The only limiting factor is the timing of the PDR: Handler, only the PDP-8 OS/8 system can control the transmission procedure.
When reading a file from the PDP-11 computer the PDP-8 waits about 30 secs for the first character and about 8 secs for the other ones, when timing expires the handler interprets this as an 'end-of-file' condition. When writing to the PDP-11 there is no timing at all.

Media Price Code: D2, G22, H32 (Order DECUS 8-873DECtape)
Format: OS/8

CRS80: 8080 Cross-Assembler **8-875**
Author: James Bonalumi
Carroll College Waukesha, WI
Operating System: Paper Tape
Source Language: MACRO-8
Memory Required: 4K

Abstract: This program is capable of assembling 8080 programs on a PDP8/F type of computer. Features include: full intel instruction set as

8-875 (Cont.)

in Bugbook 3, easy data table generation, one or two byte symbols, for addresses or device codes, capacity for over 400 symbols, and it runs in 4K. Output is page formatted on the third pass producing a listing looking something like the PS/8 PAL assembler, and the symbol table may be printed or suppressed at each pass. There is also one page of reserved code for a user to patch in I/O for other devices, like many of the small impact printers currently available.

Binary tape is compatible with most 8080 loaders, such as the one in DBUG Monitor.

Media Price Code: A5, F6, G14

OS/8 System Device Handler For Sykes 7250 Floppy Disk **8-876**

Author: Friedemann Brauer
HNO Forschungstrakt, Germany
Operating System: OS/8
Source Language: PAL-8

Abstract: Disk capacity is fully used, packing two 12-bit core words into three 8-bit disk bytes (the buffered model allows transfer of an odd number of bytes).

IBM compatibility is lost, since storage starts from track zero.

Both the system and the non-system handler are 2-page handlers, with entries for 2 units.

The system handler's second page resides in field two; patches necessary for FRTS, BLOAD and BASIC.FF are given (by Ian M. Templeton).

With a special secondary bootstrap format a very short toggle-in bootstrap for the system handler will do.

In case of field zero "crashes", manual start at 27722 allows re-booting the whole system.

Media Price Code: D2, G8 (Includes F)

OS/8 Non-System Device Handler For Sykes 7250 Floppy Disk **8-877**

Author: Friedemann Brauer
HNO Forschungstrakt, Germany
Operating System: OS/8
Source Language: PAL-8

Abstract: Disk capacity is fully used, packing two 12-bit core words into three 8-bit disk bytes (the buffered model allows transfer of an odd number of bytes).

IBM compatibility is lost, since storage starts from track zero.

Both the system and the non-system handler are 2-page handlers, with entries for 2 units.

The system handler's second page resides in field two; patches necessary for FRTS, BLOAD and BASIC.FF are given (by Ian M. Templeton).

With a special secondary bootstrap format a very short toggle-in bootstrap for the system handler will do.

In case of field zero "crashes", manual start at 27722 allows re-booting the whole system.

Media Price Code: D2, G6 (Includes F)

VT-52 or VT-78 PATTERN GAME **8-878**

Author: David Spector
Digital Equipment Corporation
Operating System: OS/8 or OS/78
Source Language: PAL-8
Special Hardware Required: VT-52 Terminal

Abstract: This is an enhanced version of a popular TV pattern game. It permits the user to create a pattern of light on the screen and watch the computer repeat it so it seems to evolve before your eyes. Features include pattern editing keys and built-in instructional displays. Any PDP-8 family computer (uses only 8K memory) with a VT-52 (or VT-78) display terminal may be used. Works best when terminal is set to high speed (9600 baud). Operating instructions are displayed on the terminal.

No write-up available.

Media Price Code: F5, H32, K27
Format: OS/8

MTFOTP: TM8E Magnetic Tape Package **8-879**

Author: Robert W. Phelps
University of Rochester Medical Center, Rochester, NY
Operating System: OS/8
Source Language: PAL-8
Memory Required: 12K (16K with TM8EZ and TM8ESU)
Special Hardware Required: TM8E/TU10 9-track Magnetic Tape

Abstract: MTFOTP (*M*ag-*T*ape *F*ile-*O*riented-*T*ransfer-*P*rogram) is a modification of DEC's FOTP which treats magnetic tape as a special directory device while at the same time retaining other FOTP functions. It can thus be used as FOTP.SV with extended mag-tape functions. These include (1) directory I/O, (2) positioning, and (3) subfile directories for grouping files.

TM8EZ is a handler written for the TM8E controller equipped with 9-track TU-10 magnetic tape. Using the DEC supplied handler, it is impossible to read or write industry compatible 9-track tape from standard OS/8 buffers. TM8EZ and the extended handler TM8ESU decode OS/8 buffers and read/write in standard 9-track mode, 384 characters/record (variable length records optional) with one ASCII character per frame. TM8EZ is ideal for use with MTFOTP when data must be transferred to other magtape equipped computers.

Media Price Code: A2, H32
Format: OS/8

RUNOFF V.6 **8-880**

Author: Thomas W. McIntyre
Submitted by: Michael McIntyre
McIntyre Computing, Harvard, MA
Operating System: OS/8 or OS/12
Source Language: PAL-8
Memory Required: 8K

Abstract: RUNOFF is a program which runs under PS/8, OS/8, or DECSYSTEM-8 to facilitate the preparation of typed or printed manuscripts, such as memorandums, manuals, theses, etc. The user prepares his material on any terminal, and writes it onto a file using TECO, EDIT, SCROLL, or any other editor available to the user. The user includes not only textual material, but also case and formatting information. RUNOFF then takes the file and reproduces it onto the line printer, teletype or other file to produce a final copy or final file image. It performs the formatting and case shifting as directed, and will also perform line justification, page numbering and titling, etc. as desired.

The principal benefit of such a program is that files prepared for use with it may be edited and corrected easily. Small or large amounts of material may be added or deleted, and unchanged material need not be retyped. After a set of changes, the program may be operated to produce a new copy which is properly paged and formatted. Documentation may thus be updated as necessary without requiring extensive retyping.

Note: Documentation on Media.

Media Price Code: E5, F9, H32, K54
Format: OS/8

Section 2.2
BASIC8 ABSTRACTS

MATHEMATICS–SET 1 BASIC8-1

Submitted by: Digital Equipment Corporation

BASKT–Demonstrates exponential convergence.

BICYCL–Solves simple time-speed-distance problem.

BOOKS–Demonstrates method of improving upon brute force to solve simultaneous equations.

CONVRG–Converges on e and Π by three methods.

DRINKR–Solves simple drinking/blood pressure relationships.

GROUP–Demonstrates brute force vs. substitutional solution of simple equations.

PASCAL–Method of generating Pascal's triangle using random numbers.

PROGRS–Solves a number progression problem.

QUADRT–Solves for the roots of a quadratic equation.

ROOTS–Finds the roots of any function between −20 and 20.

SIMUL–Solves simultaneous equations by brute force.

TICKET–Introduces the concept of logical branching.

CRSCNT–Solves for the area of a crescent (not generalized).

LADDER–Solves the slipping ladder program by Pythagorean Theorem.

CAI-ADD–Demonstrates a Computer Assisted Instruction drill and practice routine.

DISTANCE–Calculates distance between points in three-dimensional space.

Media Price Code: D3

MATHEMATICS–SET 2 BASIC8-2

Submitted by: Polytechnic Institute of Brooklyn

CRVLEN–Computes the length of any curve (analytically defined).

CVAREA–Computes the area under any curve (analytically defined).

GCD–Finds the greatest common divisor of any set of numbers.

LIMSIN–Evaluates the limit of sin x/x as x approaches zero, in both radian and degree measure.

PI2–Computes the area of a circle using both inscribed and circumscribed regular polygons.

PRIFA–Finds prime factors.

QUADRT2–Describes the graph of a second degree equation, $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$.

RATIO–Solves for the unknown in a proportion.

ROOTS2–Finds the real roots of the quadratic equation $ax^2bx + c = 0$.

SETS–Finds the union and intersection of any two numerical sets.

SIMEQN–Finds solutions to sets of up to ten simultaneous equations.

SLOPE–Computes the tangent slope for any function.

SQRT–Finds the square root of counting numbers up to five decimal places.

STATAL–Calculates the arithmetic mean (average) of a set of numbers.

SURFAR–Computes the area of any surface of revolution.

VOLSOL–Finds the volume of solids of revolution.

ARITH–Multiplication involving one and two digit multipliers.

Media Price Code: D6

MATHEMATICS–SET 3 BASIC8-3

ROUNDOFF–F. McPhetres

Rounds off numbers to any number of places.

SETS-1–CAMP, First Course

Determines the intersection of two sets of numbers.

TUTOR-1–Walter Koetke

Drill and practice with time-speed-distance.

AREA-1–Computer Methods in Mathematics

Solves for the area under a curve by equation.

FLIP-1–Basic BASIC

Uses random number generator in BASIC to flip a coin.

EXPON–NREL/SDC

Solves for t*O*e exponent in general exponential equations.

CERESI–DYMAX

Computes and prints the sum of the first n terms of the following series:

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \cdots + (-1)^{k-1}\left(\frac{1}{K}\right) + \cdots.$$

GCD–Adapted from the FOCAL program written by Roger B. Kerchner, Carleton College

Applies the Euclidean algorithm to the problem of finding the greatest common divisor for M and N.

WALK1–Bill Walker

A generalized plotting routine which prints a graph of an expression given in terms of x.

GAUSS–Philip Sorgen

Uses the Gauss-Jordan Elimination Method to solve N linear equations in N unknowns simultaneously.

ABSVAL–DYMAX

A series of seven programs which compute and print the absolute value of X.

ME EPSILON YOU DELTA–Roger Kerchner

A game designed to help in understanding the limit concept.

SINPLOT–Dennis Lunder

BASIC8-3 (Cont.)

Plots and prints a graph of the sine for function from 0-360 degrees.

GOLDBACH–CAMP, First Course

Provides new ways to approach theorem proving using Goldbach's Conjecture.

LINEAR–Frederick Brink

Finds the point where linear systems in 2 or 3 variables intersect.

Media Price Code: D3

PLOTTING–SET 1 BASIC8-4

Submitted by: Digital Equipment Corporation

DIAMON–Plots on N by N diamond matrix.

PLOTFN–Plots any function.

SINEX–Plots a sine wave.

3DPLOT–Plots any three dimension functions.

Note: The following routines are for teletype compatible plotters.

TPLOTU–Utility support routine for TSP-212 plotter.

FPLOTU–Utility support routine for TSP-212 plotter.

TPLOT1–Plots a family of 10 sine curves.

TPLOT2–Plots random horizontal and vertical lines.

TPLOT3–Plots connected horizontal and vertical lines similar to Etch-A-Sketch.

TPLOT4–Plots random length, random direction lines. Looks like electron traces.

TPLOT5–Polygon designer. Plots any polygon given the external angle and number of sides.

TPLOT6–Spiral designer. Plots a spiral of any shape given the external angle.

TPLOT7–Bar chart and point to point graph.

TPLOT8–Plots characters 1 to 8 at random locations with size proportionate to their value.

TPLOT9–Plots "3-dimensional" exponential functions.

FPLT10–Plots any function.

Media Price Code: D3

PHYSICS–SET 1 BASIC8-6

Submitted by: Polytechnic Institute of Brooklyn

BFIELD–A plot routine illustrating the B field about one and two wire currents. (Electricity and Magnetism)

BOHR–Hydrogen line spectrum and energy level diagrams are displayed. (Atomic and Nuclear)

CALORI–Calorimetry experiment to determine the heat energy to be supplied (or removed) from each mass to obtain the equilibrium temperature. (Mechanical)

DECAY1–Radioactive decay is treated qualitatively in a game-type situation.

DECAY2–Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EFIELD–An extension of Coulomb's law. Finds the relative field strength at a distance from a line and plane of charge. (Electricity and Magnetism)

KINERV–Review of kinematics; presents questions concerning the movement of a ball in flight. (Mechanical)

LENSES–Solves lens problems. (Light and Waves)

MASSD–Calculates mass defect.

NEWTN2–A problematic situation requiring repeated application of Newton's second law. (Mechanics)

PHOTEL–Critical wavelength for photoelectric emission is to be determined in a simulated experiment. (Atomic and Nuclear)

PHOTON–How energy levels are determined from the emission of excited atoms. (Atomic and Nuclear)

PLANK–A photoelectric simulation. Students adjust the retarding potential to determine the wavelength of randomly selected electron emitting X-rays. (Atomic and Nuclear)

PRJTL–Coordinates and speeds are printed for a projectile fired at selected speeds and angles (frictionless). (Mechanical)

REFLCT–Least time principle of light is presented as a challenge involving a game analogy. (Light and Waves)

SLITS–A plot routine permitting further exploration of Young's Double Slit experiment. (Light and Waves)

SNELL–A plot routine to aid in visualizing Snell's law. (Light and Waves)

SPACE–Demonstrates the effects of changing velocity on orbital motion. (Mechanics)

VFIELD–Plots a picture of the relative potential strength in the region surrounding two charges. (Electricity and Magnetism)

VLOCTY–Demonstrates that average velocity (D/T) approaches a limiting value as T O. A graph of D vs. T is plotted for an acceleration of 1 meter/sec^2. (Mechanics)

WAVES–Plots a graph of a fixed and a variable wave, and the superposition of the waves. (Light and Waves)

Media Price Code: D10

PHYSICS–SET 2 BASIC8-7

KINEMA–Digital Equipment Corporation

Tests knowledge of kinematics.

PHOTOE–Huntington Computer Project

Demonstrates photo electric effect.

UELEC–J. Martin

Produces tables of electric potential.

NEWTON–Project SOLO

Problem using Newton's second law.

ACCELER–Calculates the time in seconds it takes a vehicle to accelerate from zero to sixty miles per hour given curb weight, brake horsepower at maximum torque, and rear axle ratio.

Media Price Code: D2

CHEMISTRY–SET 1 BASIC8-8

Submitted by: Polytechnic Institute of Brooklyn

ATWT–Calculates atomic weight from percent abundance of isotopes.

AVOGA–Calculates Avogadro's number.

BASIC8-8 (Cont.)

DECAY1–Radioactive decay is treated qualitatively in game-type situation.

DECAY2–Calculates half-life, mass and prints a table showing mass or number of particles of a radioactive sample.

EMPIR–Calculates empirical formulas.

EQUIL1 and EQUIL2–Calculates the effects of concentration changes in the equilibrium systems: $2HI\ H_2 + I_2$ and $PCl_5\ PCl_3 + Cl_2$.

KINET–Tabulates and graphs equilibrium concentration data.

MASSD–Calculates mass defect.

MOLAR–Calculates molarity from titration data.

PHPOH–Calculates pH, poH and percent dissociation.

PRCNT–Calculates percent composition.

STOICH–Solves mass/mass, mass/volume, and volume/volume problems.

Media Price Code: D5

CHEMISTRY–SET 2 BASIC8-9

GASVOL–NREL/SDC/DEC Calculates and plots gas volumes at various pressures.

Media Price Code: D1

BIOLOGY–SET 1 BASIC8-10

Submitted by: Polytechnic Institute of Brooklyn

EVOLU/SIMPLIFIED VERSION–Demonstrates evolutionary mutations of pepper moths.

EVOLU–Simulated experiment–The relationship between evolution and natural selection is accomplished by studying a population of mutant moths.

DROS–Game approach to determination of the genetic characteristics of Drosophila.

GAMGN–Review of gametogenesis using diagrams and questions.

MEMBR–Experiment simulation showing the active and passive transport of materials across a membrane.

NZYMC–Simulated experiment–Degree of enzyme reactivity varies as environmental conditions are changed.

NZYM2–Simulated experiment–Maximum enzyme reactivity is shown as being dependent upon an interaction of environmental conditions.

PHOSYN–Simulated experiment–Photosynthetic production of sugar varies as student varies light intensity or carbon dioxide concentration.

Media Price Code: D4

EARTH SCIENCE–SET 1 BASIC8-11

Submitted by: Polytechnic Institute of Brooklyn

CLIMAT–Practice in identifying climates and climatic patterns.

CLOUDS–Explores problems related to the formation of cumuliform clouds.

WATER1–A tutorial program which goes through the calculations of a water budget.

WATER2–Prints a complete water budget.

Media Price Code: D2

BUSINESS AND SOCIAL STUDIES–SET 1 BASIC8-12

POPULATION–Gruenberger and Jaffray

Examins population growth of the U.S. and Mexico.

BALANC–Polytechnic Institute of Brooklyn

Simulates the effects of the relationship between costs of production and revenues.

BANK–Polytechnic Institute of Brooklyn

Solves financial problems concerning installment buying, long term loans and savings accounts.

CIRFLW–Polytechnic Institute of Brooklyn

Simulates the effect of a change in consumption of the "Circular flow model of goods, services and money."

CONSMP–Polytechnic Institute of Brooklyn

A simulation of economic depression and equilibrium as effects of consumption.

STOCK–Polytechnic Institute of Brooklyn

Simulates the stock market.

PURCHS–Dennis Lunder

Projects the purchasing power of the American dollar from 1970 to 1980 based on a base figure of $1.00 value for the year 1959 and values from 1960 to 1969.

Media Price Code: D3

ADMINISTRATIVE–SET 1 BASIC8-13

Submitted by: Polytechnic Institute of Brooklyn

AVERG1–Averages grades, lists value of curve, and adjusts grades.

AVERG2–Sorts and averages grades.

FREQ–Prints a frequency distribution (bar graph) of grades.

GRADE–Prints a table of grades (in percentages), number of questions missed, and number of questions answered correctly.

ITEM1–Counts and prints number of times questions are missed.

ITEM2–Sums item analysis.

STAT–A statistical analysis of laboratory data. (For teachers' use)

STATAL–Calculates the arithmetic mean (average) of a set of numbers.

Media Price Code: D2

COMPUTER WORKSHOP BASIC8-14

Submitted by: Alvin Beal

Abstract: This workshop is intended to provide the teacher or administrator with a knowledge of creating a list of instructions (a program) for a computer to perform. It is a clear, concise, step-by step set of instructions which introduce the user to the computer and its functions.

Media Price Code: D2

LIB12–Mathematical and Graphing Routines **BASIC8-30**
Submitted by: Geoffrey Chase

Abstract: A series of twelve programs written on 8K–2 user Edu-20. Routines include:

UNFLOT–The user inputs, in octal form, three 12-bit (4-digit) numbers representing the high, middle and low words of the floating AC; the program returns with the equivalent decimal value.

PERFCT–A fast program for finding perfect numbers up to 12 digits of precision.

SORTS–Actually 3 programs: (1) TREES–a binary tree (heap) sort; (2) TOP1–a fast version of the "top" sort; (3) TOP2–slower, but it remembers the input order.

CALEND–Prints a calendar for the current year. User inputs year (1969 or later).

POLY–Brute force polynomial search and reduction; user information and control are maximized. If and when quadratic level is reached, both roots (real or imaginary or complex) are calculated and printed.

CUBIC–G. Ruth's general solution of the quartic is in DECUS NO. FOCAL8-263. This program handles only cubics and quadratics, but allows for possible upward expansion by the user.

FRCADD–Adds fractions as fractions, finding L.C.D. and reducing answers to lowest terms. Written primarily for Edu-20/25, since these allow direct fractional input.

REPTER–A string of up to 6 digits, specified as repeating (9.0 repeating means 9.0909090 ...) or terminating (9.0 terminating is just 9) is converted to a proper or improper fraction reduced to lowest terms.

SINCOS–Graphs sine & cosine curves, with some attention to speed in execution.

ELLHYP–Tangent ellipse/hyperbola, with asymptotes of the latter.

POINTS–A series of graphs, on increasingly larger scales, of the hyperbolic curves of addition and cancellation of radiation from 2 point sources.

HARMON–A series of curves successively approximating a sawtooth or a square wave (user choice).

Media Price Code: D4, G16

Mathematics–Set 5 **BASIC8-31**
Submitted by: Walter Koetke

STNDEV–Calculates the mean, biased and unbiased variance, biased and unbiased standard deviation and standard error for one set of numbers.

PRIME–Determines if number N is a prime number.

TABLE–Table of values of sine and cosine function from 0 to 90.

PERMS–Prints all permutations of N letters.

DIVIDE–A simple exercise in division.

DERIV–Figures an approximation to the derivative.

CONTOURS–Demonstrates the level curves (contours) of a function of two variables.

MAX–Finds the maximum value of a function of an interval.

CHINES–Solves N simultaneous congruences of the form: A*X congruent to B (MOD M).

EUCLID–Finds the greatest common divisor of two integers, together with the weighting factors by which the GCD is expressionable as a linear combination.

SIEVE–Demonstrates the sieve method of finding primes.

FRSQRS–Writes positive integers as the sum of 4 squares.

INSCRB–Prints first ten Pythagorian triangles and the radius of the inscribed circle of each.

FACTAP–Computes factorials by Stirling's formula.

EASY02–Lists factors for given number N.

FACTRL–Computes the sum of the first N factorials.

SPHERE–Relationship of surface area, radius and volume of spheres.

Media Price Code: D2

Mathematics–Set 6 **BASIC8-32**

QTABLE–Produces a table of values for all algebraic and many rational functions.

CORREL–Calculates coefficient of linear correlation based on pairs of data supplied by the user.

INTEGR–Approximates a definite integral by using a Riemann sum for a user supplied function.

QUADEQ–Will solve any quadratic equations in the form: $ax^2 + bx + C = 0$.

SIGDIG–Raises any integer to any other integer and prints all significant digits.

EQUA–Shows the step-by-step solution to an equation of the form $AX + B = CX + D$.

SIMEQ2–Solves any system of two linear equations in two unknowns.

SIMEQ3–Solves any system of three linear equations in three unknowns.

Media Price Code: D2

SEQ; SAME; STAT1 **BASIC8-33**

SEQ–Gives alphabetic sequence and asks for next letter.

SAME–Exercise in which student finds synonym for given word.

STAT1–Accepts a minimum of 100 data values and will calculate minimum and maximum values, range, arithmetic mean, median, sample and population standard deviations.

Media Price Code: D2

Football Scouting Report Systems **BASIC8-34**
Submitted by: Harold L. Singer
Operating System: EDUsystem-30
Source Language: BASIC

Abstract: Two systems for analyzing football scouting information are described. Results of each play are coded on special mark sense cards and the game is exhaustively analyzed by a series of chained EDU-30 BASIC language programs. Actual use by our coaching staff has produced a time savings of from 18 to 30 coaching man hours per week.

Those not having a CM-8E mark sense card reader but equipment capable of running EDU-30 BASIC or OMSI-BASIC can easily code the play information on paper tape using the TTY.

Either of the two described systems can be used unchanged if your coaches can adapt to the notation system used. If they cannot, these systems should prove excellent guides for producing a tailor made system to your coach's specifications.

Note: CM-8E mark sense card reader recommended.

Media Price Code: D5, G30

XYPLOT; 3DGRAPH; PLOT-1 BASIC8-35

XYPLOT–Will plot single-valued functions of X, with X on the vertical axis.

3DGRAPH–Graphs functions of 2 variables. Each graph will be plotted 3 times.

PLOT-I–Plots integral values on a teletype terminal. No listing.

Media Price Code: D2, G5

LODICE BASIC8-36

Submitted by: David Martin

Abstract: Simulates rolls of one fair die and one loaded die. Students are to determine, by chi-square analysis, which is which.

Media Price Code: D1

Business and Social Studies–Set 3 BASIC8-37

AMOR–Computes monthly interest on a loan, given term and interest rates.

PAYRL–Computes and prints the payroll for a small company.

CPI–An economics project to calculate the CPI of a given year.

SALES–Computes and prints the weekly sales for each salesman.

BANKER–Tests student's understanding of different methods of compounding interest.

Media Price Code: D2

USAGE BASIC8-38

Submitted by: Dave Liebschen
Operating System: EDUsystem-25
Source Language: BASIC

Abstract: Tabulates usage of the computer system.

Media Price Code: D1

LILAC: Laband's Ingeneous Little Automatic Computer BASIC8-39

Submitted by: Keith Leband
Operating System: EDUsystem-25
Source Language: BASIC

Abstract: LILAC is a hypothetical machine language written in Edusystem-30 BASIC for a PDP-8 series computer. The program itself is supposed to simulate a real computer's machine language. It contains quite a few instructions that can be found in real assembly languages, but modified in form to fit the needs of this simulator. It also has a few other instructions not found in assembly languages.

Due to the size of the actual program, (on a 4K PDP-8) you are limited to only 175 lines of machine language programming. If you are using a larger BASIC, you can easily modify the program for more programming text.

Since this program simulates many of the steps in learning a real computer's machine language (i.e. the loading and operation of programs) it should be extremely useful to a beginner in machine language programming.

Media Price Code: D2, G5

Tutorial Exercises in Chemistry BASIC8-40

Submitted by: Paul Couchon

Abstract: Teacher's Guide and Student Workbook are available from DEC's Software Distribution Center.

I. METEST–Practice in the metric system units for measuring length, mass and volume. Consists of a sequence of multiple choice conversion problems that utilize the units most frequently encountered in science courses.

II. DENSITY–This exercise deals with the concept of density. Five different problems are presented, involving the relationships between the fundamental physical qualities of mass, volume and density. Each problem requires some application of the formula:

$$\text{DENSITY} = \frac{\text{MASS}}{\text{VOLUME}}$$

III. ELECTRONS–Drill in identifying the number of electrons having principal quantum numbers 1, 2, 3, or 4 in elements with atomic numbers from 1–22.

IV. ATOM–Problems giving the atomic number of an element which lies between LITHIUM and TITANIUM on the periodic table. Student required to describe structure of this atom regarding the number protons, neutrons and electrons in various s and p orbitals.

V. PERIOD–Exercise giving the student practice in using the periodic table and applying the Periodic Law. Questions require an understanding of the relationships which exist between elements and their position in the periodic table.

VI. COMPOS–Quantitative relationships between the elements that compose simple binary compounds. Compound selected at random from 42 possible combinations of six anions and seven cations. Questions asked concerning percent composition and relative number of grams and moles.

VII. EQUATI–Quantitative relationships in chemical reactions, stoichiometry. Students are provided with six balanced equations and must answer a sequence of questions concerning quantitative relationships between substances in three of the reactions.

VIII. RAOULT–Practice in solving problems which deal with the concentration of a solution and its freezing point, and the determination of molecular weight.

IX. MOLAR–Relationship between the moles and grams of a solute and the volume and molarity of the solution.

X. GASLAW–Relationships between temperature, pressure and volume of ideal gases. Practice in applying Boyle's Law, Charlie's Law and the Combined Gas Law.

Media Price Code: D4, G38

OMSI30 BASIC BASIC8-41

Submitted by: Barry Smith
Operating System: OS/8
Source Language: PAL-8

Abstract: A version of DEC's EDUsystem-30 BASIC (including all features) operating under the PS/8 and OS/8 systems. The system uses 8K instead of 4K–offering significantly larger programs and more variables. Compilation speed is also greatly increased.

Media Price Code: A1, B22, F24, H32
Format: OS/8

RECOVE: BASIC RECOVERY FROM CRASH BASIC8-42

Submitted by: James Puccio

Abstract: This program will allow the TSS/8 BASIC programmer to recover from system crashes and user-induced halts of BASIC. If the user is on a system that has two versions of BASIC, one simple BASIC and one extended BASIC, the program also allows selection of which processor to link to.

Media Price Code: D2, G5

NEOPAL: PAL-D SIMULATOR BASIC8-43

Submitted by: Christopher A. Kryzan

Abstract: NEOPAL was designed to provide students with a means of working in assembly language while still in BASIC. This also facilitates BATCH running of programs in assembly language assigned by the teacher. Output is in three passes: the first being a listing of the program as read in (in the form of data); the second being the actual execution of the program; and the third being a listing of the program after execution, (or core dump, if you will) as well as the status of the link and accumulator. Numbers are in base ten form, with 2048 equal to −2048, and 4095 equal to −1, etc.

Media Price Code: D2, G5

MATHEMATICS, SET 7 BASIC8-44

TUTOR–A drill and practice program designed to develop a student's skills in mathematical processes. Allows a specific area to be chosen, gives number of correct answers and percentage score. Runs under TSS/8 BASIC.

SIMEQ3–Solves N simultaneous equations using the addition method.

PYTH–Generates sets of whole Pythagorean triples. It neither repeats nor prints multiples.

Media Price Code: D2, G8

LIB9: Extended Precision Routines for BASIC BASIC8-45

Submitted by: G. Chase

Abstract: TAPE "A"

1. "LARG2", add or multiply 2 extended-precision integers. A subset of H.-P.'s "L(A)RGNUM" program.
2. "COLUMN," adds an arbitrary number (up to about 999) of extended-precision integers all at once, in a column, so to speak.
3. "EXSUB," subtracts one extended-precision integer from another. Handles negative answers correctly.
4. "EXDIV," swipes an algorithm from Knuth (V. 2) to allow division of an extended-precision dividend by an extended-precision divisor. Both quotient and remainder are printed in full precision (all digits).

TAPE "B"

5. "FACFAC," from Knuth (V. 1) is a remarkably simple program which lists the prime factors and their multiplicity (power) for the factorial of any single-precision integer typed by the user. In addition, a modified Stirling approximation is given of NAT. LOG (N!), COMMON LOG (N!), and of N!. Values of N! over 10 ↑ 38 cause no overflow.
6. "DEC10," extended-precision decimal integer converted to its extended precision octal equivalent.
7. "DECFO," single precision A/B fraction *OR* extended-precision 0.12345 ... String converted into extended-precision octal string.
8. "OCIDEC," the inverse of #6: octal integer to decimal. Extended precision, input and output.
9. "OCFDEC," the inverse of #7: octal fraction or octal string (0.12345 ...) converted to decimal string. Extended precision.

WARNING: #7–especially–and #9 in A/B input mode are quite capable of generating infinite answers.

Media Price Code: D3, G14

HORSE: TSS/8 HORSERACING PROGRAM BASIC8-46

Submitted by: Ed Vogel
Operating Sytem: TSS/8

Abstract: This horse race program includes betting, odds, and names for the horses. Its format is different than most other horse racing programs. Written in EDUsystem 50 BASIC, can be translated to other BASICS. Size is 5 TSS/8 disk segments.

Media Price Code: D1, G5

FILE: Text Data File Program for TSS/8 BASIC-4 BASIC8-47

Submitted by: David Dodell
Operating Sytem: TSS/8

Abstract: This program creates a BASIC data file and allows the changing, inserting, and addition of numeric and alpha strings of data. A printout then can be made at either the beginning or end of the program.

Limitations: Will work only with TSS/8 BASIC that has disk and an optional DECtape. BASIC has to be of the type that has data file capabilities.

Size: 4 TSS/8 Disk Segments

Media Price Code: D2, G5

STF and STM: Stellar Formation and Stellar Model BASIC8-48

Submitted by: Robert Schaffer

Abstract: Two BASIC programs are provided which can be applied to studies of stellar evolution and nuclear physics. STF is used to simulate the birth of any star, given certain parameters. At the same time, it tests the possibility of stellar contraction and the start of fusion. If fusion becomes possible, STF considers the condensation a star, and it halts. If condensation proves impossible, then no simulation of birth is given–STF halts. The second program, STM, is composed of several sub-programs which represent data concerning a given star. These sub-programs make it possible to compute a sun-relative model for any star, plot an H-R Diagram, plot the Mass to Luminosity ratio, or estimate the radius of a star.

These programs are more applicable to CAI than actual scientific studies, due to a simplified view of the processes involved.

Media Price Code: D4

GASSER BASIC8-49

Submitted by: Kent Springer
Operating Sytem: EDU-20/25
Source Language: BASIC

Abstract: This program solves problems involving the Ideal Gas Law equation for any of the four variables in the equation. It will accept temperature in degrees Farenheit, Centigrade, or Kelvin, pressure in P.S.I., atmospheres, or mm of mercury, and volume in liters or milliliters.

Media Price Code: D1, G5

CSHHS BASIC-73 BASIC8-50

Submitted by: "PK" Kretzman, George Roukis

Abstract: CSHHS BASIC-73 is a language patterned after, and in fact, consisting of numerous modifications to DECUS No. 8-195, POLY BASIC. Extensive rebuilding of both the compiler and editing sections

BASIC8-50 (Cont.)

have given the language enormous scope and increased power. Nevertheless, almost complete upward compatability has been maintained between POLY BASIC and CSHHS BASIC-73. Features include:

1) Computed GO TO, 2) Extended function definitions, 3) Data repointer, 4) Line search feature, 5) 'Tab' function, 6) Improved text handling, 7) Correction of all known POLY BASIC bugs, and many others.

Note: No source available.

Media Price Code: A2, F20

DISEDU: Loading EDUsystem-20 on the 4K Disk Monitor System **BASIC8-51**

Submitted by: Jeff Nisler
Operating System: 4K Disk Monitor System
Source Language: PAL-III

Abstract: This program enables the user to load and save EDUsystem 20 on the 4K disk/DECtape monitor system.

Media Price Code: D1, G5 (Includes F)

POSTER, SIGNS **BASIC8-52**

Submitted by: Christopher A. Kryzan, Malcolm Slaney

1. POSTER enables the user to produce posters with enlarged characters or figures inputted by the user. POSTER is actually a modified version of Christopher Kryzan's APPLE and is alike APPLY in every way, except that the user is able to design his own characters. This allows for more versatility in character production than APPLE. Messages up to 50 characters may be used (more on larger systems).
2. SIGNS prints signs on a standard 72 space wide teletype. It will print signs anywhere from ten characters to 72 characters wide. It will also start the sign where desired or will automatically self-center according to input. Another major feature is that you can specify whether it is to print black letters on a plain background or a white character on a black background.

Media Price Code: D2, G9

ACEDUC, TICTACTOE, CHECK6C, ONEARM **BASIC8-53**

Submitted by: Edward J. Quigley
Operating System: EDU-20

1. ACEDUC2, written in, and run under, a three-user configuration Edusystem-20, allows up to six people to play the game of Aceyducey at the same time, with the computer keeping track of each player's money, wins, losses, etc. The computer will also tell the player the odds he faces before he places his wagers.

This program also offers a good example of printout control.

2. TICTACTOE plays against a human opponent. The progam is intentionally beatable. Playing a program that cannot be beaten is very boring. It is not easy to beat the machine, but it *can* be beaten.

This game runs on a PDP-8/L running a standad Edusystem-20, with a three-user configuration.

3. CHECK6C plays a fair game of checkers against a human opponent. The program will play at the level of a very good amateur. It is usually beaten by a quality opponent, but fares very well against novices and other programs. Full directions are included in the write-up.

CHECK6C runs on an 8K PDP-8/L running Edusystem-20 with a three-user configuration.

4. ONEARM, written in Edusystem-20 BASIC, simulates playing a slot machine. The program allows variable payoff odds, six different fruits (double payoff if you get three boysenberries), and allows the player to carry his winnings or loses from one game to the next, should he care to. The bank breaks at 1000 dollars, and the player is broken at 1000 dollars lost.

The program will run on an 8K PDP-8/L with a three-user configuration.

Media Price Code: D2, G8

NLYSIS, POSTER2, CLNDR5, PIDART **BASIC8-54**

Submitted by: Edward J. Quigley
Operating System: EDU-20

1. NLYSIS is a program that 'analyzes' handwriting. The signature is put on any data input form (card/paper tape) and the program then goes to work on it.

NLYSIS HAS NO BASIS IN ACTUAL HANDWRITING ANALYSIS.

The program is a good example of how the computer's reputation as a "superbrain" can be used to fool the uninitiated.

2. POSTER2 prints out messages in large block letters, 5 lines by 5 spaces, in several rows, each row printed across the page, rather than down the length of the page.
3. CLNDR5 will print out, in 2 columns down the page, a calender for any given year from 1800 to 2300 A.D.

CLNDR5, with no changes, will run on an 8K Edusystem-20 with three users. When abbreviated (through the use of three-letter commands) the program will run on a four user system.

4. PIDART utilizes the random number generator to approximate pi.

Media Price Code: D2, G5

BASIC COMPUTER GAMES **BASIC8-55**

Author: David Ahl.
Revised by: Kay Fisher,
Digital Equipment Corporation, Maynard, MA

Abstract: The original games, compiled by David Ahl for RSTS-11 BASIC-PLUS, have been revised to run under OS/8 BASIC. A complete description of the games, listed as DECUS BASIC8-55.1 through BASIC8-55.108, is available as a book entitled "101 BASIC Computer Games" and can be ordered through the Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts 01754.

These games are available as a complete package on Papertape, DECtape, or Floppy Diskette (order BASIC8-55); or they may be purchased individually on Paper Tape (see the following list.)

Media Price Code: A1, G380, H64, K108

ACEY DU **BASIC8-55.1**
Media Price Code: G5

AMAZIN **BASIC8-55.2**
Memory Required: 12K
Media Price Code: G5

ANIMAL **BASIC8-55.3**
Memory Required: 12K
Media Price Code: G5

AWARI **BASIC8-55.4**
Media Price Code: G5

BAGLES BASIC8-55.5
Media Price Code: G5

BANNER BASIC8-55.6
Media Price Code: G6

BASBAL BASIC8-55.7
Memory Required: 12K
Media Price Code: G7

BASKET BASIC8-55.8
Media Price Code: G5

BATNUM BASIC8-55.9
Media Price Code: G5

BATTLE BASIC8-55.10
Media Price Code: G5

BINGO BASIC8-55.11
Media Price Code: G5

BLKJAC BASIC8-55.12
Memory Required: 12K
Media Price Code: G8

BOAT BASIC8-55.14
Media Price Code: G5

BOMBER BASIC8-55.15
Media Price Code: G5

BOUNCE BASIC8-55.16
Media Price Code: G5

BOWL BASIC8-55.17
Media Price Code: G5

BOXING BASIC8-55.18
Media Price Code: G5

BUG BASIC8-55.19
Media Price Code: G7

BULCOW BASIC8-55.20
Media Price Code: G5

BULEYE BASIC8-55.21
Media Price Code: G5

BULL BASIC8-55.22
Media Price Code: G6

BUNNY BASIC8-55.23
Media Price Code: G5

BUZZWD BASIC8-55.24
Media Price Code: G5

CALNDR BASIC8-55.25
Media Price Code: G5

CAN-AM BASIC8-55.26
Memory Required: 12K
Media Price Code: G10

CHANGE BASIC8-55.27
Media Price Code: G5

CHECKR BASIC8-55.28
Media Price Code: G5

CHEMST BASIC8-55.29
Media Price Code: G5

CHIEF BASIC8-55.30
Media Price Code: G5

CHOMP BASIC8-55.31
Media Price Code: G5

CIVILW BASIC8-55.32
Memory Required: 12K
Media Price Code: G8

CRAPS BASIC8-55.33
Media Price Code: G5

CUBE BASIC8-55.34
Media Price Code: G5

DIAMND BASIC8-55.35
Media Price Code: G5

DICE BASIC8-55.36
Media Price Code: G5

DIGITS BASIC8-55.37
Media Price Code: G5

DOGS BASIC8-55.38
Media Price Code: G8

EVEN BASIC8-55.39
Media Price Code: G5

FIPFOP BASIC8-55.41
Media Price Code: G5

FOOTBL BASIC8-55.42
Memory Required: 12K
Media Price Code: G8

FOTBAL BASIC8-55.43
Memory Required: 12K
Media Price Code: G8

FURS BASIC8-55.44
Memory Required: 12K
Media Price Code: G10

GOLF BASIC8-55.45
Memory Required: 12K
Media Price Code: G10

GOMOKO BASIC8-55.46
Media Price Code: G5

GUESS BASIC8-55.47
Media Price Code: G5

GUNNER BASIC8-55.48
Media Price Code: G5

HANG BASIC8-55.50
Media Price Code: G5

HELLO **BASIC8-55.51**
Media Price Code: G5

HEX **BASIC8-55.52**
Memory Required: 12K
Media Price Code: G5

HI-LO **BASIC8-55.53**
Media Price Code: G5

HI-Q **BASIC8-55.54**
Media Price Code: G5

HMRABI **BASIC8-55.55**
Media Price Code: G5

HOCKEY **BASIC8-55.56**
Media Price Code: G5

HORSES **BASIC8-55.57**
Media Price Code: G5

HURKLE **BASIC8-55.58**
Media Price Code: G5

KINEMA **BASIC8-55.59**
Media Price Code: G5

KING **BASIC8-55.60**
Memory Required: 12K
Media Price Code: G10

LETTER **BASIC8-55.61**
Media Price Code: G5

LIFE **BASIC8-55.62**
Memory Required: 12K
Media Price Code: G5

LIFE-2 **BASIC8-55.63**
Memory Required: 12K
Media Price Code: G5

LITQZ **BASIC8-55.64**
Media Price Code: G5

MATHDI **BASIC8-55.65**
Media Price Code: G5

MNOPLY **BASIC8-55.66**
Memory Required: 12K
Media Price Code: G10

MUGWMP **BASIC8-55.67**
Media Price Code: G5

NICOMA **BASIC8-55.68**
Media Price Code: G5

NIM **BASIC8-55.69**
Media Price Code: G5

NUMBER **BASIC8-55.70**
Media Price Code: G14

1 CHECK **BASIC8-55.71**
Media Price Code: G5

ORBIT **BASIC8-55.72**
Media Price Code: G5

PIZZA **BASIC8-55.73**
Media Price Code: G5

POETRY **BASIC8-55.74**
Media Price Code: G5

POET **BASIC8-55.75**
Media Price Code: G5

POKER **BASIC8-55.76**
Memory Required: 12K
Media Price Code: G8

QUBIC **BASIC8-55.77**
Memory Required: 12K
Media Price Code: G8

QUEEN **BASIC8-55.78**
Media Price Code: G5

REVRSE **BASIC8-55.79**
Media Price Code: G5

ROCKET **BASIC8-55.80**
Memory Required: 12K
Media Price Code: G5

ROULET **BASIC8-55.84**
Media Price Code: G8

RUSROU **BASIC8-55.85**
Media Price Code: G5

SALVO **BASIC8-55.86**
Memory Required: 12K
Media Price Code: G8

SLOTS **BASIC8-55.88**
Media Price Code: G5

SNOOPY **BASIC8-55.89**
Media Price Code: G5

SPACWR **BASIC8-55.90**
Memory Required: 12K
Media Price Code: G16

SPLAT **BASIC8-55.91**
Media Price Code: G5

STARS **BASIC8-55.92**
Media Price Code: G5

STOCK **BASIC8-55.93**
Media Price Code: G8

SYNONM **BASIC8-55.94**
Media Price Code: G5

TARGET **BASIC8-55.95**
Media Price Code: G5

3DPLOT **BASIC8-55.96**
Media Price Code: G5

TICTAC **BASIC8-55.97**
Media Price Code: G5

TOWER **BASIC8-55.98**
Media Price Code: G5

TRAIN **BASIC8-55.99**
Media Price Code: G5

TRAP **BASIC8-55.100**
Media Price Code: G5

23MTCH **BASIC8-55.101**
Media Price Code: G5

UGLY **BASIC8-55.102**
Media Price Code: G5

WAR **BASIC8-55.103**
Media Price Code: G5

WEKDAY **BASIC8-55.105**
Media Price Code: G5

WORD **BASIC8-55.106**
Media Price Code: G5

YAHTZE **BASIC8-55.107**
Memory Required: 12K
Media Price Code: G14

ZOOP **BASIC8-55.108**
Media Price Code: G5

Laboratory and Display Instructions for OS/8 BASIC **BASIC8-56**
Submitted by: Ronald Jones, Ph.D.
Operating System: OS/8
Source Language: PAL-8

Abstract: This program is a set of user-defined functions for OS/8 BASIC. It is combined with the LAB/8E functions (DEC-8E-ALOSA-A-LA) to build the file BASIC.UF; a run-time overlay for OS/8 BASIC. These functions control DEC analog and Digital input and output devices and the VC8E display-control. They permit real-time data sampling, with background display, and control of both the X and Y coordinates for CRT plotting.

Media Price Code: A2, B3, H32
Format: OS/8

RESEQUENCE (A revision of DECUS8-402) **BASIC8-58**
Author: Howard Wolfington
Revised by: Timothy M. Sigmon
Operating System: TSS/8
Source Language: PAL-D

Abstract: This is a revision of DECUS 8-402 which resequences line numbers and references within a BASIC program on TSS/8. It has been revised to handle the following TSS/8 extended BASIC options: 'OPEN-ELSE,' 'ON-GOTO,' 'PUT,' and 'GET' statements and the backslash option.

Media Price Code: D2, G22

STORM3 **BASIC8-59**
Submitted by: Bradford A. Morse

Abstract: This is a program written in BASIC on Edusystem-20, to simulate formations of clouds, rain storms, and the breakup of the clouds after the rain. It requires only that you can type it into the computer (PDP-8/E), and type the word "RUN". It will take it from there. The program works entirely with random numbers and simulates buildups and breakdowns of clouds by printing progress reports by the hour until the storm is over. After the storm a complete description of the storm's actions are printed out.

Media Price Code: D1

WORDSEK, WRDGES, LIFE, LIFES1, TICTAC **BASIC8-60**
Submitted by: Christopher Kryzan, Gordon Speer

1. WRDSEK, given the words to be used, will construct a 15 by 15 word search puzzle. The computer will use the number of words you specify, place them in the puzzle at random locations and in random directions, and then print out a word list, solution, and the puzzle.
2. WRDGES will play 'guess the word' with the user. The user will be able to determine the word size (up to 50 characters) and the time in which he has to look at the word. The computer will then generate the word, let the user look at if for the given amount of time, then totally eradicate the word, and ask him what it was.
3. LIFE is a computerized demonstration of Conway's Game of Life as found in Scientific American. This program illustrates the mathematical patterns which result as the organisms on the grid grow and die. Random or determined starting positions of organisms may be used, and the program terminates itself when it has reached an equilibrium.
4. LIFES1 is another version of Conway's 'LIFE.' It works with teletype output.

The population occupies a grid up to 35 wide by 60 long. Excess height is automatically trimmed to save paper. Changes in the population are counted and the run stops automatically when the population reaches a stable pattern.

5. TICTAC will play the game of tic tac toe against the user, trying to pick the move which is most advantageous to the computer. If the operator makes the first move, the computer will play defensively. If the computer makes the first move, it will play offensively. The board is printed out after the computer's move.

Media Price Code: D2, G10

Bowling League Tabulator **BASIC8-61**
Submitted by: Philip Bujalski

Abstract: This program automates the tabulation of a bowling league for any amount of teams with any amount of bowlers on the teams. For each bowler, total pinfall, total games, average, high game, low game and high triple are calculated.

Media Price Code: D2, G5

NANCY.BA **BASIC8-62**
Submitted by: Peter W. Dowrick
Operating System: OS/8

Abstract: This program, written in OS/8 BASIC, simulates the playing of tic tac toe, with randomization of differing strategies and blunders, at four different levels of probability.

Media Price Code: D2, G5

MAMII and MAMID **BASIC8-63**
Submitted by: F. G. McIntosh

Abstract: "MAMII"–input version, "MAMID"–data version. The programs provide the functions of addition, multiplication and inversion using either 'input' statements of 'read' and 'data' statements. Both programs allow retention of solutions so that 'chain-type' calculations may be performed. Real matrices only.

Media Price Code: D2, G5

NAMES **BASIC8-64**
Submitted by: Malcolm Slaney

Abstract: This is a simple program to punch out names and other messages on tape. Messages of any size that can be handled by the LINPUT command will be punched. It is also possible to specify whether the letter or the background should be punched. All alpha-numeric characters can be punched, and new characters, such as Christmas trees, are easy to add.

Media Price Code: D1, G5

Butler Area School District Computer Mathematics Series **BASIC8-65**
Submitted by: Keith Henry, John Koehring, Albert Stewart
Operating System: TSS/8
Source Language: BASIC

Abstract: A series of mathematics programs for individual testing on math problems at various levels. Provisions are made for alternative questions for "retakes" at each level. Complementary programs allow for printout of sets of problems on spirit ditto masters and for the teacher to get an answer sheet for the ditto handout. An achievement ideograph program gives explicit student achievement records.

Note: This DECtape is in TSS/8 format and cannot be read by OS/8. TSS/8 V22B or TSS/8 V24 is required.

Media Price Code: A6, H32
Format: TSS/8

CLILAC, LILAC Conversion **BASIC8-66**
Submitted by: Brett Fleisch
Operating System: EDU-25
Source Language: BASIC

Abstract: This version of LILAC (BASIC8-39) retains all the original commands, but is modified for EDU-25 BASIC. The number of lines has been reduced due to the occasional usage of the SHIFT/L command. Its highest line number is less than 2046. Also, two additional useful commands have been added.

Media Price Code: D2, G5

TSSTLK: BASIC Language Communications Package for the TSS/8 **BASIC8-67**
Submitted by: Reed Christiansen
Operating System: TSS/8

Abstract: TSSTLK utilizes a data file, TSSTKF, to transmit and receive messages to and from other terminals.

Media Price Code: D1

BASIC Storage **BASIC8-68**
Submitted by: Sandra A. Howell
Source Language: 8K BASIC

Abstract: BASIC Storage is a program written in the 8K BASIC language to accept an integer from the teletype and convert it to its 27 bit floating point equivalent. The integer is restricted to numbers between E ± 38 and can be input as integers, decimal integers, or integers expressed in E format. The output is the octal of words 1, 2, and 3 respectively, in the floating point accumulator.

Media Price Code: D1

CHESS **BASIC8-69**
Submitted by: Andy Kent
Operating System: EDU-25
Source Language: BASIC
Memory Required: 12K

Abstract: Allows two people to play a game of chess using a computer as a board and a move recorder. The computer does not check for illegal moves. When the game is over, the computer prints the final position and every move for both white and black that was made.

Media Price Code: D1, G5

PISTOL: Practically Instantaneous Scheduling Typed On-Line **BASIC8-70**
Submitted by: Andrew R. Bradbury
Operating System: TSS/8
Source Language: BASIC

Abstract: PISTOL is a BASIC source program devised to rapidly produce student schedules for various uses. It was originally designed to schedule student usage of a computer terminal, but may be used for many other scheduling problems.

Note: Disk storage required (Could be modified to use DECtape)

Media Price Code: D2, G5

CALC **BASIC8-71**
Submitted by: Jesse Heines
Operating System: OS/8
Source Language: BASIC

Abstract: CALC allows you to input any valid BASIC numerical expression and prints out the value of that expression on a CLASSIC or OS/8 system.
This program uses one BASIC language program to write another, CHAINs to a newly written program, and then CHAINs back to the original one.

Media Price Code: D1, G5

Great Circle Course and Distance **BASIC8-72**
Submitted by: G. Brent Dalrymple
Operating System: OS/8
Source Language: BASIC

Abstract: This program computes the great circle distance, the initial course angle, and the initial great circle course from the latitude and longitude of the points of departure and destination.

Media Price Code: D2, G5

POSTER **BASIC8-73**
Submitted by: Bradford Huntress
Operating System: EDUCOMP EDU250 under OS/8
Source Language: EDUCOMP EDU250 BASIC
Special Hardware Required: PDP-8/E with 3 teletypes and single DECtape unit

Abstract: This program, an adaptation of BANNER, was designed to run under EDUCOMP EDU250 BASIC, but can easily be adapted to other BASICs as well. All letters now have rounded corners where appropriate, and no two characters, except the letter O and the number zero, are the same.

Media Price Code: D2, G5

PING-PONG **BASIC8-74**
Submitted by: Edward J. Quigley
Operating System: EDU-20
Source Language: BASIC
Special Hardware Required: 8K - 3 user PDP-8/L, any terminal

Abstract: This program allows you to play Ping-Pong against the computer, in a manner similar to that of game room machines. Properly hit balls are returned by the computer. Play continues until the program beats the opponent in a 7-0 shutout.

Media Price Code: D1

SINCOS: SIN and COS Functions Graphing Program **BASIC8-75**
Submitted by: Geoffrey Mandel
Source Language: BASIC

Abstract: SINCOS allows the user to select the vertical limit of the θ (Theta) axis, in either real numbers or multiples of π (Pi). The program will then print out a graph of the SIN and COS functions, from 0.1 to the specified limit (in vertical steps of 0.1). The SIN wave is represented by a series of "*"s, and the COS wave by "+"s. The unit spacing along the θ and F (θ) axes is approximately equal. Multiples of Pi are indicated along the verticle axis.

Restrictions: SIN, COS and specialized use of TAB function necessary to run program.

Media Price Code: D1, G5

GAMES, Set 4 **BASIC8-76**

SIERAC–A game of skill and luck

GUNNER–Simulation of a gun battle

MAGIC SQUARES–Will print a 5*5 magic square

BLACKJACK–A game of blackjack

VOTE–Simulation program which conducts elections featuring up to six candidates

Media Price Code: D2

STREK–STAR TREK **BASIC8-77**
Submitted by: Christopher Starr
Operating System: EDU-25
Source Language: BASIC

Abstract: A version of the STAR TREK game which simulates a battle between the starship Enterprise and a Klingon vessel. It requires 8 blocks.

Media Price Code: D2, G5

INDY 500 Survival Tests **BASIC8-78**
Submitted by: Steven Rabin
Source Language: BASIC

Abstract: This racing game simulates a 3,000 unit raceway on a BASIC system with the backslash or: statements and string variables. It requires 7 blocks.

Media Price Code: D2, G5

MIS1, MIS2 **BASIC8-79**
Submitted by: Joshua Mogal
Source Language: BASIC

Abstract: This program plays a game which simulates the "Mission Impossible" program. It requires 6 blocks.

Media Price Code: D1, G5

Geometry Routines, Prime Numbers, Buffon's Needle Theorem, Markov **BASIC8-80**
Submitted by: Joe Bowbeer
Source Language: BASIC

Abstract: GEOMTR is a group of 6 routines incorporated into a single program to aid in the solving of geometry problems.
LOAD, TABLE and FACTOR are three routines for working with prime numbers.
BUFFON approximates Pi using geometrical probability.
MARKOV executes the Ehrenfest model for illustrating a Markov chain.

Media Price Code: D2

JUMBLE; ONETWO **BASIC8-81**
Submitted by: Joe Bowbeer
Source Language: BASIC

Abstract: JUMBLE is a game in which the user tries to unscramble ten words. Funny dialogue and bell-ringing may or may not be an asset.
ONETWO is a game of chance played with the computer. Points are awarded on how the choices relate to each other. The computer plays the best odds.

Media Price Code: D2

SADSAC **BASIC8-82**
Submitted by: Brother Joseph Autin, S. C.
Source Language: EDUsystem 20 BASIC

Abstract: In an effort to aid high school students in their study of computer science, the SAD/7400 "computer" simulation with a representative instruction set (including indirect addressing and floating point options) provides experience with a decimal machine code. The SAC compiler allows the student to write an assembly-level symbolic program which is translated into SAD machine instructions.

Media Price Code: D2, E2, G8

PLTPKG: Mathematical TTY Plotting Package **BASIC8-83**
Submitted by: Brother Joseph Autin, S. C.
Operating System: EDU-2
Source Language: BASIC

Abstract: This package contains six TTY plotter programs as described below.

1. FTNPLT (Functional Plotter) allows the user to define the function Y = f(X) in a manner similar to that used in high school algebra.
2. RELPLT (Relational Plotter) will plot any relation defined in terms of X and Y. The relation must be defined in the form 0 = R(X, Y).
3. MULPLT (Multiple Relational Plotter) allows the simultaneous plotting of a maximum of 5 relations in the same section of the coordinate plane.
4. PRAPLT (Parametric Relational Plotter) allows the plotting of a relation 0 = R(X, Y) where the X and Y are themselves defined in terms of the parametric variable A.
5. POLPLT (Polar Coordinate Plotter) will plot a *function* of the form Rho = f(Alpha) on a polar coordinate grid.
6. SURPLT (Surface Plotter) attempts to plot a "bird's eye view" of a surface defined by a *function* of the form Z = f(X, Y). The graph somewhat resembles a topological map, where the letters used in the graph indicate the relative "height" of the range. The output is not printed in three-dimensional perspective.

Media Price Code: D2, G26

PLOTTY: A Program to Plot a Function On a Teletype **BASIC8-84**
Submitted by: Jorge Paloschi, Argentina
Source Language: 8K BASIC

Abstract: This program plots through a teletype any one variable function, printing the axis if they are within the plotting domain.
It allows the user to choose the graph scale and also to apply a function to the ordinates (as to get semilogarithmic graphs, for example).
The program was designed to minimize the graph printing time.

Media Price Code: D2, G5

FOOTBALL **BASIC8-85**
Author: C. R. Desper
Army Materials and Mechanics Research Center, Watertown, MA
Source Language: BASIC-8

Abstract: The program matches two players in a simulated football game, running under BASIC-8. The offensive team may select from six plays, plus punt and field goal attempt while the defense is chosen from four patterns, plus attempted block of kicks. The offense enters its plays through the teletype, while the defense is entered through the switch register, using the special UUF(X) patch. Play is timed against a software "clock;" each side is allowed three "time outs" per half. The duration of the game is four quarters, with additional periods in the event of a tie score. Actual time for a game averages 40-60 minutes.

Media Price Code: D1, G8

GAMES–SET 5 **BASIC8-86**
Author: B. D. Fleish, J. A. Zec, R. E. Salz, E. Fisher

BASIC-86.1 PLBUNY–Prints a facsimile of the Playboy bunny.

BASIC8-86.2 TEN-UP–Random number selection with a subtraction by the computer. Point of the game is to reach a total of 10. Edu 20 BASIC.

BASIC8-86.3 GUESS–Guess a number in as few tries as possible. Designed so that more than one person can play. Edu 25 BASIC.

BASIC8-86.4 PONG–Utilizes VT-50 display and OS/8 BASIC to emulate the well-known home entertainment game.

Note: Papertapes include PLBUNNY, TEN-UP, and GUESS only. PONG tape is not available.

Media Price Code: D2, G7

BSC12K: A Modification to 8K BASIC Extending the Number of Variables **BASIC8-87**
Author: Jorge Paloschi
Universidad Nacional del Sur, Bahia Blanca, Argentina
Source Language: PAL-III
Memory used: 64 words
Other Software Required: 8K BASIC Interpreter

Abstract: A modification of "8K BASIC" that allows one to have an additional array of 1322 elements in field 2 is presented. Further, the dimension of the new array can be extended up to 4096 elements with only minor changes in a 20K configuration.

Note: (Documentation in Spanish–Abstract and listing comments are in English).

Media Price Code: D2, F5

BASIC8 Switch Register Function **BASIC8-88**
Author: C. R. Desper
Army Materials and Mechanics Research Center Watertown, MA
Source Language: PAL-III
Memory Required: 8K
Other Software Required: BASIC-8

Abstract: This patch for the BASIC8 programming system permits input of numerical data through the switch register. Data is strobed in when switch zero is thrown up, then down. The subroutine is accessed through the UUF (X) function and the TAB function is dropped. The patch is used in the two-player version of the BASIC FOOTBALL game. (BASIC8-85a).

Media Price Code: D1, G5

Rational Roots of a Polynomial Equation **BASIC8-89**
Author: Andrew Linn
Miss Porter's School, Farmington, CT
Source Language: BASIC

Abstract: This program will determine the rational roots of any polynomial equation. If there are no rational roots, the program will tell you so.

Media Price Code: D2

Math and Simulation Programs for Educational Use **BASIC8-90**
Author: Walter D. Bartlett
Tasmanian College of Advanced Education
Operating System: EDU 25
Source Language: BASIC

Abstract: A system of linked general purpose mathematical and computer simulation programs for use in an educational environment.

Media Price Code: D6, H32
Format: OS/8

BASIC8 Single Key Reader **BASIC8-91**
Author: Jeffrey Shrager
Radnor High School
Operating System: OS/8
Source Language: PAL-8
Other Software Required: OS/8 BASIC

Abstract: It is often convenient to be able to read a single keystroke in the process of a BASIC program. Normal input is done via the INPUT statement, but this method requires that the user type a return at the end of input. KEYIN permits the program to poll the terminal for keystrikes and read and process these keys without having to stop the program and wait for input.

Restrictions: BRTS User Overlay Area

Media Price Code: D1

Symbolic Editor Program **BASIC8-92**
Author: Christopher A. Kryzan
Northwestern University, Chicago, IL
Operating System: EDU-30
Source Language: BASIC
Memory Required: 4K

Abstract: Text-editing and word processing facilities are welcome and desired on all computer systems, including small systems with only one available compiler at one time period. In order to provide editing capabilities on even these small systems, EDITOR was created. BASIC was seen as one of the most abundant system languages in use on small high-school-systems, and thus EDITOR was designed in the BASIC language. Text-editing capabilities similar to standard DEC editors and a character capacity of up to 6600 characters serve to enhance EDITOR's attractiveness.

Media Price Code: D6, G7

Scrambled Word Generator **BASIC8-94**
Author: Christopher A. Kryzan
Northwestern University, Chicago, IL
Operating System: EDU-30
Source Language: BASIC

Abstract: Oftentimes instructors wish to supplement their lectures with extraordinary teaching aids. One common method utilized by teachers is scrambled word lists. In order to increase the ease with which lists can be compiled, SCRMBL was created. This program will scramble words in lists of up to 150 characters (or more on larger computer systems). An attractive feature of this program is its ability to generate multiple for mass distribution.

Media Price Code: D1, G5

MADMAZ Maze Generator **BASIC8-95**
Author: Christopher A. Kryzan
Northwestern University, Chicago, IL
Operating System: EDU-30
Source Language: BASIC

Abstract: Computers have many non-scientific applications in addition to their technical side, one of which is found in demonstrations and gaming. An interesting sub-genre of this is the construction and solution of puzzles. MADMAZ is designed to create 15 × 15 maze puzzles, replete with solutions as well. Execution can be quite lengthy, but the results are well worth the wait.

Media Price Code: D2, G5

Paper Tape Message Generator **BASIC8-96**
Author: Christopher A. Kryzan
Northwestern University, Chicago, IL
Operating System: EDU-30
Source Language: BASIC

Abstract: A variety of programs to produce punched tape messages have been published, but this particular version proves to be one of the most efficient yet designed in BASIC. The program consists simply of a data list of characters and a routine to enter and output the message, creating punched tape records of up to 400 characters in length.

Media Price Code: D1, G5

HOCKEY **BASIC8-97**
Author: Joseph Cannata
State University of New York at Stony Brook, NY
Source Language: BASIC

Abstract: This version of HOCKEY is designed to simulate almost every facet of the game. To start, the rink was divided into 24 zones with an odd-even numbering scheme. This allowed control and monitoring throughout the program. Because of this system, icing, offside passes, and passing could be built in. Icing and offsides are checked by differences in zones. Passing is based on a probability of completing a pass, depending upon whether it is a long or short pass, or whether it is a lateral or back pass.

Restrictions: This program was written for use on a Univac 1110 computer, and will require modification for use on most other versions of BASIC. There are approximately 350 lines of code.

Media Price Code: D2

Compass Deviation **BASIC8-98**
Author: G. Brent Dalrymple
U.S. Geological Survey, Menlo Park, CA
Operating System: OS/8
Source Language: BASIC
Memory Required: 8K

Abstract: This OS/8 BASIC program calculates the deviation of a boat's compass using the relative bearing of a celestial body and the Time Azimuth method. A knowledge of the compass heading, the boat's position, the local magnetic variation and the GHA and declination of the body are also required. The program will accept up to 51 data sets for various compass headings and completes execution by printing a deviation table. The program runs in 8K of core.

Media Price Code: D2, G5

Bowling Record Tabulator **BASIC8-100**
Author: Jerry N. Rabinowitz
Claymont School District, Claymont, DE
Operating System: Paper Tape
Source Language: BASIC-8
Memory Required: 8K
Special Hardware Required: Teletype recommended

Abstract: This two-part program will tabulate weekly records for a bowling league with twelve four man teams; but, can be used for leagues with any number of teams, and any number of bowlers. It will run under virtually any version of BASIC—*NO* string handling capabilities are required.

Media Price Code: D2, G8

Battle of Numbers **BASIC8-101**
Author: Brad Tebow
Camelback High School, Phoenix, AZ
Source Language: BASIC

Abstract: The first question asked by the program (besides if you want instructions) is "Beginning number". The answer to this question should be an integer greater than 15. The next question is "Maximum to be removed". The answer should be an integer between 4 and 14 inclusive.
You and the computer will take turns removing a number equal to or less than the number inputted as the maximum to be removed. The object of the game is to force the computer to remove the last number.

Media Price Code: D1, G5

Collection of Math and Demonstration Programs **BASIC8-102**
Author: Joe Bowbeer
Clinton High School, Clinton, IA
Operating System: TSS/8
Source Language: BASIC

Abstract: Eight programs are included in this package. They are:
1. Extended Precision Square Roots
2. Extended Precision Log Base Ten
3. Poetry–composes free verse.
4. Ellipse and Circle Plotting
5. CHANGE–reverses the order of a line of text.
6. Arithmetic and Geometric Sequences
7. Coefficients, Probabilities, ESP Test
8. Repeating Decimals

Media Price Code: D4, G6

CARD: Simplified Machine Language Simulator **BASIC8-103**
Author: John Tyson II
Submitted by: Samuel M. V.
Tatnall–Haverford School, PA
Operating System: OS/8
Source Language: BASIC V3.21

Abstract: CARD is a comprehensive simulator for CARDIAC, a simplified machine language developed by Bell Telephone Laboratories for teaching elementary programming concepts. CARD, written in OS/8 BASIC, interprets and executes CARDIAC programs, while also providing editing, tracing and listing capabilities. Input comes from cards or keyboard, and output can be directed to the console or line printer. Fully interactive and diagnostic, it is easy to use and very useful in an educational environment. Complete instructions and four sample programs are provided. CARD assumes a VT-50 or VT-52 terminal and requires 16K words of memory.

Media Price Code: D2, K27
Format: OS/8

QCHESS: Quigley's Algebraic Chess Program **BASIC8-104**
Author: Edward John Quigley
Levittown, NY
Source Language: BASIC

Abstract: QCHESS is a Chess game written in BASIC that uses an algorithmic model of the game of Chess. The program as submitted to DECUS represents the end of about two years of work. Originally written for the PDP-8, QCHESS has been run on several different computers.

Media Price Code: D2

Section 2.3
FOCAL8 ABSTRACTS

Pseudo Random Number Generator for use with FOCAL **FOCAL8-1**

Author: Gary A. Griffith
Georgia Institute of Technology, Atlanta, GA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: A pseudo random number generator adapted to the PDP-8 computer has been tested for randomness and uniformity. The test for randomness shows a definite bias. However, this generation algorithm compares favorably with others presently being used. It was written to replace the random number generator of the 4K FOCAL language.

Media Price Code: D2

The Sumer Game **FOCAL8-5**

Author: Doug Dyment,
Digital Equipment of Canada, Ltd., Carleton Place, Canada
Source Language: FOCAL

Abstract: This is a simulation program/game which will run on a minimal PDP-8 system. The economy of a Sumerian city in the year 3000 B.C. is simulated in the fashion of a modern-day "business game."

Media Price Code: D2, G5

Hexapawn **FOCAL8-9**

Author: Ralph Mayer
Submitted by: Walter Koetke,
Lexington High School, Lexington, MA
Source Language: FOCAL
Memory Required: 8K

Abstract: The object of this program is to have the computer "learn" to play a game, called Hexapawn.
Hexapawn is played on a square board and each player has three pawns. A pawn can move forward to an empty space or diagonally forward to capture an opponent's pawn. One wins by having any one of his pawns reach the opponent's side of the board, by making it impossible for the opponent's pawn to move, or by capturing all of the opponent's pawns.
The computer "learns" to play this game by remembering each of the possible board configurations when it is encountered during a game, and then determining and remembering all of the possible moves applicable to each board configuration.

Media Price Code: D2, G8

FOCAL: How to Write New Subroutines and Use Internal Functions **FOCAL8-17**

Author: Doug Wrege
Georgia Institute of Technology, Atlanta, GA
Operating System: Paper Tape

Abstract: This document is an attempt to explain how user-developed software can be interfaced to the basic FOCAL package, without requiring the user to spend valuable time trying to understand all of its detailed workings. Section II deals with a general discusson of how FOCAL works, in a descriptive fashion. Section III is concerned with the philosophy of the language, and the last few sections are technically oriented toward helping the user actually code his additions. Several examples and ready-coded routines, which may be used to simplify the user's problems, are included.
An extension of this document is offered as DECUS NO. FOCAL8-271. (See abstract)

Restrictions: Although this document was written for use with FOCAL '69 and earlier versions, most of the information is still applicable.

Media Price Code: E4

Least Squares Fit to an Exponential **FOCAL8-19**

Submitted by: J. W. Lynn,
Georgia Institute of Technology, Nuclear Research Center, Atlanta, GA
Source Language: FOCAL '68

Abstract: This program is used in conjunction with "FOCAL" to make the best two parameter least squares fit of

$$Y = A*EXP(ALPHA*X)$$

to the user's data.

Media Price Code: A2, G5

MULTIPULSE **FOCAL8-20**

Author: Chris Hamilton,
Georgia Institute of Technology, Atlanta, GA
Source Language: FOCAL

Abstract: A FOCAL program for use on PDP-8 to check the differential linearity of a multichannel pulse height analyzer.

Media Price Code: D3, G5

Curve Fitting **FOCAL8-26**

Author: Richard Rothman,
Groton School, Groton, CT
Source Language: FOCAL

Abstract: This program finds the best curve of a set of points. There are three types of curves involved: 1) Exponential Curve, $Y = Ae^{BX}$; 2) Power Curve $Y = AX^N$; 3) Linear Line $Y = MX + B$.

Media Price Code: D1, G5

Simple Chi-Square Test **FOCAL8-40**

Author: Michael J. McKeown,
University of Chicago, Chicago, IL
Source Language: FOCAL '68

Abstract: The program will type out the data matrix and cell contents. Each cell will contain two values: O = xxx.xxx and E = xxx.xxx. The "O=" number is the "OBSERVED" value which was typed in by the

FOCAL8-40 (Cont.)

user. The "E=" value is the expected value calculated by the program. The program will also type out row sums (RS=) and column sums (CS=), and the grand total (T=). The last line of output will be ? X2 = ? and ? DR = ?. These are the CHI-SQUARE and degrees of freedom.

Media Price Code: A2, G5

FRAN THE BARMAID **FOCAL8-41**

Author: Dr. Murray Vernon King,
Massachusetts General Hospital, Boston, MA
Source Language: FOCAL '68

Abstract: A demonstration program which uses the random number generator to choose cocktail ingredients and their quantities.

Media Price Code: D2, G5

The Hangman Game **FOCAL8-42**

Author: Dan Miller,
Glastonbury, CT
Source Language: FOCAL '68

Abstract: The program allows the user to play the game of Hangman with the computer, that is, a word guessing game using a limited number of trials at the letters in the word. Will run in 4K if extended functions are removed.

Media Price Code: D2, G5

A FOCAL Program to Determine Low-Frequency Loudspeaker Parameters Experimentally **FOCAL8-48**

Author: Richard Merrill and Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program is a FOCAL translation of a program devised by J. P. Ashley and M. D. Swan used in determining the low-frequency characteristics of loudspeakers for use in speaker system and enclosure design. The method allows determination of speaker parameters using a minimum of testing equipment.

Media Price Code: D2, G5

Constantine's Function **FOCAL8-49**

Author: Richard May,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69

Abstract: This routine is the solution and graphical output of the function:

$$M(\sigma,\zeta) = \frac{4}{\pi} * \sum_{n=0}^{\infty(N=6)} (-1)^N * e^{\frac{-(N^2+1)}{2}} * \left(\frac{2\sigma}{\zeta}\right)^2 x\pi^2$$

as $\frac{2\sigma}{\zeta}$ varies from 0 to 1.

Media Price Code: D1, G5

FOCAL Version of RC Active Filter **FOCAL8-50**

Author: Bean and Roman,
University of Texas, Southwestern Medical School, Dallas, TX
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program is a FOCAL version of a program by Kincaid and Shirley as published in Electronic Design Volume 13. Derived from two fundamental equations, it can be used to design Butterworth or Chebyshev filters in either low-pass or high-pass versions of each. (See also FOCAL8-175)

Media Price Code: D2, G5

FOCAL 5/69 **FOCAL8-52**

Author: Edward A. Taft III
Manchester, MA
Operating System: Paper Tape
Source Language: PAL-III
Memory Required: 4K

Abstract: This is a new version of FOCAL, based on FOCAL W, 8/69, which has been expanded and rewritten to remove numerous bugs and restrictions and to provide a large number of new commands and extended capabilities. Some of the new features are:

1) Better control over I/O devices, including high speed punch; 2) New I/O formats, including buffered input that accepts expressions as well as numbers, input and output of single ASCII characters, and a tabulation controller; 3) A group of "OPTION" commands that perform minor functions such as suppressing or restoring keyboard echo and changing I/O modes; 4) A more compact extended function package, resulting in an enlarged user area; also a command for deleting the extended functions; 5) Extended command formats, also a provision for using calculated line numbers.

Media Price Code: A2, F10, H32
Format: OS/8

Channel Information and Inverted Histogram Plot **FOCAL8-54**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69

Abstract: This program will accept up to 36 channels of information stored as A (I) during 'T' passes. It will then plot an inverted histogram using the symbol '[ ],' spacing through vacant channels, and subtracting one count till all channels are vacant.

Media Price Code: A1, G5

Multichannel Analyzer **FOCAL8-55**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This general program, Multichannel Analyzer, also includes a specialized version for the reduction of raw grades from the teacher's rank book to the letter grades specified for report cards. The method of visualizing scores is entirely the work of Kenneth L. Russell of Sam Houston State Teachers College, and quite adequately described in his publication 'Visual Grading' available from Educational Filmstrips, also of Huntsville, Texas.

The program will operate in 4K with the extended functions retained (they are not used) for at least 32 sets of data.

Media Price Code: D2, G5

A System for Production of Problem Sets with Individualized Data **FOCAL8-60**

Author: H. Bradford Thompson,
Department of Chemistry, University of Toledo, Toledo, OH
Source Language: FOCAL '69 and PAL-III

Abstract: This system produces problem sets for use in science and mathematics instruction, in which input data are changed for each student. Two programs are involved, (1) a FOCAL program into which the instructor inserts the algebra required to perform the calculations, and (2) a program which accepts a text with data positions marked, and then inserts individualized data from the FOCAL program (without the answers) and prints the copies.

Media Price Code: D2, G5

Least Square Fit to a Polynomial **FOCAL8-61**

Author: Adrian Demayo,
Department of Energy, Mines and Resources, Inland Water Branch, Water Quality Division, Ontario, Canada
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Given L1 pairs of points $X_j(obs)$, $Y_j(obs)(j = 1 \cdots L1)$ this program finds the coefficients B_i expression:

$$Y_j(calc) = \sum_{j-1}^{L} B_i X_j^{i-1}(obs) \qquad L = NA \cdots NB$$

$$j = 1 \cdots L1$$

Media Price Code: D2, G5

CURFIT **FOCAL8-63**

Author: Donald L. Shirer,
Valparaiso University, Valparaiso, IN
Source Language: FOCAL '69

Abstract: CURFIT is a program written in the FOCAL language which fits weighted or unweighted data to a straight line on a Cartesian, log-log or semilog graph. It calculates the slope and intercept of the line, the standard error in these values, plus other measures of the "goodness" of fit. Values may be added or deleted from the data list easily, and there is no limit to the number of sample data pairs.

Media Price Code: D2, G5

Newton-Raphson Method for Determination of Polynomial Roots **FOCAL8-64**

Author: Dan C. Stanzione,
Electrical Engineering, Clemson University, Clemson, SC
Source Language: FOCAL '68
Memory Required: 4K

Abstract: This program is used to determine the 'n' zeroes of a polynomail, f(x), where

$$f(x) = a_0 + a_1 x + \cdots + a_n x^n$$

where a_0 and a_n are not equal to zero and $a_0, a_1 \cdots, a_n$ are in general complex.

Media Price Code: D2, G5

Kruskal-Wallis One Way Analysis of Variance by Ranks **FOCAL8-65**

Author: Gene Sylwesiuk and Elliot N. Gale,
SUNYAB, Department of Behavioral Science, Buffalo, NY
Source Language: FOCAL '68

Abstract: This is a statistical program which allows the user to test the difference between the means of k groups when the data are not parametric and are independent.

Media Price Code: D2, G5

"QUICK SCAN" Using Scheffe's Calculation **FOCAL8-66**

Author: W. P. Ronald
Canada Department of Agriculture, Research Station, Vancouver, British Columbia, Canada
Source Language: FOCAL '68
Memory Required: 4K

Abstract: This program is a modification of "Sheffe's Contrast Between Means" (FOCAL8-16), and is designed to be used in conjunction with FOCAL8-16, or with DECUS 5/8-9. Using the output from an analysis of variance calculation, it quickly supplies the user with a general picture of the significance of group mean differences, at any selected F level.

Media Price Code: D2, G5

T-Test **FOCAL8-67**

Author: Jerry D. Burns,
Exotic Environments Laboratory, Arizona State University, Tempe, AZ
Source Language: FOCAL '68
Memory Required: 4K

Abstract: This program is designed to calculate students' T- ratio for independent samples. The output format gives sample means and variances, standard error of the mean difference, the value of *t*, and the number of degrees of freedom upon which *t* is distributed.

Media Price Code: D2, G5

Determination of Roots of a Polynomial **FOCAL8-68**

Author: A. E. Sapega,
Trinity College, Hartford, CT
Source Language: FOCAL '69
Memory Required: 4K or 8K

Abstract: This program will find all roots, real and complex, of a polynomial. The 4K version consists of four programs. Program I finds a real root. Program II divides the polynomial by the real root, so reducing the order of the polynomial by one. Program III finds complex roots after all real roots have been extracted. Program IV divides the polynomial by a pair of roots to reduce the order of the polynomial by two. An 8K version contains all the above parts in one program.

Media Price Code: D2, G10

Analysis of Variance **FOCAL8-69**

Author: Jerry D. Burns,
Exotic Environments Laboratory, Arizona State University, Tempe, AZ
Source Language: FOCAL '68
Memory Required: 4K

FOCAL8-69 (Cont.)

Abstract: This program is designed to solve the analysis of variance problem for the two-factor completely randomized design, and to table the results of the analysis in a form acceptable for publication in many scientific journals. Both the input and output formats are designed for simplicity and ease of operation.

An alternate form of the program makes possible the evaluation of either one-factor or two-factor designs.

Media Price Code: D2, G5

Analysis of Variance Randomized Block "F" Test **FOCAL8-70**

Author: C. T. Lund,
Canada Department of Agriculture, Vineland Station, Ontario, Canada
Source Language: FOCAL '68

Abstract: The purpose of this program is to isolate variation in an experiment attributable to treatments and replicates, and test this variation for significance.

Media Price Code: D2, G5

Golf Program **FOCAL8-71**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This program simulates the playing of golf, including the shot selection options of club, power and direction together with numerous variations of these selections, to more closely resemble the actual experience of a golfer "on the links."

Note: Takes about one hour for 9 holes.

Media Price Code: D3, G16

General Least Squares Fit **FOCAL8-72**

Author: Harold Metcalf,
SUNY Stony Brook, Stony Brook, NY
Source Language: FOCAL '69
Memory Required: 8K

Abstract: Can be used to fit data to any arbitrary curve (line, exponential, polynomial, Gaussian, Lorentzian, etc.). Curve is specified by the calculation in group 3, so any curve that can be calculated can be fitted to data.

Media Price Code: D2, G5

Linear Least Squares Fit **FOCAL8-74**

Author: Harold Metcalf,
SUNY Stony Brook, Stony Brook, NY
Source Language: FOCAL '69

Abstract: A short, fast simple linear least squares fit (linear regression).

Media Price Code: D1, G5

Blackjack **FOCAL8-75**

Author: Jerry D. Burns,
Exotic Environments Laboratory, Arizona State University, Tempe, AZ
Source Language: FOCAL '68
Memory Required: 4K

Abstract: A modified Blackjack game, written in FOCAL. The game contains standard Blackjack payoffs as well as a "double down" option on hands of 10 or 11.

Media Price Code: D2, G5

Screening Regression **FOCAL8-76**

Author: Dr. Robert G. Miller,
30 Juniper Lane, Glastonbury, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program performs a stepwise multiple linear regression analysis. For a dependent variable Y the program selects or screens from among a number of independent variables a subset (7 or less) of the total number of variables which contains most of the information of the entire set. There is no limit to the number of independent variables used.

Media Price Code: D2, G5

MARX: A Grading Program **FOCAL8-77**

Author: Peter Smith,
Noble and Greenough School, Dedham, MA
Source Language: FOCAL '69

Abstract: This program accepts marks for a class of a given number, for a given number of weighted quizzes and tests, and outputs in tabular form, the students' respective ranks, averages, and relation to the class average (plus or minus, as the case may be). In addition, it gives the class average, and a table showing the distribution of averages along a scale from flunk (below 60) to 100.

Media Price Code: D2, G5

RACK-O **FOCAL8-78**

Author: Daniel Miller,
Glastonbury, CT
Source Language: FOCAL '69

Abstract: A computerized version of the Milton Bradley Company game RACK-O. The object is to try to put a "set" of numbers in numerical order (limitations are put on your changes) before the machine does.

Media Price Code: D2, G5

The Carnival Game **FOCAL8-79**

Author: Evan Suits,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '68

Abstract: The Carnival Game allows the user to play a gambling game involving three dice. Once started, the program produces a monolog explaining the principle and operation of the game.

Media Price Code: D1, G5

FOCAL Lunar Landing Simulation (APOLLO) **FOCAL8-81**
Author: James A. Storer
Submitted by: Walter Koetke,
Lexington High School, Lexington, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program realistically simulates an Apollo moon landing using NASA figures. It begins with module at 0 seconds, 120 miles above the moon, carrying 1600 pounds of fuel, with a velocity of 2600 miles per hour. Upon radar checks of velocity, altitude, remaining fuel, and time each 10 seconds, you may decide upon fuel rate for next time arrival. The object is to land safely on the moon.

Media Price Code: D1, G5

Physical Sine Curve Programs **FOCAL8-82**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '68

Abstract: Consists of:1) Simple Sine Man; 2) Damped Sine on Axis; 3) Sum Shaded Sines; 4) Plot and two physical sine curves; 5) Fourier Synthesis of a Square Wave.

Media Price Code: D2, G16

Gas Law Programs **FOCAL8-83**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69

Abstract: Consists of:1) Ideal Gas Plot P/V; 2) Ideal Gas Volume vs. Temperature; 3) Real Gas Volume vs. Temperature.

Media Price Code: D2, G10

2D Plotter for Serial Experimental Data **FOCAL8-84**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '68

Abstract: This program will accept and plot on TTY up to 40 sets of data (in 4K). The printout is organized to display the Cartesian Space by spacing through values of "Y" and line feeding through values of "X" where these may represent any physical quantities. Following the plotting of data, the display scale factor and the adjusted values for the plotter parameter are typed out by calling for the whole symbol table.

The program was designed to serve as a universal plotting routine in its own right, but is group numbered to facilitate incorporation into some other program as a dedicated display routine.

Media Price Code: D1, G5

Program Replication **FOCAL8-85**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '68

Abstract: This is intended as a vehicle for the essential single line 06.01 which specifies the immediate-mode command.

The FOR command will cause the program presently in core to be typed out the specified number of times with the specified number of lines between each copy of the program.

The search feature was employed to facilitate cutting the TTY paper into individual pages.

The program as provided will make ten copies of itself as soon as it has loaded and the G followed by a CARRIAGE RETURN are read from the tape.

Media Price Code: D1, G5

KCF Temperature Conversion Table **FOCAL8-86**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '68

Abstract: This program expands the usefulness of the sample program listed in Introduction to Programming (DEC). Temperature conversion and table printout is available from any starting temperature (6 digit limit), in any size increment, to any higher temperature. The program may be used to generate tables of any range and subdivision for use in the field, or the range of immediate interest may be run as needed in the laboratory.

Media Price Code: D1, G5

Atomic and Molecular Transition Probabilities in FOCAL **FOCAL8-88**
Author: Harold Metcalf,
Physics Department, SUNY Stony Brook, Stony Brook, NY
Source Language: FOCAL '69

Abstract: This constitutes part of a series of programs for evaluating 3-J and 6-J symbols in the calculation of quantum mechanical matrix elements which was developed at the State University of New York at Stony Brook.

Media Price Code: D1, G5

The Recursive Evaluation of Functions **FOCAL8-89**
Author: A. K. Head,
C.S.I.R.O. Division of Tribophysics, Melbourne, Australia
Source Language: FOCAL '69

Abstract: The evaluation of functions by recursion is a technique which is not often used in computing, but it has proved to be the solution to two different problems in FOCAL. The first was the need for circular functions which were more accurate than the internal functions when using 4-word arithmetic (when the internal functions have only 3-word accuracy). The second was the need for functions which occupy less memory than the corresponding internal functions. A selection of some of the circular and hyperbolic functions which have been used are included in this program.

Media Price Code: D1, G5

Multiplication of Rectangular Matrices **FOCAL8-91**
Author: Carl Bryant
Submitted by: Brother John F. O'Connell,
St. John's Preparatory School, Danvers, MA
Source Language: FOCAL '69

Abstract: This is the author's answer to the suggestion made in DECUS NO. FOCAL8-33 that someone generalize the program to include multiplication of rectangular matrices.

Media Price Code: D2, G5

Horserace **FOCAL8-92**
Author: Gilbert S. Fair,
Digital Equipment Corporation, Maynard, MA
Memory Required: 8K

Abstract: This program simulates a horserace with 9 horses, using a random number generator to produce different results for each race run, and permitting 20 or so bets to be placed on each race.

Media Price Code: D2, G5

Multidimensional Integration by Gaussian Quadrature **FOCAL8-94**
Author: H. Bradford Thompson,
University of Toledo, Department of Chemistry, Toledo, OH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: A subprogram provides multidimensional integration of a known function by Gaussian quadrature. The user may define the function, integration limits, and number of points used. Gaussian quadrature is valuable within FOCAL because of its low error for a limited number of calculated points.

Media Price Code: D2, G5

One-Armed Bandit **FOCAL8-95**
Author: James J. Ward and Larry A. Owens,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is a demonstration of the PDP-8 as a slot machine.

Media Price Code: D1, G5

Multiple Equation Graphing on a Teletype **FOCAL8-97**
Author: R. Bradford Malt,
Wellesley High School, Wellesley, MA
Source Language: FOCAL '69

Abstract: This program graphs up to 9 equations simultaneously on an ASR33 or similar teletype. It requires only one type head pass per line, providing considerable speed. Provisions are made for error condition checks, and correction of specification overflow is automatic.

Media Price Code: D2, G5

3 Dimensional TIC TAC TOE (3× 3× 3) **FOCAL8-99**
Author: Leonard Fertuck,
Saskatoon Research Council, Saskatoon, Saskatchewan, Canada
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program plays a game of 3 dimensional Tic Tac Toe in which the object is to maximize the total number of lines when all cells in the $3 \times 3 \times 3$ cube have been filled. Game rules and operating instructions acomments in this program.

Media Price Code: D1, G10

"HORSERACE" **FOCAL8-101**
Author: William Garcia, Jr.,
Dow Badische, Freeport, TX
Source Language: FOCAL '68
Memory Required: 4K

Abstract: Simple, but a very exciting horserace, based on the frequency of numbers generated. Ten decimal numbers, 0-9, are used for a better distribution. The highest frequency at which a number paired with that of the lowest frequency.

Media Price Code: D2, G5

Solution of Quadratic Equations with Complex Coefficients **FOCAL8-102**
Author: Forrest Howard
Submitted by: Brother John F. O'Connell,
C.F.X., St. John's Preparatory School, Danvers, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The principle basis of this program is from the discussion of quadratic equation with complex coefficients in INTERMEDIATE MATHEMATICS, PART II (SMSG, Yale University Press, 1961), Section 12-5, pp. 707-710. To get around the difficulty of working with the definition of

$$i = \sqrt{-1}$$

since the computer will reject the square root of a negative number, the rectangular form of $z = a + bi$ is converted to the polar form for the operations upon z and then back to the rectangular form for the output. The theorem included in the reference mentioned above indicates that some problems will have two solutions, while others will have only one. The example problems included with this program indicate that this is quite so.

Media Price Code: D1, G5

TEACH **FOCAL8-103**
Author: Edward Steinfeld,
Digital Equipment Corporation, Pittsburgh, PA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is an example of what could be accomplished in the computer aided instruction realm. TEACH is only a sample and does not carry the student beyond the first hour of instruction. The program is divided into three sections: First, the instruction segment; Second, six problems with answers but no explanation; the third section is comprised of an explanation and six problems, with the option to continue or stop.

Media Price Code: D2, G5

The Towers of Hanoi **FOCAL8-104**
Author: Dr. Roger H. Abbott,
Department of Zoology, Parks Road, Oxford, England
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program uses a recursive routine to solve the Towers of Hanoi problem. Either the total number of moves and the time required, or the actual moves, will be typed on the teletype. It is intended as a demonstration of the way in which recursion may be used in FOCAL.

Media Price Code: D1, G5

FOCAL Traveling-Wave Sketches **FOCAL8-106**

Author: Arthur L. Pike,
Tufts University, Department of Electrical Engineering, Medford, MA

Source Language: FOCAL '69

Abstract: This program sketches graphs of the following wave expressions:

$$i(y, t) = A\epsilon^{ay}\sin(10\pi t\beta y) = \mathrm{Im}(A\epsilon^{(a+j\beta)y}\epsilon^{j10\pi t})$$

In this equation, angular frequency $\omega = 10\pi$ radians per second, and propagation constant $r = a + j\beta$; the components of r are positive for an incident wave, with negative values for a reflected wave. Phase constant β is fixed by the program at $\pi/2$, thereby fixing the phase wavelength at:

$$L = \frac{2\pi}{\beta} = 4 \text{ units}$$

Thus, a value of $t = 0.1$ corresponds to π radians in the phase angle. Hence, with $t = 0.05$, the corresponding angle is 90°. Amplitude A is scaled by the program so that the maximum amplitude of any wave will tie in the sketch space.

Media Price Code: D2, G5

NIM **FOCAL8-107**

Author: Kenneth McCord,
Highland Park High School, Highland Park, IL

Source Language: FOCAL '69
Memory Required: 4K

Abstract: The game of NIM consists of three columns of coins where the number of coins in each column is different. The object of the game is, by alternating turns with the computer, to remove all the coins from the playing board. The one who removes the last coin or coins is declared the winner.

Media Price Code: D2, G5

Analysis of Variance for Two-Dimensional Material **FOCAL8-108**

Author: Lars Palmer,
AB Hässle, Pharmacological Laboratory, Goteborg, Sweden

Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program calculates the standard analysis of variance table for a two-dimensional analysis of variance with the same number of replications per group.

Media Price Code: D2, G5

Program to Find Real Roots of a Polynomial Equation of Degree N (an integer) With Real Coefficients **FOCAL8-109**

Author: Jeff Gelpey
Revised by: Brother John O'Connell,
C.F.X., St. John's Prep School, Danvers, MA

Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program uses the NEWTON-RAPHSON method to find the real roots of a polynomial equation of degree N with real coefficients. It has the usual limitations of the above method, but has worked well for a large number of problems found in Calculus and Elementary Functions textbooks.

Media Price Code: D2, G5

Battle of Numbers Game (Newberry College Version) **FOCAL8-111**

Author: Edward D. Huthnance,
Newberry College, Newberry, SC

Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program allows the user to play Battle of Numbers against the computer. The computer usually wins.

Media Price Code: D2, G5

TIC-TAC-TOE (FOCAL) **FOCAL8-112**

Author: Doug Wilson and Mark Linehan
Submitted by: Mr. C. Hamblet,
Governor Dummer Academy, Byfield, MA

Source Language: FOCAL '69
Memory Required: 4K

Abstract: Two versions of this program are supplied. The first may be used with or without extended functions in core. It provides only the basic game logic, with minimal teletype messages. The second must be used without the extended functions in core. It has the following features: 1) Each move is shown in the form of a matrix; 2) Operator cheating is detected; 3) A running score is maintained.

Media Price Code: D2, G5

Acid-Base Titration Curves **FOCAL8-113**

Author: Edgar H. Nagel,
Valparaiso University, Valparaiso, IN

Source Language: FOCAL '69

Abstract: This program is designed to construct a titration curve for the titration of a weak acid (0.1M initial concentration) with 0.1M strong base. The acid may have any number of replaceable hydrogens and the successive pKa values are entered to initiate the plot. The only simplifying approximation is to substitute concentrations for activities.

Media Price Code: D2, G5

Liquid Scintillation Data Processing Program **FOCAL8-114**

Author: Arnold Fish,
Digital Equipment Corporation, Princeton, NJ

Source Language: FOCAL '69

Abstract: Routine for calculating DPM, largest DPM value and plotting DPM data given data as a list of values in the format:

SAMPLE No.	TIME	COUNTS A	COUNTS B	COUNTS SUM
SN	T	CA	CB	CS

Media Price Code: D2, G5

Short Programs for Statistical Analysis Using FOCAL **FOCAL8-115**

Author: D. J. Dowsett and R. Priest,
Atkinson Morley's Hospital, Wimbledon, England

Source Language: FOCAL '69

Abstract: The package includes: 1) Plotting the Normal Curve for instruction purposes; 2) Calculation of the mean and standard deviation values for a single sample; 3) Student's 't' Analysis; 4) 2 × 2 Chi-squared analysis together with an open ended Chi-squared program for testing

FOCAL8-115 (Cont.)

goodness of fit; 5) Least squares correlation program together with a Spearman-rho correlation by rank; 6) Analysis if Variance for two samples with one criterion of classification.

Although designed for medical purposes there is no reason why these routines cannot be used in other faculties.

Media Price Code: D2, G5

ED-50 **FOCAL8-117**

Author: Lars Palmer,
AB Hässle, Pharmacological Laboratory, Goteborg, Sweden
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is an iterative procedure for a least square fit to the function:

$$Y = \frac{A}{1 + \frac{B}{X}}$$; i.e. the dose-response curve.

Media Price Code: D2, G5

Three Mathematical Routines: Powers, Complex Roots, Cube Roots **FOCAL8-118**

Author: Forrest Howard
Submitted by: Brother John F. O'Connell,
C.F.X., St. John's Preparatory School, Danvers, MA
Source Language: FOCAL '69

Abstract:

1. To Raise a + bi to the Nth Power–This program is based on De Moivre's Theorem for raising complex numbers to a given power N. It works with all integral values of A and B and for A and/or B equal to zero. It seems reasonable to assume that it would also work with decimal fractions for A or B. In the illustrative examples the = sign has been deleted to improve the printout of the answers which appear in rectangular coordinate form rather than the trigonometric form.
2. To Find the P Complex Routes of a Real Number N–This program was planned around the geometrical method cube roots of unity. The printout gives the roots in rectangular coordinate form of the complex number.
3. Cube Root Finder–This program gives a very good approximation of the cube root of real numbers.

Media Price Code: D2, G5

CHEMS LAB 5 **FOCAL8-119**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Among the "new breed" chemistry courses designed for secondary application, the 'chemical materials study' (CHEMS) is a favorite which continues to be adopted, adapted, revised, and rewritten. CHEMS LAB 5 is designed to contrast the energy involved in a phase change with that of a chemical change using very simple materials and equipment. It also provides early experience in quantitative investigation by dealing with the uncertainty of measurement, and the ideas of accuracy and precision.

Media Price Code: D1, G5

PFI: Product Form of the Inverse **FOCAL8-120**

Author: James H. Christensen,
University of Oklahoma, Norman, OK
Source Language: FOCAL '69

Abstract: Matrix inversion using the product form useful for parametric studies and linear programming, as well as matrix inversion which is economical in terms of time and storage requirements.

Media Price Code: D1, G5

Play Golf With Arnold Palmer **FOCAL8-121**

Author: David A. Cutler,
Lake Michigan College, Benton Harbor, MI
Source Language: FOCAL–LIBRA Overlay
Memory Required: 8K

Abstract: Simulates a golf game in which the user acts as caddy for Arnold Palmer and has control over what club he uses after his drive. It makes provisions for trees, water and sand traps. The program tallies the score for easy reference.

Media Price Code: D2, G8

Charge Account **FOCAL8-122**

Author: Frederick W. Holzwarth,
George Washington High School, Philadelphia, PA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program is useful in teaching high school students manipulation of subscripted arrays. It also gives academic students an introduction to business application. The data included was taken from one of the types of charge accounts offered by a local department store.

Media Price Code: D1, G5

Analysis of Variance Package **FOCAL8-124**

Author: W. P. Ronald,
Canada Department of Agriculture, Vancouver, British Columbia, Canada
Source Language: FOCAL '68

Abstract: This package contains two programs, a one-way analysis and a two-way analysis with block effects. In both cases, the initial output consists of single sample statistics. These are followed by an analysis of variance table and an F ratio. The analysis of variance tables produced by these programs may be used with an F test, such as Scheffe's or Duncan's to determine whether any significant differences exist between group means.

Media Price Code: D2, G5

PLOTTER **FOCAL8-126**

Author: John W. Smith,
Indiana University, Department of Anatomy and Physiology, Bloomington, IN
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Allows one to utilize the teletype to plot a wide variety of equations (Y = F(X)). The equation is entered as a FOCAL 'SET' command. The program asks the limits of X and generates scaling information to place all data on the graph with maximum resolution. F(X) may include all the FOCAL functions.

Media Price Code: D2, G5

FOCAL-SLOT **FOCAL8-127**
Author: F. R. Johnson,
Dow Badische Company, Freeport, TX
Source Language: FOCAL '68
Memory Required: 4K

Abstract: FOCAL-SLOT is a demonstration program which allows the operator to simulate playing a slot machine.
By repeated use of FRAN () a three digit number is generated. Each digit is evaluated and the proper special character is printed. Operation is continuous until break out by a CTRL/C.

Media Price Code: D1, G5

Probability (2P); From t ("Student") Distribution **FOCAL8-128**
Author: Milton Landowne, M. D.,
U.S. Army Institute of Environmental Medicine, Natick, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Calculates probability that a difference between means is due to chance, when given the number of degrees of freedom and the ratio (t) of the difference between means and the standard error of this difference.

Media Price Code: D1, G5

FOCAL Readable Punch **FOCAL8-129**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The operating program consisting of groups 1 and 2 will punch tape-high readable characters using the low speed punch. Groups 3, 4, 5 constitute the fundamental program which was used to build group 2, and which may be used to change or completely rebuild it.

Media Price Code: A1, G8

FLHSTO **FOCAL8-130**
Author: R. W. Carter,
St. Peter's College, Jersey City, NJ
Source Language: FOCAL '69
Memory Required: 4K

Abstract: FLHSTO is a FOCAL program which first provides a "tight" loop which gathers and counts data values while storing only unique entries. A frequency table and display follow second, and a histogram follows third and last. If storage permits, these sections may be used as subroutines.

Media Price Code: D1, G5

ZAREA **FOCAL8-131**
Author: R. W. Carter and Friedrich A. Graeper,
St. Peter's College, Jersey City, NJ
Source Language: FOCAL '69
Memory Required: 4K

Abstract: After input of two Z segment boundaries and a segment width (tolerance), ZAREA computes by numerical (summation) integration the area of the above segment under the Gaussian curve. Execution time can be decreased by tolerance increases at the expense of accuracy. Tolerance of 0.001 or better produce highly accurate results.

Media Price Code: D1, G5

1-20 Counting Game **FOCAL8-134**
Author: John Ernst,
Mary Holmes College, West Point, MS
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program enables the user to play the 1 to 20 counting game with the computer. The game is played by counting from 1-20 using these rules: Players alternate, and each may say one or two numbers in succession, starting where the other player left off. The one who says 20 wins.

Media Price Code: D1, G5

MODV–Choice **FOCAL8-135**
Author: Arnold V. Fish,
Digital Equipment Corporation, Parsippany, NJ
Operating System: Paper Tape
Source Language: PAL-D
Memory Required: 8K

Abstract: This overlay provides a modified version of 8K FOCAL-69 in terms of variable storage. It enables FOCAL to automatically store variables in field 1 along with the text which is normally stored there via 8K FOCAL. It gives the user more room in field for user created functions. It provides for software protection of the last page of field 1 if desired.

Media Price Code: D2, F5

General Nth Order Regression **FOCAL8-137**
Author: Richard W. Ralston, Jr.,
Olin Corporation, Charlestown, TN
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program does a general Nth order multiple regression on data stored in an FNEW data array. Maximum is 9th order (without logs). Typeout gives coefficients, variances and "F" ratio on each variable, plus total variance and residual variance. The method is Forward Dolittle (see Hunter-Response Surface Methodology).

Media Price Code: A1, G5

WCXT: The Wilcoxon Matched-Pairs Signed-Ranks Test for Non Parametric Data **FOCAL8-138**
Author: G. C. Ongley,
Graylingwell Hospital, Chichester, Sussex, England
Source Language: FOCAL '69

Abstract: A "T" test for non parametric data. It compares differences between two samples of paired data for magnitude and direction, large differences being given more weight than small differences.

Media Price Code: D1, G5

Successive Powers of a Matrix **FOCAL8-142**
Author: J. A. Peperstraete,
Katholieke Universiteit Leuven, Heverlee, Belgium
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program calculates the successive powers of a matrix, up to the highest power the user wants. The program takes never more than three matrices in core, so there is no technical limitation to the

FOCAL8-142 (Cont.)

highest power the user asks for–however one has to take into account the FOCAL precision of 6 digits and the cumulative effect of rounding-off errors. The order of the matrix is limited to 6×6; for matrices up to 9×9, the user has to change the output handling command 01.23.

Media Price Code: D1, G5

Repeated Matrix Multiplication **FOCAL8-143**

Author: J. A. Peperstraete,
Katholieke Universiteit Leuven, Heverlee, Belgium
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The *repeated matrix multiplication* program multiplies an unlimited number of matrices. The intermediary results are typed out only on user's request, so that a considerable amount of time is saved. The user types the input data of all subsequent matrices to be multiplied, at the end he asks the resulting product matrix which is typed out in matrix-like format.

The program detects itself if a new matrix conforms with the result of previous multiplications. The reduced storage volume is the program's major advantage; there are never more than three matrices in core, so, at each moment the total amount of available space (about 85 signed values) has to be divided among these three; e.g. when the previous result is a 3×3 matrix, the new matrix may be of order 12×3 etc.

Media Price Code: D2, G5

Zeller's Congruence/Day of the Week **FOCAL8-146**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69

Abstract: A demonstration program in which Zeller's Congruence is applied to calculate the day of the week following input of month, day and year. Input is self-terminating.

Media Price Code: D1, G5

Checkers **FOCAL8-149**

Author: Paul M. Klinkman,
North Smithfield Jr. Sr. High School, Woonsocket, RI
Source Language: FOCAL '69

Abstract: The computer plays a slightly modified version of checkers using this program. The checkers never land on 32 spaces. This saves 32 variables. Because of the strange nature of the board, checkers can't go off one side of the board to the other side.

Restrictions: Doesn't handle multiple jumps.

Media Price Code: A1, G5

Fast Matrix Inversion for Real Numbers **FOCAL8-151**

Author: Richard Merrill,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '68
Memory Required: 8K

Abstract: This program will invert a matrix up to size 17×17 of real numbers using modified Gauss-Jordan methods. It is translated from DECUS NO. 8-72.

Media Price Code: D2, G5

FACTORS **FOCAL8-155**

Author: Peter DeWolf,
Libertyville, IL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will calculate the prime factorization of a number, x, and print it, print related prime factor information, give square root of x in a perfect square and give other related information.

Media Price Code: A1, G5

Blackjack for FOCAL **FOCAL8-156**

Author: Vincent Perriello,
Taft School, Watertown, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program was written to emphasize the versatility of the PDP-8 FOCAL while serving as an amusement to new or inexperienced users. It occupies nearly all of the buffer space, with the subscripted "card" variables.

Media Price Code: D1, G5

Mileage Program **FOCAL8-158**

Author: Carl Kishline,
University of Wisconsin, Kenosha, WI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Computes the average gas mileage from the fuel consumption and distance, after which it will estimate the cost of fuel for a trip of a given length.

Media Price Code: D1, G5

Non-Parametrics: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test **FOCAL8-160**

Author: Elliott Gale and Gene Sylwesuik,
SUNYAB Department of Behavioral Science, Buffalo, NY
Source Language: FOCAL '68
Memory Required: 4K

Abstract: These are statistical programs which allow the user to test the difference between two independent groups (Mann-Whitney) or between two related groups (Wilcoxon) when the data does not meet the criteria for parametric t tests.

Media Price Code: D2, G5

Wilmot Grading Program **FOCAL8-161**

Author: William W. Wilmot,
Central Michigan University, Mt. Pleasant, MI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The purpose of this program is to average students' grades. It can be used for any number of grades per student. It calculates the average grade for each student, the overall class average, and the class standard deviation.

Media Price Code: D1, G5

Transistor H-Parameter Conversions **FOCAL8-162**
Author: James A. Williams and Robert E. Werner,
Brigham Young University, Provo, UT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will allow the user to convert from one H-parameter to another under control of FOCAL. When the user types "GO" the program will introduce itself and ask questions concerning the type of parameter data one has and the parameter he requires. After the new data is typed out, the program will ask questions concerning circuit gain. The value obtained from this calculation is theoretical since all the program requests is a value for RL (load resistance). The program was written under TSS/8 control, but the ASCII tape available may be loaded in the teletype under control of FOCAL. A binary tape is available for users with a high speed reader and the PIP option.

Media Price Code: D1, G5 (Includes F)

Erlang C Blocking Probability Programs **FOCAL8-163**
Author: Richard R. Plum,
Traffic Systems Engineering Department, Bell Telephone Labs, Inc., Holmdel, NJ
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Three programs are offered: The first computes the Erlang C Blocking Probability; the second computes the Erlang C Blocking Probability and the average delay in seconds; the third computes the Probability of a delay greater than 10 seconds in addition to the above.

Media Price Code: A2, G5

F-(Variance Ratio) Distribution Probability **FOCAL8-165**
Author: Allan S. Fields,
U.S. Naval Ship Research and Development Laboratory, Annapolis, MD
Source Language: FOCAL '69
Memory Required: 4K

Abstract: For X_1^2 and X_2^2. independent random variables following chi-square distributions, with V_1 and V_2 degrees of freedom, the distribution of $F = (X_1^2/V_1^2)/(X_2^2/V_2)$ follows the variance ration distribution. The probability that F occurred by chance, a measure of effectiveness of the experiment, is calculated.

Media Price Code: D2, G5

First and Second Order Partial Correlations **FOCAL8-166**
Author: Dr. William Wilmot,
Central Michigan University, Mt. Pleasant, MI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: D2, G5

Five Statistical Programs for the PDP-8 or PDP-12 **FOCAL8-167**
Author: Stephen J. Mayor,
Medical College of Ohio at Toledo, Toledo, OH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: D2, G5

One-Armed Bandit–PDP-8 Style **FOCAL8-168**
Author: Frank R. Borger,
Michael Reese Hospital, Chicago, IL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: D2, G5

FOCAL Version of the GE Basic Artillery Game **FOCAL8-169**
Author: Ronald A. Wong, Edmund Wong,
San Francisco, CA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: D2, G5

Saint Peter's College Statistical Package **FOCAL8-170**
Author: Professor Robert W. Carter,
Saint Peter's College, Jersey City, NJ
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This package contains 8 programs for statistical analysis with FOCAL. All write-ups are included in one document. The programs and their applications are as follows:

FOCAL8-170.1 FLGPLT–Plots scaled frequency distributions

FOCAL8-170.2 FLBIND–Computes binomial probability Distributions

FOCAL8-170.3 FLPCTL–Computes percentile scores

FOCAL8-170.4 FLSDEV–Computes means and related measures

FOCAL8-170.5 FLHMES–Computes "H," the information measure of noise

FOCAL8-170.6 FLTMES–Computes "T," the information measure of relationship

FOCAL8-170 (Cont.)

FOCAL8-170.7 FLPEAR–Computes a Pearson linear correlation and regression analysis

FOCAL8-170.8 FLSPER–Computes Spearman's rank-order correlation coefficient

Media Price Code: A2, G8

Minnesota Sociology Statistics Programs **FOCAL8-171**
Author: Philip M. Voxland,
Department of Sociology, University of Minnesota, Minneapolis, MN
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program package consists of a series of small statistical analysis programs of interest to behavioral science researchers. Various 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.

Media Price Code: A2, G18

XPON **FOCAL8-172**
Author: David A. Moon,
Wayland High School, Wayland, MA
Source Language: FOCAL '69

Abstract: 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.

Media Price Code: A2, G5

APOLLO II **FOCAL8-173**
Author: David A. Moon,
Wayland High School, Wayland, MA
Source Language: FOCAL '69
Other Software Required: FOCAL LIBRA Overlay

Abstract: 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.

Media Price Code: A1, G5

SYNDIV 5 **FOCAL8-174**
Author: David A. Moon,
Wayland High School, Wayland, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: A2, G5

Modifications and Supplement to FOCAL8-50 RC Active Filter Design and Plot and 3-Pole Butterworth Filters **FOCAL8-175**
Author: G. Chase,
Portsmouth Abbey School, Portsmouth, RI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: A1, G8

Program for Producing Histograms from Clinical Data on Teletype **FOCAL8-176**
Author: Eddy Emons,
Royal Post Graduate Medical School, Hammersmith Hospital, London, England
Source Language: FOCAL '69
Memory Required: 8K
Special Hardware Required: High speed reader
Other Software Required: FNEW Integer overlay

Abstract: 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.

Media Price Code: A2, G6 (Includes F)

Motion Picture Package **FOCAL8-178**
Author: Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: A2, G18

Depth of Field Program for Still Camera Lenses **FOCAL8-179**
Author: Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: 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.

Media Price Code: A1, G5

FOCAL-SORT **FOCAL8-180**
Author: F. R. Johnson,
Dow Badische Company, Freeport, TX
Source Language: FOCAL '68
Memory Required: 4K

Abstract: This is a short routine to sort subscripted arrays by pair interchange. If duplication is found in array (x), then corresponding two elements in array (y) are sorted into ascending order.

Media Price Code: D1, G5

Filter Design **FOCAL8-181**
Author: Ronald Zane,
Institute for Astronomy, University of Hawaii, Honolulu, HI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Filter Design is a program for the design of five passive filters:

1. Constant K High Pass Filter
2. Constant K Low Pass Filter
3. Bridged T Notch Filter
4. Parallel T Notch Filter
5. Lumped Parameter Constant K Delay Line

On line interaction with the program facilitates a compromise between operational parameters and available components.

Media Price Code: D2, G5

First Order Differential Equation: Initial Value Problem **FOCAL8-182**
Author: Algorithm by Runge-Kutta
Submitted by: U. K. Shivadev,
Harvard University, Cambridge, MA
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This program, which offers the 4th order Runge-Kutta method of solving a first order non-linear differential equation, is self-explanatory. Initial value, step size and termination point are to be specified. Results are typed at specified intervals.

Media Price Code: D2, G5

Manpower **FOCAL8-184**
Author: C. C. Wilton-Davies,
Royal Naval Physiological Laboratory, Alverstoke, Gosport, Hants, England
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This is an interactive program for allocating manpower between a number of jobs with different deadlines. The costs of different solutions may be compared, and options of overtime, hiring and firing are available.

Media Price Code: D2, G5

LIFE **FOCAL8-185**
Author: C. C. Wilton-Davies,
RNPL, Alverstoke, Gosport, Hants, England
Source Language: FOCAL '69
Memory Required: 4K or 8K

Abstract: This program is a FOCAL version of the game LIFE, attributed to John Horton Conway of the Cavendish Laboratory in Cambridge, England. The computer plays with a matrix of locations, each of which may start as full or empty. Full locations are said to contain "cells" which survive, die or reproduce according to simple laws.

Media Price Code: D2, G5

SUMER (French) **FOCAL8-186**
Author: J. F. Champarnaud and F. H. Bostem,
Liege, Belgium
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This French language version of HAMURABI (the Sumer Game) is available on both paper tape and PDP-12 LINCtape. On the LINCtape, both FOCAL, 8K and FOCAL SUMER lists are included.

Media Price Code: D1, G5, H32

ANOVA, 2-way, Unsymmetrical **FOCAL8-193**
Author: Lars Palmer,
AB Hassle, Goteborg, Sweden
Source Language: FOCAL '69
Memory Required: 8K
Special Hardware Required: High speed reader helpful

Abstract: This is an analysis of variance program for the two-way classification table. It is a general method to analyze two-way classifications which gives the analysis of variance table and calculated row and column factors for unequal groups and for missing groups.

Media Price Code: A1, G5

Rectangular to Polar Coordination (German) **FOCAL8-194**
Author: Frank Dieter Lehmann,
Hauni-Werke, Hamburg, Germany
Source Language: FOCAL '69
Memory Required: 4K

Abstract: In the original Rectangular to Polar Conversion Program (DECUS NO. FOCAL8-39) the polar to rectangular program works very well, but the rectanar conversion works only if $-90° < \text{angle} < +90°$ which restructs it, this program works for $0° \leqslant \text{angle} < 360°$. The short listing is commented in German.

Media Price Code: D1, G5

All Purpose Graphing Program **FOCAL8-195**
Author: Mike Viola
Submitted by: Robert T. Cronin,
Belmont Hill School, Belmont, MA
Source Language: FOCAL '69
Memory Required: 4K
Other Software Required: FOCAL QUAD

Abstract: This program can plot almost any type of equation through the three options afforded the user in the program. All graphs are inverted and scaled down so that the entire graph fits on the dimensions given the program. This makes selective enlarging of any graph possible.

Media Price Code: D1, G5

Fisher's Exact Test **FOCAL8-196**
Author: Robert M. Smith,
University of Alabama Medical Center, Birmingham, AL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This non-parametric technique is used with 2 × 2 bivariate tables when cell frequencies are insufficient for Chi-square tests. The program prints a table with labels and marginal frequencies and an exact probability of occurrence of the frequency distribution.

Media Price Code: D1, G5

Self-Teaching Program for FOCAL **FOCAL8-197**
Author: Henry R. Bungay, III
Submitted by: T. L. Drake,
Clemson University, Clemson, SC
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program teaches elementary features of FOCAL. The concept is to leave the program to try to use the commands. A guide sheet lists statement numbers for convenient reentry into the teaching program. Although the program is used routinely on a PDP-15 it has been tested by the author on a PDP-8. For use with a PDP-8, with a small memory, earlier portions of the program must be erased to provide room for subsequent portions. It would be very easy to modify the program or to use parts of it in other programs.

Media Price Code: D2, G8

Michaelis-Menten Kinetics **FOCAL8-198**
Author: Stan Vivian,
University of Manitoba, Faculty of Medicine, Winnipeg, Canada
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This is a FOCAL program to provide maximum likelihood estimates of the parameters VMAX and K of the Michaelis-Menten equation. Standard errors and both 95 and 99% confidence limits of the parameters are also provided. Fitted data points and the reciprocals of the estimates are printed out for graphical purposes.

Media Price Code: D2, G5

Stock Market Game **FOCAL8-199**
Author: Ronald Papa,
Hamden High School, Hamden, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This game simulates buying and selling of stocks based on the exchange's most basic principles. The operator has a choice of three different stocks to deal with. Each is preset and rises and falls randomly within a range of ± 3.5. Starting with $10,000 the player continues until all his money and stocks are lost or until he chooses to stop with whatever 'profit' or 'loss' he has taken.

Media Price Code: D1, G5

SIMEQR: 20 Simultaneous Equations in 8K FOCAL **FOCAL8-200**
Author: Arthur L. Pike,
Tufts University, Medford, MA
Source Language: FOCAL '69
Memory Required: 8K
Special Hardware Required: High speed reader recommended.
Other Software Required: DECUS No. FOCAL8-201

Abstract: This program provides solutions of as many as 20 linear simultaneous algebraic equations with real-number coefficients. The program also tabulates the input data with row-column labels for efficient verification.

Media Price Code: D2, G5

Code Generator **FOCAL8-202**
Author: Peter DeWolf,
1244 Oak Trail Drive, Libertyville, IL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will type out a complete Vigenere cipher table, with random first line, for polyalphabetical substitution. It will also type out the corresponding ing table for ease in use. Both tables, or either one alone, can be typed as many times as desired.

Media Price Code: D1, G5

Graph Sketching **FOCAL8-203**
Author: Peter Cornish,
Trinity Grammar School, Melbourne, Australia
Source Language: FOCAL '69

Abstract: This program should prove useful in the study of probability, statistics, areas under curve, etc. After the program is started, the computer asks a number of questions needed to sketch the graph. After the necessary input it then sketches the graph and types the X and Y values for the points plotted.

Restrictions: Can only plot one Y value for any X value.

Media Price Code: D1, G5

Acid-Base Equilibria **FOCAL8-204**
Author: F. R. Johnson,
Dow Badische Company, Freeport, TX
Source Language: FOCAL '68
Memory Required: 4K

Abstract: Acid-Base Equilibria will calculate hydrogen ion concentration, hydroxyl ion concentration, pH, and paH based on a variety of inputs.

Media Price Code: D1, G5

Random Walk/Array **FOCAL8-205**
Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program generates and plots a random two dimensional array.

Media Price Code: A1, G5

A Normally Distributed Random Number Generator in FOCAL **FOCAL8-208**
Author: Stan Vivian,
University of Manitoba, Winnipeg, Canada
Source Language: FOCAL '69

Abstract: This two line program will provide a normally distributed random number from a population of mean zero and specified standard deviation S. Besides the input standard deviation S, the subroutine uses two variables X and Y. The normally distributed number is returned as X. Another version is provided for use with DECUS NO. FOCAL8-150; it is a single line of FOCAL and executes faster. A demonstration program is also included.

Media Price Code: D1, G5

GRFIT: A Simple Least Squares Routine **FOCAL8-209**
Author: R. C. Gross,
Eastman Kodak Company, Rochester, NY
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program accepts data for x and y, where x is known and y has some degree of scatter in the data, calculates the best straight line, gives a correlation coefficient as well as standard errors for the calculated slope and intercept.

Media Price Code: D1, G5

FARRAY: A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL **FOCAL8-216**
Author: Hans Mees and Floor Anthoni,
Medical Biological Laboratory, T.N.O., Rijswijk, The Netherlands
Source Language: PAL-8 PAL-III
Memory Required: 8K

Abstract: FARRAY uses Field 1 from top to bottom (competitively with the text area) for the storage of one- or two-dimensional arrays. Arrays can be defined in integer or 3- or 4-word floating point format. Arrays can be created or deleted dynamically during program execution.

Media Price Code: A2, F5, G8

Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions **FOCAL8-217**
Author: U. K. Shivadev,
Harvard University, Cambridge, MA
Source Language: FOCAL '68
Memory Required: 8K

Abstract: This program solves any two first order ordinary differential equations simultaneously using Hamming's fourth order algorithm.

Media Price Code: D2, G5

Individual Tablet Assay **FOCAL8-220**
Author: L. L. Alber and M. W. Overton,
U.S. Food and Drug Administration, Chicago, IL
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This program was written to process spectrophotometric readings from the laboratory auto-analyzer system. The experimenter performs the analysis in the usual manner and types in the instrumental reading at the computer station. The amount of drug per tablet and percent of declared is calculated and printed out before proceeding to the next entry. Upon completion, the average found per tablet and the average percent of declared is listed.

Media Price Code: D1, G5

LSQ Stern-Volmer: Least Squares Treatment of the General Stern-Volmer Equation **FOCAL8-221**
Author: Dr. James E. Gano and Dr. H. Bradford Thompson,
University of Toledo, Toledo, OH
Source Language: FOCAL '69
Memory Required: 8K
Special Hardware Required: AX08 and XY Recorder recommended

Abstract: The Stern-Volmer Equation, often utilized by photochemists to treat data, in its most general form (reactive and quenchable triplet and singlet states) is processed by an iterative least squares approach applicable to such nonlinear equations.

Media Price Code: D2, G8

Center of Gravity Calculations **FOCAL8-222**
Author: Joel D. Scheraga,
Stamford High School, Stamford, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program, written especially for students of Model Rocketry, enables the user to determine the center of gravity of the rocket: and the weight of the rocket 1. minus the engine; 2. including the engine; 3. at the time of burnout.

Media Price Code: D1, G5

FOCLX, 1972 **FOCAL8-223**
Author: Bob Cronin,
Belmont Hill School, Belmont, MA
Source Language: PAL-III
Memory Required: 8K

FOCAL8-223 (Cont.)

Abstract: This is a 4-user, expanded version of FOCAL 1969, similar to FOCAL, AMITY (DECUS NO. FOCAL8-136). Added features are change core function and examine core function.

Suggestions for application of these functions are included in the write-up.

Restrictions: Tape is punched in XCBL format. (See DECUS 8-672)

No source available.

Media Price Code: A2, F8

SPASTIC: A System for Programming Angles, Scaler and Timer, by Internal Counting **FOCAL8-224**

Author: C. Richard Desper,
Army Materials and Mechanics Research Center, Watertown, MA
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Special X-ray interface DECSPEC 08 0239 D (300Hz clock, data break scaler, solenoid driver, 4 stepping motor drivers)
Other Software Required: FOCAL '69

Abstract: The FOCAL interpreter has been modified to control a simple PDP-8/L interface for X-ray diffraction experiments. Control operations are accessed through a set of FOCAL functions which control four stepping motors, an internal data break scaler, a timer based on crystal clock interrupt, and the X-ray shutter solenoid.

Media Price Code: D2, F5, G14

Loan Amortization Schedule **FOCAL8-225**

Author: Adrian Demayo,
Department of the Environment, Ottawa, Ontario, Canada
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Three computer programs to calculate a loan (mortgage) amortization schedule under various circumstances.

Media Price Code: D2

Frequency Transformation Program **FOCAL8-226**

Author: Klaus Lickteig,
Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany
Source Language: FOCAL '1969 PAL-III
Memory Required: 8K
Other Software Required: MODV-Choice Overlay (FOCAL8-135)

Abstract: Various Fourier transformation methods can be applied when using the Frequency Transformation Program. The following methods are applied:1. Different integration methods: Simpson and trapezoidal integration; 2. Using a lag window: "hanning" and "hamming;" and 3. Fast Fourier Transformation.By means of an example, a Critical Comparison of the methods is made.

Media Price Code: D2, F5, G8

FOCL/F: An Extended Version of 8K FOCAL/69 **FOCAL8-227**

Author: D. E. Wrege,
Georgia Institute of Technology, Atlanta, GA
Operating System: Paper Tape or OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: FOCL/F is a version of FOCAL language which implements several extensions for increased power and versatility. Among these are: user defined functions, user defined interrupt service, execution of machine language instructions from FOCAL, arrayed variables, PS/8 compatibility, line number computation, extended commands, ASCII character commands, links for ease of addition of user assembly-code subroutines, new TTY-high speed reader control commands, a PS/8 overlay is available for file handling from FOCAL, which permits device independent program calling/saving, variable files, and ASCII files. FOCL/F version 12/1/72 is closely compatible with FOCAL-10, the newly released implementation of FOCL/F on the DECsystem-10 by Rob Warnock III at the chemistry department of Emory University. This document includes additions to the earlier version dated 6/1/72.

Media Price Code: A2, B24, F14, H32
Format: OS/8

Great Circle Distance Between 2 Points **FOCAL8-228**

Author: A. Moses,
Computer Applications Engineering Company, El Paso, TX
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Given the degrees and minutes of latitude and longitude of any 2 points on the surface of the earth, this program calculates the angle at the center of the earth between the 2 points and the great circle distance. Uses a spherical earth with 3960 mile radius.

Media Price Code: D1, G5

H-800 Wiring Diagrams **FOCAL8-229**

Author: Thomas J. Ford,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: A DEC H-800-W connector is diagrammed and wire lists, pin diagrams and change orders randomly prepared for it. A second program handles real cases for one connector.

Restrictions: Written specifically for use with FOCAL 5/69 (DECUS No. FOCAL8-52)

Media Price Code: D2, G5

CALCOMP Plotter FNEW PLOTX **FOCAL8-230**

Author: P. R. Bell and M. G. Roberts,
Digital Equipment Corporation, Albuquerque, NM
Source Language: PAL-8
Memory Required: 4K
Special Hardware Required: Calcomp Plotter
Other Software Required: FOCAL '69

Abstract: This FNEW function uses a modified PLOTX to draw lines and reset the current position to any coordinate rather than just the origin.

Media Price Code: D2

Extended Precision Sine and Cosine for 4-word FOCAL **FOCAL8-231**
Author: Dr. H. B. Thompson,
University of Toledo, Toledo, OH
Source Language: PAL-III
Memory used: 5200-5344
Other Software Required: 4 Word overlay to FOCAL '69

Abstract: This patch provides sine and cosine routines commensurate with the extended precision of 4-word FOCAL. Absolute error for arguments less than 2 pi is less than 3×10^{-10}. The routine occupies slightly less memory than the original.

Media Price Code: D2, G5 (Includes F)

Roots by Inverse Interpolation **FOCAL8-232**
Author: H. Bradford Thompson,
University of Toledo, Toledo, OH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This subprogram uses a modified inverse interpolation (regula falsi) method to find roots of any continuous function. The user may write a master program, plus subprograms to calculate the function and to store, print, or employ roots, to fit his individual needs.

Media Price Code: D2, G5

Action Indicator Calculator **FOCAL8-234**
Author: Roger Geffen,
Data Research Associates, Wayland, MA
Source Language: FOCAL '69
Memory Required: 8K

Abstract: A parameter dependent on price and volume is calculated for a succession of days or weeks, and a cumulative total of this parameter is printed out along with the current value and a line number, which may be the day of the month. Some ability to recover from errors, and the ability to terminate the program at will are incorporated.

Media Price Code: D1, G5

MPS Radiation Pattern Program **FOCAL8-235**
Author: John G. Morey,
Marvelwood School, Cornwall, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program will tabulate the radiation pattern shape (in millivolts per meter at one mile) of any vertical element directional antenna array. Extent of tabulation, number of towers and operating values of each tower (based with reference to one common point) are determined by user input.

Media Price Code: D2, G5

Polynomial Curve Fitting (Streamlined Programs) **FOCAL8-236**
Author: Dr. J. H. Battocletti,
Medical College of Wisconsin, Milwaukee, WI
Source Language: FOCAL
Memory Required: 4K

Abstract: Near-ultimate streamlined programs to allow the greatest number of data points and the largest order as possible, are presented. Two are for the normal polynomial; one forces the fit to go through zero. The third uses the Chebyshev polynomial. Point-by-point error and total RMS error are calculated.

Media Price Code: D2, G5

Bond Computations **FOCAL8-237**
Author: Robert Zuch,
White Plains High School, White Plains, NY
Source Language: FOCAL-8
Memory Required: 4K
Other Software Required: FOCAL 4-word overlay

Abstract: The Bond Computations program provides for the valuation of coupon bonds. Given the settlement date, maturity date, par value, coupon rate, and either the yield rate or dollar price of the bond, the program will find the yield rate or dollar price, the principal, accrued interest, and the final money. The program will evaluate bonds called before maturity, and will provide for a commission on the dollar price of the bond.

Media Price Code: D2, G5

Millikan Oil Drop Experiment **FOCAL8-238**
Submitted by: D. Baird, W. McGee, L. Pierce,
White Mountains Regional High School, Whitefield, NH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: FOCAL simulation of the classical Millikan experiment based on the BASIC simulation "CHARGE" produced by D. Scarl, A. Caggiano, and programmed by C. Lasik for the Huntington Two project.

Media Price Code: D2, G5

DIV: Program for Division **FOCAL8-239**
Author: Helmut Doepner,
Institut fur Physikalische Chemie, Kiel, Germany
Source Language: FOCAL '69
Memory Required: 8K

Abstract: Computes and types the repeating decimals that appear in a fraction. Many of the limitations that appear in the program on pages 11-57 and 11-58 of the Programming Languages Manual, 1970, which is useful only for fraction < 1, have been removed.

Media Price Code: D2, G5

Science Fiction Quiz **FOCAL8-240**
Author: Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is a short, multiply choice literary quiz designed expressly for science-fiction readers.

Media Price Code: D1, G5

Satellite Orbital Parameters **FOCAL8-241**
Author: Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL-8
Memory Required: 4K

Abstract: A short program to determine the parameters of orbiting satellites. Inputs of the radius of the planet and the acceleration of gravity at the planet's surface result in information concerning the orbital velocity and period for any stated altitude above 90 miles.

Media Price Code: D1, G5

Solution of Linear Equation Systems with Symmetrically Matrix **FOCAL8-242**

Author: K. Wagner,
Technische Universitat Berlin, Berlin, Germany
Source Language: FOCAL-8
Memory Required: 8K

Abstract: The program gives the solution-vector, an approximate error-vector and the condition number of a linear equation system with symmetrically matrix.

Media Price Code: D2, G8

Analysis of Variance for One-Two- and Three-Treatment Designs for a PDP-8 **FOCAL8-243**

Author: Robert Breaux,
Texas Tech University, Lubbock, TX
Source Language: FOCAL-8
Memory Required: 8K

Abstract: These programs provide a quick and easy analysis of variance. Modification of error terms to fit particular needs in biology, agriculture, medicine, etc., can be done easily. Output includes terms for pooling error terms, mean comparisons and trend analysis.

Media Price Code: D2, G18

HANGMAN IV **FOCAL8-244**

Author: Andrew Layman,
Stamford High School, Stamford, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will allow user to play Hangman with only 4K. It is virtually idiot-proof and simulates non-computer game in playing style almost perfectly.

Media Price Code: D2, G5

Executive and Utility Routines for FOCLX, 1972 **FOCAL8-245**

Author: Robert Cronin,
Belmont Hill School, Belmont, MA
Source Language: FOCLX, 1972
Memory Required: 8K
Other Software Required: DECUS No. FOCAL8-223

Abstract: These routines contain a header change for Quad FOCLX which will change the normal header message to any 12 character string typed by the user; a program to unpack and print a Quad FOCLX user buffer; a binary punch routine, and a tape label program.

Media Price Code: D1, G5

Undefeatable FOCAL TIC-TAC-TOE **FOCAL8-246**

Author: Henry K. Portner
Submitted by: Robert Cronin,
Belmont Hill School, Belmont, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: An undefeatable TIC-TAC-TOE program based upon a "Magic Square Algorithm."

Media Price Code: D1, G5

FOCTXT–Text Input-Output Patch to FOCAL-1969 **FOCAL8-248**

Author: F. R. Johnson,
Dow Badische Company, Freeport, TX
Source Language: PAL-III
Memory Required: One page
Other Software Required: FOCAL '69 (DEC-08-AJAE)

Abstract: FOCAL was developed to be used as a problem solving language. As such, input to a user program is restricted to numeric entries. This patch allows two new functions, FRSC(X) (Read String of Characters) and FTSC(X) (Type String of Characters). These functions allow the user of FOCAL to input and output text that is not included in the body of the user program.

Media Price Code: D1, G5

Payroll Listings and Totals **FOCAL8-249**

Author: John A. Villano,
CAM-A-TON, Waterbury, CT
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This routine uses all 72 characters of the teletype to print payroll information for each employee on one line and also outputs totals at the end of the payroll. A data tape, with leader-trailer between employees, prepunched with the initial ASK information of name, marital status, number of dependents and a one or zero depending upon whether an insurance payment is to be deducted, allows the operator to merely enter the number of hours worked. The routine will handle specified amounts of withholding and will skip FICA when the limit is reached.

Restrictions: Employees names are limited to seven characters and must not end in "E".

Media Price Code: D1, G5

Six Curves–GMS037 **FOCAL8-250**

Author: Joseph P. DiBella,
General Management Systems, Miami Springs, FL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Used to calculate six regression equations for a set of bivariate data. Regression coefficients and the index of determination are computed for a linear equation and five common non-linear equations. The six curve types used are:

1. Y = A + B*X
2. Y = A*B ↑ X
3. Y = A*X ↑ B
4. Y = A + B/X
5. Y = 1/(A + B*X)
6. Y = X/(B + A*X)

There is no input limit for the total number of observations.

Media Price Code: D1, G5

"WORD": Character Generation Using FOCAL's FDIS Function **FOCAL8-251**

Author: Willard L. Craft and Michael H. Jacobitz,
Adrian College, Adrian, MI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: "WORD" is intended as a demonstration of a modification to FOCAL's FDIS function. The game is similar to "Hangman," with

FOCAL8-251 (Cont.)

both the computer and the operator thinking of a word and then trying to guess the other's word, letter by letter. A patch to extend the program's vocabulary is included. Information concerning the modification is also included.

Media Price Code: D1, G5

Solution to Any Equation Involving One Variable **FOCAL8-253**
Author: Peter Cornish,
Trinity Grammar School, Kew, Melbourne, Victoria, Australia
Source Language: FOCAL '69

Abstract: This program solves the equation F(X) = 0 through Newton's method of iteration. The computer asks for F(X), F'(X), and an approximation to X. The computer then works out a better solution, accurate to 6 or 10 significant figures, depending on the sort of FOCAL being used. When there is more than one value for X, the value closest to the approximation will be found out.
This program can be used with FOCAL's extended functions.

Media Price Code: D1, G5

Patch to Allow Computed Line Numbers in FOCAL, 1969 **FOCAL8-254**
Author: Eben F. Ostby,
Hampton, CT
Source Language: PAL
Other Software Required: FOCAL '69

Abstract: This patch loads over the routine XGETLN in FOCAL, modifies that routine to allow for computed line numbers, returns the correct value for LINENO with evaluatable arguments. In addition it still allows the use of the argument ALL.

Note: Diables the ADC function.

Media Price Code: A1, F5, G10

Repeating Decimal **FOCAL8-255**
Author: Glen Larson
Submitted by: Kevin Willoughby
Attleboro High School, Attleboro, MA
Source Language: FOCAL

Abstract: A short, simple program to type the decimal equivalent of two numbers as a repeating decimal. This routine is fancier than the one in DECUS NO. FOCAL8-33, as it can handle fractions greater than one, and the output is self-terminating.

Media Price Code: D1, G5

OPTION $ **FOCAL8-256**
Author: Horace D. Stephens,
Waynflete School, Portland, ME
Source Language: PAL-III
Memory Required: 4K

Abstract: This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) enables two OPTIONs, OPTION $ and OPTION F. OPTION $ makes F a legal variable identifier and makes $ the function label. (FSQT(4) becomes $SQT(4).) OPTION F restores F as the function label and makes F an illegal variable identifier. The patch will work with FOCAL 5/69 with or without the extended functions and with or without DECUS NO. FOCAL8-189. Two of FOCAL's OPTIONs must be replaced with this patch. Information is included to permit the user to select which OPTIONs to trade.

Media Price Code: D1, F5

Limerick Generator; Random Sentence Generator; Life Span Simulation Program **FOCAL8-257**
Author: William Murray,
Arlington, TX
Submitted by: Sally Richards
Digital Equipment Corporation, Maynard MA
Source Language: FOCAL '69

Abstract: Three short routines demonstrating the random generation function of FOCAL 5/69 (DECUS NO. FOCAL8-52a).

Media Price Code: D2

Hearing Loss Simulator **FOCAL8-258**
Author: Thomas H. Townsend
Area of Communication Disorders, Dept. of Speech, Central Michigan University, Mt. Pleasant, MI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The "Hearing Loss Simulator" program enables the Audiology student to follow clinical testing procedures to obtain thresholds on a hearing loss simulated by the computer. The student has all the options which are available on the clinic audiometer. These include the choice of six (6) frequencies, the ear to be tested, the pure-tone presentation mode, the masking level in the non-test ear, and the hearing threshold level of the pure-tone.

Media Price Code: D2, G5

High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69 **FOCAL8-259**
Author: Jonathan Grobe
State University of New York at Stony Brook, Stony Brook, NY
Source Language: PAL-III

Abstract: Three modifications have been made to FOCAL 69. Punch is the new Type command for the high speed punch (Type operates low speed punch only; Punch operates high speed punch only). CRTL/W sets up the high speed punch for the Write command. FRAN is replaced by an improved random number generator, FRAN8 (DECUS NO. FOCAL8-150), but modified so it will also work with MODV (DECUS NO. FOCAL8-135). No user storage areas are affected, since these overlays occupy locations formerly used by FRAN, the Library command, and the Interrupt Processor.

Restrictions: This patch disables the Library Command and the Interrupt (CTRL/C) facility.

Media Price Code: D2, G5 (Includes F)

Arithmetic and Geometric Progressions **FOCAL8-260**
Author: J. Pressley,
Glen Waverly, Victoria 3150, Australia
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will find any number in an arithmetic or geometric progression and will add the first n terms of that progression.

Media Price Code: D1, G5

CHISQR: Chi Square Utility Package **FOCAL8-261**
Author: H. A. Taylor
Rutgers University, New Brunswick, NJ
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Computes X^2 for a) 1 × L frequency table, testing uniformity of frequencies; b) K × L frequency table, as a test of independence; c) 2 × 2 correlated contingency table, as a test for the significance of change or other related responses from the same individuals. For any 2 × 2 table, automatically applies Yates' correction for continuity if any expected value lies between 5 and 10; for a 2 × 2 test of independence, automatically applies Fisher's exact probabilities method if any expected value is less than 5.

Media Price Code: D1, G5

Protein Binding: PROBON 1–Fraction Bound, PROBON 2–Total Drug **FOCAL8-262**
Author: R. F. Mais, R. D. McCook, Y. T. Oester
Research Service, Hines V.A. Hospital, Hines, IL
Source Language: FOCAL '69

Abstract: The two programs "Fraction Bound" and "Total Drug" provide for the calculation of fraction drug bound or/total drug concentration for a given total drug concentration or/fraction drug bound calculated from the usual protein binding constants of number of sites N(1) and N(2) and the corresponding association constants K(1) and K(2) and the protein concentration P. The programs are written in FOCAL for the PDP-Lab 8E with 4K core. The output is fraction bound (FB) or total drug (CO), free drug concentration (C), bound drug to protein ratio (R), R to free drug ratio (R/C), and fraction of protein sites occupied (FP).

Media Price Code: D1, G5

ROOTS: A Polynomial Root Finder **FOCAL8-263**
Author: Gregory Ruth
M.I.T. Charles Stark Draper Laboratory, Cambridge, MA
Source Language: FOCAL '71

Abstract: ROOTS solves second, third and fourth order polynomial equations whose coefficients are real. It finds all real and complex roots. It calculates the roots directly, from closed form solutions, so the results (which are exact solutions, not approximations) are obtained virtually instantaneously.

Media Price Code: D2, G5

LISTAL **FOCAL8-265**
Author: Lawrence Moss,
University of Vermont, College of Medicine, Burlington, VT
Operating System: OS/8
Source Language: FOCAL '71
Memory Required: 8K
Other Software Required: PS/8 FOCAL, 1971 (See FOCAL 8-301)

Abstract: LISTAL is a PS/8 FOCAL utility program that will dramatically determine the FOCAL programs on a given device and then individually lists each program on the teletype (or line-printer if available). No operator interview is required and listing proceeds until all .FC files have been listed.

Media Price Code: D4, G5

STATPACK: An Interactive Statistical Package **FOCAL8-266**
Author: Lars Palmer
AB Hassle, Molndal 1, Sweden
Operating System: OS/8
Source Language: FOCAL '71

Abstract: STATPACK is a statistical package written in FOCAL with a main aim being to give an interactive program with a high degree of convenience for the user.
A large number of different statistical analysis are included in the program and can be reached from the keyboard with the material in core. The material has only to be entered once and is kept in core or written into a data file as requested by the user. The programs also contain accessory routines for calculating percentages and other functions of the input material and for changing, correcting and listing the material.

Media Price Code: A1, H64
Format: OS/8

Blackjack for FOCAL, 1969 **FOCAL8-267**
Author: Jeffrey Scott,
Potomac, MD
Source Language: FOCAL '69

Abstract: This program plays Blackjack with a user. The computer acts as dealer and computes all winnings and losses. After a full deck of 52 different cards is dealt by the dealer, the teletype bell rings to show that a new deck has been started. The computer usually wins, but it is not a perfect player.

Media Price Code: A3, G5

FX Function for Random Access Files **FOCAL8-268**
Author: Lawrence Moss,
Cardiopulmonary Lab., University of Vermont, Burlington, VT
Source Language: PAL-8
Memory Required: 8K
Other Software Required: OMSI PS/8 FOCAL (DECUS FOCAL8-177)

Abstract: The function FX is a random access data function for use with PS/8 FOCAL. It allows the user to build and handle data files in a random fashion, rather than in the sequential pattern which is standard with PS/8 FOCAL. The maximum array size is 2047 floating point variables, of either six or ten digit precision.

Media Price Code: D2, G8

4K FOCAL '69 SPEED-UP PATCHES **FOCAL8-269**
Author: Jim Crapuchettes
Frelan Associates, Menlo Park CA
Source Language: PAL-8
Memory Required: 4K
Other Software Required: FOCAL '69 (DEC-08-AJAE-PB)

Abstract: These changes are to a number of the internal routines for FOCAL '69, but they could be adapted to FOCAL8. In most cases, no changes to the functions of the routines have been made. These patches were developed after an extensive program of timing the execution of FOCAL.

Media Price Code: D3, H32
Format: OS/8

Monopoly **FOCAL8-270**
Author: C. C. Wilton-Davies
R.N. Physiological Laboratory, Alverstoke, Hants, UK
Operating System: OS/8
Source Language: FOCAL '71
Memory Required: 8K

Abstract: The computer acts as "Banker" in the English version of the well-known board game. Storage limitations are overcome by using eight of the programs as subroutines of the ninth, master program. Up to eight players are allowed, who may buy and sell properties with each other as well as from the bank, raise and settle mortgages, and buy houses to raise the rents on their properties. "Chance," "Community Chest" and dice throws are determined by random numbers, and jail awaits those who throw three doubles in a turn, or who are otherwise sent there.

Media Price Code: A2, G14

Modification of FOCL/F for Data Acquisition and Control **FOCAL8-271**
Author: Douglas E. Wrege
Georgia Institute of Technology, Nuclear Research Center, Atlanta, GA

Abstract: It is the aim of this paper to help the user to code specific routines in FOCAL™ so that his dialect of FOCAL can be applied to his application (without being forced to understand in detail all the workings of FOCAL). Included are descriptive discussions of how FOCAL works, the philosophy of the language, and sections technically oriented toward helping the user actually code his additions. This paper is an extention of DECUS NO. FOCAL8-17 and includes most of the discussions contained therein. The particular versions of FOCAL described will be FOCAL/69 and FOCL/F, the latter being a version of 8K FOCAL/69 with modifications by the author allowing assembler patches to be more easily added. (DECUS NO. FOCAL8-227a.)

No source available.

Media Price Code: A2

Punched Paper Tape Generator With Randomization Using FOCAL (1969) **FOCAL8-272**
Author: Derek Wakelin
Department of Psychology, King's College, Old Aberdeen, Scotland
Source Language: FOCAL '69
Memory Required: 4K

Abstract: A FOCAL version of a program containing a random rectangular distribution generator for the production of punched paper tapes for controlling experiments.

Media Price Code: D2, G5

The Phi Phenomenon **FOCAL8-273**
Author: Dr. Thomas Biddle Perera
Barnard College, Columbia University, New York, NY
Source Language: FOCAL
Memory Required: 4K
Special Hardware Required: VC8/E Display and Scope

Abstract: This program allows the display of the Phi Phenomenon; producing apparent motion from two stationary stimulus dots. It is a simple, easily modified display program using FOCAL on a PDP-8/e equipped with 4K memory, a VC8/E display controller, and a display oscilloscope. The program provides for easy modification of time, direction, and distance parameters to study their contributions to the effect.

Media Price Code: D1, G5

FOCAL 5/69 Input Buffer Patch **FOCAL8-274**
Author: Vincent E. Perriello
CAM-A-TON, Waterbury, CT
Source Language: PAL-III
Memory Required: 4K

Abstract: Patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) to enable data-tape read-in without causing input buffer overflow. The patch is compatible with the 8K (DECUS NO. FOCAL8-189) modification, and like the 8K patch, is patterned on a similar modification in FOCAL 1969.

Media Price Code: D1, F5

Teletype Histogram and Statistical Analysis of Data Set Extended and Corrected by Teletype **FOCAL8-275**
Author: Pat Walsh and Art Miller
University of Illinois Medical Center, Chicago, IL
Source Language: FOCAL '69

Abstract: Small number samples (L400) are entered by teletype with resulting teletype listing of mean, standard deviation, variance standard error and total number with histogram display. Error removal sequence allows modification of incorrectly entered input.

Media Price Code: D2, G5

The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data **FOCAL8-276**
Author: Pat Walsh and Art Miller
University of Illinois Medical Center, Chicago, IL
Source Language: FOCAL '69

Abstract: The purpose of this program is to apply a statistical measure, the Kolmogorov-Smirnov non-parametric test, to samples or data greater than 40 in number, and to suggest whether the two samples are from the same population.

Media Price Code: D2, G5

Newton Binomial **FOCAL8-277**
Author: Kevin C. Willoughby
Attleboro High School, Attleboro, MA
Source Language: FOCAL '69

Abstract: This program expands the Newton binomial $((A + B)^N)$. Although the basic routine is fairly simple, the output is rather elaborate. Instructions for use with various versions of FOCAL are included.

Media Price Code: D2, G5

A FOCAL-8 Program for Fitting the Equation $C = A(1 - e^{-Kt})$ **FOCAL8-278**
Author: Lloyd Woolner
Fisheries Radiobiological Laboratory, Lowestock, Suffolk, England
Source Language: FOCAL '69
Memory Required: 4K or 8K

Abstract: The program evaluates the values of the parameters A and K in the equation $C = A(1 - e^{-Kt})$ by an iterative method, which only requires a starting value for A. As well as calculating A and K, it produces the theoretical values for every t_i and carries out a goodness of fit test.

Media Price Code: D2, G5

MUSECL MUSI6 **FOCAL8-279**
Author: David Salzman
Belmont High School, Belmont, MA
Source Language: FOCALX, 1972
Other Software Required: DECUS No. FOCAL8-223

Abstract: This program generates measures of music in the treble clef, within the range from middle-C to G'. Selection of the notes is restricted to the twelve naturals in this area; and tones are determined from within the structure of one of several chords: C-major, F-major, or G-major. The beats are variations of 1/16, 1/8, 1/4, 1/2 and whole-notes. Each measure consists of a sequence of notes from one of the chords, in the form of one or more beats, totaling the length of the measure b/4, such that the user defines b shortly after the program begins.

Media Price Code: D2, G5

Improved Multiply Loop for FOCAL **FOCAL8-280**
Author: Jim Van Zee
University of Washington, Seattle, WA
Source Language: PAL-8
Other Software Required: FOCAL '69 (DEC-08-AJAE)

Abstract: This 34 word patch provides a 25-35% reduction in FOCAL's multiply time with a PDP-8/E, F, or M computer. Use is made of the MQ register. The patch is 8 words shorter than the original code and works with FOCAL '69 or FOCAL '71 and presumably most other versions as well.

Media Price Code: D1, G5 (Includes F)

French Language FOCAL 5/69 **FOCAL8-281**
Author: Peter J. Andes
St. Anthony's High School, Smithtown, NY
Source Language: PAL-III
Memory Required: 4K
Other Software Required: FOCAL 5/69 (DECUS No. FOCAL8-52)

Abstract: This patch is designed to convert all the commands, functions, and options of FOCAL 5/69 (DECUS NO. FOCAL8-52a) into the French language. The patch is in two parts, English to French and French to English.

Media Price Code: D2, G5 (Includes F)

CONVRT: Dollars to Deutsch Marks and Deutsch Marks to Dollars **FOCAL8-282**
Author: James R. G. Howard II and Jimmie B. Fletcher,
AIL Information Systems, APO New York, NY
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will produce a conversion chart for Dollars to Deutsch Marks and Deutsch Marks to Dollars. The initial dialog establishes the starting point and the program will then produce a conversion chart of five rates beginning at the specified starting point and ending 0.05 DM higher. The conversions are made in decade increments from $0.10 to $900.00 and from 0.10 DM to 9000.00 DM. The program could easily be modified for other currencies in a manner shown in attachment 1 to the listing. The program is also an excellent example of "FOR LOOPS" in FOCAL and the power of FOCAL in non-scientific applications.

Media Price Code: D2, G5

Improved EAE Routine for FOCAL **FOCAL8-283**
Author: James Van Zee
University of Washington, Seattle, WA
Source Language: PAL-8
Memory Required: 4K
Special Hardware Required: KE12 EAE or equivalent
Other Software Required: FOCAL '69 or FOCAL-8

Abstract: This is a greatly improved EAE patch for FOCAL which was designed for the 10 digit version, but includes a modification for the regular version as well. It makes available a total of 39 words and reduces the actual multiply time by a factor of 13-15 over the software. This is 3.5 times faster than the patch shown in the listing. In addition the results are rounded off rather than truncated so the accuracy is improved too. The coding is readily adapted to the standard Floating Point Packages. See also DECUS NO. FOCAL8-284.

Media Price Code: D2, G5 (Includes F)

8/E EAE Routine for FOCAL **FOCAL8-284**
Author: James Van Zee
University of Washington, Seattle, WA
Operating System: Paper Tape
Source Language: PAL-8
Memory Required: 4K
Special Hardware Required: KE8/E or equivalent
Other Software Required: FOCAL '69 or FOCAL-8

Abstract: This EAE patch was specifically designed for the KE8/E and uses Mode B instructions. Both 3 and 4 word versions of the multiply and divide routines are included. The normalize routine has also been rewritten. Total space available is 78 words (10 digit version). Multiply time is reduced by a factor of 18.5 (4.5 times faster than the regular EAE patch) with the results rounded off instead of being truncated. A 1-bit normalization is performed 2-3 times faster. Programmers with KE8-I or KE12 hardward should request DECUS NO. FOCAL8-283.

Media Price Code: D2, F5, G10

Online Graph–With Self Determining Scale Factor **FOCAL8-285**
Author: Robert M. Hashway,
West Warwick, RI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Will display on TTY the graph of a function of one variable. If a function is plotted over a 'wide' range and a particular area of the graph is of interest, upon input of new coordinates new scale factors will be calculated and the graph expanded over this domain to fit into a y-axis consisting of 50 spaces.
Extended functions must be retained.

Media Price Code: D1, G5

Arithmetic Practice **FOCAL8-286**
Author: R. Kenneth Walter
Webb School of California, Claremont, CA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program allows a student user to choose between operations of +, −, ×,/ integers or decimals and gives him 10 problems of the type he requests. Subsequent sets of problems are progressively easier, similar, or more difficult depending upon the student's percentage score.

Media Price Code: D1, G5

CC-FOCAL-Q **FOCAL8-287**
Author: Adrian Q. Abraham
Submitted by: A. R. D. Ramsay
Christ's College, Christchurch, New Zealand
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: TD8E DECtape
Other Software Required: FOCAL '69

Abstract: CC-FOCAL-Q enables two versions of FOCAL to be stored on DECtape. Either can be called into core from keyboard. FOCAL programs can be saved on DECtape, and called from DECtape.

Media Price Code: D2, F5

FSPACE: Space Command for FOCAL '69 **FOCAL8-288**
Author: Jonathan Grobe
State University of New York at Stony Brook, Stony Brook, NY
Source Language: PAL-III
Memory Required: 4K
Other Software Required: FOCAL '69

Abstract: A new command has been added to FOCAL 69 to output spaces. Instead of TYPE " " to output 20 spaces, one need only write X 20. A new technique is illustrated to add new commands to FOCAL—it is not necessary to give up the Library or another command.

Media Price Code: D1, G5 (Includes F)

TTY PUN: FOCAL Patch to Punch Data on Paper Tape in Format Compatible with the TTY Intercom Terminal to CDC6000 Computer Series **FOCAL8-289**
Author: Charlotte McFaul and Harold Cohn,
Naval Ship Research and Development Center, Annapolis, MD
Source Language: PAL-D
Memory Required: 4K
Other Software Required: FOCAL '69 (DEC-08-AJAE)

Abstract: This patch uses the FOCAL command, TYPE!, to punch data on paper tape in a format compatible with the TTY INTERCOM terminals of the CDC6000 computer series.

Media Price Code: D1, G5 (Includes F)

Kolmogorov-Smirnov Test for Normality **FOCAL8-290**
Author: Ernest M. Stokely
University of Texas, Southwestern Medical School, Dallas, TX
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This program tests the hypothesis that a given sample comes from a parent population having a normal distribution. The test is an alternative to the chi-squared test. 8K FOCAL is desirable because of the large program size. Data ranking, normalization, and comparison with values from the cumulative normal distribution are computed by the program.

Media Price Code: D2, G5

DRANO **FOCAL8-291**
Author: Ed Vogel
Canton High School, Canton, MA
Operating System: TSS/8
Source Language: PAL-D

Abstract: DRANO takes user's FOCAL files, one by one, most recent first, prints a file name and information, then allows user to either delete, save, or list the file. It then proceeds to the next file.

Media Price Code: D2, F8

A Laboratory and Real Time Patch With FNEW FOCAL 5/69 **FOCAL8-293**
Author: G. Schayes and L. Zandarin,
Institut d'Astronomie et de Geophysique, Louvain-la-Neuve, Belgium
Source Language: PAL-III
Memory Required: 8K
Other Software Required: FOCAL 5/69 (DECUS No. FOCAL8-52)

Abstract: Allows laboratory experiments to be connected in real time to the computer in FOCAL language. There are three main parts:
1) A FOCAL function FNEW is created having two independent features: a) it allows PDP-8/E core memories to be read (or to be written in) in FOCAL language; b) it allows to read in or to output pulses on the DR8/EA 12 channel buffered digital I/O.
2) Pulses coming on this DR8/EA interface are creating a dynamic interrupt of the inner program by executing the FOCAL group 15 instructions (equivalent to a "DO 15").
3) The KP8E Power Fail Detect option is used to save active registers as AC, LINK and PC when a power low condition is detected in order to restart the program at the interrupt point when power is restored.

Media Price Code: D2, F5, G14

Real Time FOCAL on the PDP-8 Computer **FOCAL8-294**
Author: Paul T. Brady and Judy Popelas
Bell Laboratories, Holmdel, NJ
Source Language: PAL-8
Memory Required: 8K

Abstract: Real Time FOCAL (RTF) is an adaptation of FOCAL MOD-V to allow input/output statements to be executed in the FOCAL language with millisecond timing accuracy. That is, the times at which inputs occur can be determined to within one msec, and outputs can be controlled to one msec accuracy. Also included in RTF are: (1) a statistical random number generator, (2) a computed GOTO statement, and (3) a logical AND function. RTF requires a PDP-8 with 8K memory and a real time clock and can be adapted to drive a variety of 12-bit input/output devices such as the BDIO on the PDP-8/E.
Two versions of RTF are available. The principal difference between them is that the first uses a clock and two BDIO devices that operate off of the PDP-8/E Omnibus, as well as some "standard" I/O bus devices, while the second version, written for the 8/L, performs I/O exclusively with standard I/O bus modules.

Media Price Code: D5, F12

ATTND: Monthly Attendance Reporting Module **FOCAL8-295**
Author: Robert M. Hashway
West Warwick, RI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will calculate the information required for most schools in their home room teachers' monthly reports. Also, data is

FOCAL8-295 (Cont.)

accumulated for the school state report. The information may be batched. The ASR teleprinter is used for input and output. This program can be operated on a PDP-8/E mainframe with 4K of 8 bit words, under FOCAL, 1969 with extended functions retained. Thus, most mathematics or science departments could process the reporting for their respective schools with a minimum of manpower.

Media Price Code: D1, G8

FOCALINUS: Molecular Geometry Calculator **FOCAL8-296**

Author: H. Bradford Thompson
Department of Chemistry, The University Of Toledo, Toledo, OH
Source Language: FOCAL '69
Memory Required: 8K

Abstract: FOCALINUS performs a variety of calculations based on description of the geometry of molecules in terms of internal coordinates: bond and dihedral angles and bond lengths. In addition cartesian coordinates of all the atoms, a variety of interatomic distances and angles may be derived, including three types of dihedral angles. FOCALINUS is a FOCAL derivative of the program LINUS, described in the Journal of Chemical Physics, 47, 3410 (1968).

Note: At most 33 atoms can be handled.

Media Price Code: A2, G5 (Includes F)

LUNGS: A System of Programs for the Calculation of Selected Cardiorespiratory Parameters **FOCAL8-297**

Author: Robert R. Demers A.R.I.T.
Anesthesia Research Laboratory Rhode Island Hospital, Providence, RI
Source Language: FOCAL '69
Memory Required: 8K

Abstract: The system of programs designated "LUNGS" performs calculations to aid in the diagnosis and therapy of pulmonary disorders. Among the functions performed by the programs are: correction of blood gas data from in vitro to in vivo conditions, calculations of tidal volume, respiratory rate, minute ventilation, deadspace volume, minute alveolar ventilation, oxygen uptake, respiratory exchange ratio, alveolar-arterial oxygen difference, arteriovenous oxygen difference, Fick cardiac output, cardiac index and percentage shunt. It can be applied to patients breathing spontaneously or being mechanically ventilated. One of the system programs corrects blood gas data obtained during hypothermia and extracorporeal circulation.

Media Price Code: D3, F5, G10

Critical Points of a P(x) of Degree N (Real Coefficients) **FOCAL8-298**

Author: Michael Lonergan
Submitted by: Brother John O'Connell, C.F.X.
St. John's Prep School, Danvers, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program will, in most cases, output the coordinates of all maximum, minimum and points of inflection of a P(x) of degree N. The polynomial must have real coefficients. N must be a positive integer.

Media Price Code: D1, G5

FOPAY: Weekly Payroll Deductions and Computations **FOCAL8-299**

Author: Michael H. Jacobitz,
Cougar and Hunter, Inc., Flushing, MI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program provides a practical weekly payroll computation for any number of employees, on either an hourly or a salaried basis. In addition to computing and deducting both federal and state income taxes, the program also computes the F.I.C.A. tax and provides for two additional deductions such as union dues, group insurance or a retirement fund. Upon completion of the program, running totals of deductions and weekly wages are printed, along with a total of the employer's weekly payroll liability.

Media Price Code: D1, G5

Computer Bowl **FOCAL8-300**

Author: Dolores Sochacki,
A.B. Dick, Chicago, IL
Source Language: FOCAL '69
Memory Required: 4K (without extended functions)

Abstract: The program is one in which the user participates by rating himself as to his bowling skill. The number of pins knocked down in each frame is a function of the DEC random number generator (FRAN()) and the users' bowling rating of his skill.
The number of pins per ball, strike or spare and the calculated score are all displayed on whatever terminal is available.

Media Price Code: D2, G5

U/W FOCAL **FOCAL8-301**

Author: Jim Van Zee,
University of Washington, Seattle, WA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: U/W FOCAL is an expanded version of PS/8 FOCAL (FOCAL8-177) which offers 13 new commands (including 2 unused ones), 15 more function entries (30 altogether), and many other improvements, all in the same amount of core space! Among the new features are FOCAL Statement Functions, double subscripting, variable file names, decrementing loops, the constant PI, new EAE routines for the 8/E (and older machines too), several improved functions, a command for printing the date and a way to use the teletype as a giant switch register. This version of FOCAL offers exceptional flexibility for laboratory applications as well as greatly enhanced performance for purely numerical problems. 10-digit precision (a unique feature of FOCAL) is standard.

Restrictions: 1-page I/O Handlers

Media Price Code: A4, B22, F34, H32, K27
Format: OS/8

XSTOCK: Stockmarket Simulation Game **FOCAL8-302**

Author: Alvin Yellon and Mike Benveniste,
Computonostra Programming Club, Highland Park, IL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program simulates the actual stock market as closely as possible. The user has a choice of seven stocks in which to buy or sell shares. The price of a share rises or falls randomly, using a FNEW random number function, within a range of ± 5 dollars. The brokerage

FOCAL8-302 (Cont.)

fee and stock index are calculated by following the actual exchange procedure as closely as possible. The program is also set up so that at any given time, any stock can undergo a 2 for 1 split. The output includes price, holdings, change, percent change, and any dividend paid.

Media Price Code: D2, G6 (Includes F)

STKMKT: Stock Market Game **FOCAL8-303**
Author: Philip J. Hunt,
Middletown Township High School, Middletown, NJ
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This game makes you the buyer in an imaginary stock market. You may buy or sell in a field of 10 stocks on this market. The computer keeps track of your purchases, your money on hand, and the changing stock prices.
A feature of this game is that you type in the names of your 10 stocks, 9 letters (or characters) per name.

Media Price Code: D1, G8

TIC-TAC-TOE **FOCAL8-304**
Author: William R. Murray,
Arlington, TX
Submitted by: Diane Drum
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: A short tic-tac-toe program for FOCAL 5/69 (DECUS FOCAL8-52a). Program always plays center square when given several options, otherwise picks squares at random. However, it does not play blindly and will either play to win or to block a win.

Media Price Code: D1, G5

RUBEN **FOCAL8-305**
Author: James R. B. Howard II and Jimmie B. Fletcher
AIL Information Systems, APO, NY
Source Language: FOCAL
Memory Required: 8K

Abstract: A modification of the "King of Sumeria" game. Problems with the random number generator have been corrected and some additional features have been added.

Media Price Code: D2, G8

BASEBALL **FOCAL8-306**
Author: Philip Hunt,
Middletown TWP High School, Middletown, NJ
Source Language: FOCAL '69
Memory Required: 8K

Abstract: This program lets you play a game of baseball against the computer. It has all the rules normally seen in a game of baseball, and many of the plays seen in the game including: walk, ball, strike, strike-out, foul balls, 9 types of hits, catches, 9 types of pitches, wild pitches, runners stealing, pick-off tries at any base, batter hit by patch, caught foul balls and others.

Media Price Code: D2, G10

Casino, Demos, Bombing Mission, Dougle Hangman **FOCAL8-307**
Author: Philip Hunt,
Middletown Township High School, Middletown, NJ
Source Language: FOCAL '69
Memory Required: 8K

Abstract: A group of games and demonstration programs which utilize FOCAL 5/69 (FOCAL8-52a) and its 8K overlay (FOCAL8-189).

Media Price Code: A2, G14

Fisher's F, Student's t and Chi Squared Distributions **FOCAL8-308**
Author: Thomas V. McCaffrey,
Stritch School of Medicine, Loyola University, Maywood, IL
Source Language: FOCAL '69
Memory Required: 4K

Abstract: Two FOCAL coded programs written to calculate the probability distributions of three statistical functions: Fisher's F, Student's t and Chi squared. The first program calculates both the F and t distributions. The second program calculates the Chi squared distribution.

Media Price Code: D2, G14

DBCONV: Decimal-Binary Converter **FOCAL8-309**
Author: Bob Kelley,
North Providence, RI
Source Language: FOCAL '69
Memory Required: 4K

Abstract: DBCONV is a simple program written in the FOCAL 5/69 language which will convert decimal numbers of up to 6 decimal digits to binary integers of up to 24 bits precision and up to 72 bits in length. Leading zeroes are suppressed in the output. Negative numbers are taken as their 12-bit 2's complement.

Media Price Code: D1

Overlay for KV8I–OMSI FOCAL 1971 **FOCAL8-310**
Author: Michael B. Erickson,
Virginia Polytechnic Institute and State University, Blacksburg, VA
Operating System: OS/8
Source Language: PAL-8
Special Hardware Required: KV8I/VT01 Storage Scope

Abstract: This overlay provides OMSI FOCAL 1971 with graphics display capabilities, through the functions FDIS and FJOY as described in the PS/8 FOCAL, 1971 user guide. Also character display, using the variable stroke character generator, of text is also provided. This patch requires at least 12K of memory, since it takes advantage of the fact that OMSI FOCAL only resides in 8K memory.

Media Price Code: D2, G18

CVFCPTG (Centronics Vertical Format Control Paper Tape Generator) **FOCAL8-312**
Author: W. E. Hamilton,
Sunnyvale, CA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is a FOCAL coded utility program which will produce vertical format control (carriage control) tapes for a Centronics printer.

Media Price Code: D2, G5

EAE Patches to FOCAL **FOCAL8-313**

Author: G. Chase,
Portsmouth Abbey School, Portsmouth, RI
Source Language: PAL-III
Memory Required: 4K
Other Software Required: FOCAL-8 or FOCAL 5/69

Abstract: These are Mode "B" Extended Arithmetic Element patches to two versions of the FOCAL language, namely to DEC's FOCAL-8, the revision of FOCAL, 1969, and to DECUS' FOCAL 5/69 ("Taft" FOCAL).

Mode "B" of the EAE is available only on PDP-8/E and later models. The PDP-12 and the PDP-8/I EAE run in mode "A" only. It is likely that some parts of the patches might be recodable into mode "A".

The patch to DEC's FOCAL-8 does things to the addition routines as well as to the floating multiply and divide routines. The other patch restricts itself to floating multiply and divide only. On a sample program calculating a lot of arc sines, the FOCAL-8 patch caused the program to run in about 40% less time than was required with unpatched FOCAL-8; the TAFT patch saved about 30% as compared with unpatched FOCAL 5/69.

It should be remembered that both languages are interpretive and use interpretive calls to their floating point packages. A substantial fraction of the run time of a program is determined simply by the language structure.

Media Price Code: D2, F5, G10

Y-Value Calculations **FOCAL8-314**

Author: G. Brent Dalrymple,
U.S. Geological Survey, Menlo Park, CA
Source Language: FOCAL-8
Special Hardware Required: 8K PDP-8, keyboard terminal

Abstract: This program calculates values of Y using any of eight different equations given the coefficients of the equation selected and values of X. A ninth option allows the user to enter any equation of his or her choice. The equations available are: (1) $y = a + bx$, (2) $y = a + b/x$, (3) $\ln y = a + bx$, (4) $\ln y = a + b\ln x$, (5) $y = ab^x$, (6) $y = ax^b$, (7) $y = a + be^x$, and (8) $y = a + bx + ce^{dx}$.

Media Price Code: D2, G5

YORK2: Two Error Linear Regression with Correlated Errors **FOCAL8-315**

Author: G. Brent Dalrymple,
U.S. Geological Survey, Menlo Park, CA
Source Language: FOCAL-8
Special Hardware Required: 8K PDP-8, keyboard terminal

Abstract: YORK2 is a linear regression program that allows for errors in both X and Y and also for positive and negative correlation of the X and Y errors. The program accepts errors for each value of X and Y. If the errors are uncorrelated, the correlation coefficient ($-1 \leqslant R \leqslant 1$) may be set to zero. Output consists of the slope, the intercept, the coordinates of the centroid and six statistical parameters. The program uses the "least squares cubic" method of D. York, University of Toronto (York, 1969). It requires 8K of core.

Media Price Code: D2, G5

BANCPO: Bank Portfolio Simulation **FOCAL8-316**

Author: Dr. John A. Tribble,
Newberry College, Newberry, SC
Source Language: FOCAL
Memory Required: 4K
Special Hardware Required: 4K PDP-8

Abstract: This routine simulates the decision making process of the commercial banker, a risk-filled and uncertain world where there is interdependency of bankers' decisions. General data is entered describing a banking market with five competitors. Each of the five competing banks enters a level of government securities, an initial net worth, and interest rates paid on savings accounts, paid on certificates of deposits, and charged on loans. The program calculates assets and liabilities for each bank adjusting assets to meet required reserves. The output consists of a balance sheet for the last day of the decision period and an income statement for the period.

Media Price Code: D2, G5

UFO-24: A Dynamics Simulation Game **FOCAL8-317**

Author: Robert M. Hashway,
West Warwick, RI
Source Language: FOCAL-8
Memory Required: 4K
Special Hardware Required: 4K PDP-8/E, ASR33, Low speed or high speed paper tape reader

Abstract: UFO-24 is a multiple option dynamics simulation teaching game. It is designed to increase a student experience with falling objects and pursuit trajectories. It can be used with high school or college physics courses, as a source of data for mathematics courses. It is written in FOCAL-8, and will operate with only 4K of 8-bit words with extended functions retained.

Media Price Code: D2, G5

ACTIV1: Irradiation Time Calculation for a Desired Radioisotope Activity **FOCAL8-318**

Author: Mircea Pentia,
Nuclear Educational and Training Center, Bucharest, Romania
Source Language: FOCAL '69
Special Hardware Required: PDP-8/L with teletype

Abstract: A computer program for neutrons or charged particles irradiation time determination with a view to obtaining a desired radioisotope activity to a specified moment of its use in research or industry is presented.

Media Price Code: D2, G5

FOCLAB: A Language for Computer Controlled Psychology **FOCAL8-319**

Author: Stephen L. Mullen,
Digital Equipment Corporation, Marlboro, MA
Operating System: Paper Tape or OS/8 (optional)
Source Language: PAL-8
Memory Required: 8K
Special Hardware Required: DK8-EP, DR8-EA, Teletype (or LA36 with H.S.P.T.) PDP8A, DKC8-AA

Abstract: The FOCLAB system, a dialect of FOCAL, provides complete real-time experiment control and data acquisition capabilities in the area of experimental psychology. The language provides digital and analog input/output, graphics (including alphanumerics) on a refresh CRT, and a powerful set of time measurement operations. With these facilities FOCAL may be used in cognitive, operant, as well as psychophysiological research. FOCLAB will operate with either PDP-8 or PDP-12 systems and can control most of the currently existing lab interface options for these computers. The system will operate on 8K core only machines, as well as under OS/8.

Media Price Code: A12, F24, H32

WALLIS and INTCAL **FOCAL8-320**

Author: Joe Bowbeer
Clinton High School, Clinton, Iowa
Source Language: FOCAL '69

Abstract: WALLIS is John Wallis' representation of pi as an infinite product of rationals. A fast convergence. User supplies value of last numerator.

INTCAL converges on pi using integral calculus. Convergence is slower than Wallis' convergence, but a large number of terms can be accommodated.

Media Price Code: D1

Probit Analysis **FOCAL8-321**

Author: M. W. Brinn and S. P. Simpson,
Safety in Mines Research Establishment, Sheffield, England
Source Language: FOCAL-8
Memory Required: 8K
Special Hardware Required: TTY
Other Software Required: 8K FOCAL8

Abstract: The application of probit analysis to quantal-response data (i.e. data from experiments of the "go/no go" variety) is well established and is discussed in great detail by Finney (1952). The computational procedure is straightforward but, as conventionally performed by desk calculator, very tedious and time consuming. This takes only minutes to produce a probit line equation to a predetermined accuracy by means of repeated iteration.

Media Price Code: D2, G5

VDW: Van Der Waal's Equation of State **FOCAL8-322**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: FOCAL-8
Memory Required: 4K or 8K

Abstract: This program solves the Van Der Waal's equation for gases for any of the quantities P, V, T, N. A table of constants is included; 12 gases may be used in the table in a 4K machine with extended functions deleted. The program accepts quantities and units as follows:

Quantity	*Unit*
P	ATM, BAR, PSI, KPA, MPA
V	L, CF, CC, ML, CI
T	C, F, K, R
N	GM, LBM

Internal calculations are done in liters, atm, K, GM; table constants must be in these units.

Media Price Code: D1, G5

TDES: Transformer Design **FOCAL8-323**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: FOCAL '68
Memory Required: 4K

Abstract: This program calculates the turns and wire size required for an audio transformer. The method is based on the article by Ed Francis in Popular Electronics, September 1970, page 78. Wire sizes are calculated on the basis of 800 c.m./A.

Media Price Code: D1, G5

PCOL: Pipe Column Selection **FOCAL8-324**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program selected the lightest standard pipe which will carry a given eccentric load for a given height. Schedule 40 and Schedule 80 pipes from 1 to 12 inches are included in the data table. The program returns the size and schedule of the pipe having the least area (or weight) which will give a maximum stress less than 20,000 psi.

The usual engineering judgments must be made in selecting the input data. For example, the column length must be the Euler length, which depends on the mode of support for the particular column. Care must also be taken in the selection of eccentricity values, as values near zero are unrealistic. The secant formula is used for computing the maximum stress; limitations to the use of this formula must be observed.

Media Price Code: D1, G5

FWNO: FOCAL WRITE NULLS OVERLAY **FOCAL8-325**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: PAL-III
Memory Required: 4K
Other Software Required: FOCAL '69 (DEC-08-AJAE)

Abstract: This short overlay (13 words) to FOCAL-69 modifies the WRITE command to output three nulls after every line. This produces a program tape with three frames of blank tape between program lines. As blank tape is ignored by the input routine, program tapes produced using this overlay do not require periodic stopping of the low-speed reader on input.

Media Price Code: D1

LCRU: LC Resonance with Units **FOCAL8-326**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program calculates F, L, or C from the other two known values, with units specified. Result will be converted to consistent units for output. Acceptable units are as follows:

Value	*Units*
F	HZ, KHZ, MHZ, GHZ
L	H, MH, UH, NH
C	F, UF, PF

Media Price Code: D1, G5

DEWP: Pressure Dewpoints **FOCAL8-327**

Author: Philip M. Spray,
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This program calculates the new dewpoint of air of a specified dewpoint when compressed from local atmospheric pressure to a higher pressure. The output of this program is a table of dewpoints.

Media Price Code: D1, G5

CONVM: Interconversion of Mass and Volume Units **FOCAL8-328**

Author: Barry L. Johnson, Ph.D.
National Institute for Occupational Safety and Health, Cincinnati, OH
Source Language: U/W FOCAL
Memory Required: 8K

Abstract: Program CONVM is a program written in U/W FOCAL (FOCAL8-301) for the purpose of providing quick interconversions between mass and volumetric units for gases. As an example, convert 100 parts per million of carbon monoxide to its equivalent in units of milligrams per cubic meter. CONVUM contains a library of the more common elements and permits the user to enter the chemical structure of the compound if the molecular weight is not known. By using the ideal gas law, the program computes the interconversion of units from mass to volumetric, or vice versa, over a range of values and prints the results on the teletypewriter.

Media Price Code: D1, G5

FOCAL Generates Binary Patches and Disassembles Binary Tapes **FOCAL8-329**

Author: Aldo F. Roman
Don Bosco Technical High School, Paterson, NJ
Operating System: Paper Tape
Source Language: FOCAL '69
Memory Required: 4K
Other Software Required: FOCAL 5/69

Abstract: The first part of the program is similar to DECUS NO. FOCAL8-206, with these added advantages:

a -no need of carriage return or space.
b -possibility of entering field settings
c -application of standard symbols, as * and $ used in machine language
d -avoid overflow in checksum caused by long patches
e -increased speed

In its second part it disassembles, in octal format, a binary tape, for checking purposes.

Media Price Code: D2, G5

SIMPLE: The Simplex Method to Fit Equations to Data **FOCAL8-330**

Author: G. H. Lameris
Submitted by: J. Schram
University of Technology Delft Delft, The Netherlands
Source Language: FOCAL '69
Memory Required: 4K minimum

Abstract: This program fits any equation to any set of data. Its only restriction is the amount of core required. If the extended functions are retained in 4K, there is only room for 50 variables, after the program has been loaded. The user's equation and the variables the program needs will soon exceed this amount of core. Without the extended functions the program can handle 20 pairs of data or a complicated equation.

The user has to write his equation and to load his data into core himself.

Media Price Code: D2, G5

Knight's Tour **FOCAL8-331**

Author: A. Moses,
Applied Math Co., Anthony, TX
Source Language: FOCAL-8
Memory Required: 4K

Abstract: This program prints a set of moves by a knight on a chessboard such that the knight lands on each and every square once and once only, starting from any location selected by the user.

Media Price Code: D1, G5

FOCAL 5/69 with Ancillary Programs **FOCAL8-332**

Author: Taft, Lundin, Perriello, Andes, Chase & Van Zee
Submitted by: Van Zee
University of Washington, Seattle, WA
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K

Abstract: This package contains Edward A. Taft, III's FOCAL 5/69 (DECUS FOCAL8-52a) plus the 8K overlay (FOCAL8-189) developed by Magnus Lundin and all patches known to the submitter which have been developed for this version. Each of the programs contained herein is available individually as announced in this catalog. The package is offered as a service to OS/8 users and to those installations which can access only DECtape or LINCtape.

Media Price Code: A4, B16, H32
Format: OS/8

Radioisotopes Production Problems **FOCAL8-333**

Author: Mircea Penta
Nuclear Edu & Training Ctr., Bucharest-Magurele, Romania
Source Language: FOCAL '69
Memory Required: 8K

Abstract: The neutron or charged particle irradiation time and the number of cyclical irradiations for obtaining a desired radioisotope activity, as for first as for second filiation radioisotopes was computed, using some computer programs. The flow chart of this program is presented.

Media Price Code: D2, G5

FXU12: A Machine-Code "Execute" Function Overlay to U/W-FOCAL **FOCAL8-334**

Author: Ult Weidmann
Dept of Psychology The University Leicester 7RH England
Operating System: OS/8
Source Language: PAL-8
Memory Required: 8K or 12K

Abstract: This overlay to 8K or 12K U/W-FOCAL (Vers. 3M) permits the execution of a string of up to 14 machine-codes from FOCAL by calling S Z = FX (ARG0, ARG1, ... ARG14). Its arguments must be decimal equivalents of (Octal) PDP-8/E instructions, addresses or constants. ARG0 is put into the AC before the command-string is entered, and its value on exit from the string–which is automatic–will be passed back to FOCAL.

There is no write-up but details and examples are given in the listing. FX can be called many times in a FOCAL program to set/clear enable registers, flags, test interrupts, change content of specified addresses, etc. The function is a development of that given in FOCLF (FOCAL8-227A).

Media Price Code: D1, G5

TFOCAL: A 4K Tape FOCAL **FOCAL8-335**

Author: William F. Murphy
Division of Chemistry, National Research Council, 100 Sussex Drive, Ottawa, Ontario KIA ORG, Canada
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: Tenncomp TP1351 Cartridge Unit.
Other Software Required: FOCAL '69

Abstract: A routine for using a magnetic tape cartridge system for text storage in FOCAL 1969 on a 4K PDP-8/L has been written. By making use of FOCAL internal routines and storing the basic input-output routines on the last page of memory, a minimum of free locations in FOCAL is needed.

Media Price Code: D2

UWCIG **FOCAL8-336**

Author: Ult Weidmann
The University Leicester LEI 7RH, England
Operating System: OS/8
Source Language: PAL-8
Memory Required: 12K
Special Hardware Required: VC8/E+VR14 (or TEKTRONIX-613, DR8-EA DIGITAL I/O, TD8E-DECtape
Other Software Required: 8K U/W FOCAL Ver 3M or FOCAL8-301

Abstract: UWCIG is an expansion of CHCIG8 (FOCAL8-292) modified into an overlay to 8K U/W-FOCAL ver. 3M (FOCAL8-301).

It provides interactive graphics, clock, Digital-I/O, etc. Functions for a 12K PDP8/E (LAB8/E), with VC8/E + VR14 non-storage scope, DR8-EA Digital I/O, DK8-EP Clock, TD8E DECtape, etc. Facilities exist for using a Tektronix-613 storage scope. Buffers can be quickly transferred to and from DECtape and permit the storing of 507 floating-point numbers or of 1560 integers. All of the U/W-FOCAL facilities are retained.

UWCIG should be useful in on-line work involving the presentation of dynamic displays (curves, graphs, dot-patterns) or sequences of text.

Media Price Code: D3, F9, G12

Xth Root of Y **FOCAL8-337**

Author: John Bowbeer
Clinton High School, IA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: The program XROOTY (Xth Root of Y) uses an algorithm based on an iterative process to calculate the integer roots of numbers.

Media Price Code: D1

Hybrid Operation in FOCAL for EAL580-PDP-8/e System **FOCAL8-338**

Author: T. Jeevanandam and S. S. Lamba
Indian Institute of Technology, New Delhi, India
Source Language: PAL-III
Memory Required: 8K

Abstract: HYFOC is an extended version of FOCAL-8 to operate the EAL 580/PDP 8-e system in hybrid mode. It retains all the features of FOCAL and has additional subroutines to control the 580 computer. The additional commands are: FDVM–To read and store all the addressable amplifiers of 580; thus the address selection system provides a sort of multiplexing. FPST–To change the settings of servo-set potentiometers or to provide two channel bi-directional DAC output. FSAM–To control the modes of the 580 computer. FSTR–To store large amount of data in field one to provide data logging facility. FOCAL-8 user area is undisturbed as the HYFOC overlay resides in field one.

Media Price Code: A2, G6 (Includes F)

Evaluation of Double Integrals **FOCAL8-339**

Author: Graciela O. Staffa
Instituto de Biologia Marina, Playa Grande-Mar Del Plata, Argentina
Source Language: FOCAL '68
Memory Required: 8K
Other Software Required: MODV Overlay with extended functions

Abstract: This program approximates the double integral of f(x,y) by treating it as an integrated integral and applying a two dimensional approximation.

The calculation terminates when two successive approximations reach the parameter "df" or when it has been performed a specified number of iterations.

Media Price Code: D2

Section 3
Standards

Section 3
STANDARDS

3.1 DEC Standards and other documentation related to standards such as programming conventions and guidelines, available through DECUS

DIGITAL Software Standards are software-related technical documents developed by DIGITAL. They cover items such as the format and organization of data on a tape, or how the month, day, and year should be printed on a directory listing.

DIGITAL Standards specify areas of compatibility across multiple products. In general, new products are required to conform to applicable standards, however, the applicability of any standard is subject to review in terms of the market needs of the particular product. The existence of a particular standard is NOT a commitment by DIGITAL to conform to specifications detailed in that standard.

Many software development issues are not covered by existing DIGITAL Standards, and not all existing DIGITAL Software Standards are available from DECUS. Users must make their own evaluation of whether or not these documents might be of value to them.

The following documents are available through DECUS:

DEC Standard for Basic Key Keyboard **DEC STD 107**
Submitted by: Digital Equipment Corp.
Date: 11-Jan-74

Abstract: This specification describes a DEC standard basic 60-key keyboard layout which conforms to the ANSI X4.14-1971 standard typewriter keyboard. Two additional keys are reserved for future standardization requirements. This keyboard is available as a keyswitch array only, without electronics or with electronics completely encoded. In addition, an 11-key numeric pad is offered as an accessory attachment to the main keyboard, and a 19-key array pad without electronics is available for additional capability.
These keyboard layouts are intended for use on all new equipment designs introduced into production after January 1, 1974.

Media Price Code: A2

DEC Standard for Escape Sequences **DEC STD 110**
Submitted by: Digital Equipment Corp.
Date: 1-Jul-74

Abstract: Indiscriminate echoing of ESC as (33)8 is prohibited. Where it is desirable to print some displayable character to provide visible confirmation that ESC has been received by the program, then that character must be single dollar sign ($; (44)8).
ESC is the character which initially delimits an ESC sequence and ESC may carry no other meaning, even though ESC currently has many other meanings. Applies to all new DEC terminals.

Media Price Code: A2

DEC Standard for Terminal Synchronization **DEC STD 111**
Submitted by: Digital Equipment Corp.
Date: 6-Mar-77

Abstract: DC1 and DC3, 21(8) and 23(8) formerly XON and XOFF respectively, are to be used for synchronization of terminal keyboards in the manner described in the standard, DC2 and DC4, 22(8) and 24(8) formerly TAPE and NOT-TAPE respectively, are reserved for future use, likely for synchronization as well.

Media Price Code: A2

Standard Date Format for Output **DEC STD 112**
Submitted by: Digital Equipment Corp.
Date: 10-Feb-77

Abstract: This standard ensures an unambiguous interpretation of dates by readers around the world. This format is one which is in common use throughout most of the world, is reasonably terse, is well human-engineered and is easy to produce in any computer system.

Media Price Code: A2

Standard for Indexes, Appendixes, Running Heads and Section Numbering for Software Documentation Manuals **DEC STD 118**
Submitted by: Digital Equipment Corp.
Date: 22-Jan-76

Abstract: The requirements for an index are defined. Material suitable for appendixes is described. The use of running heads for chapter-oriented manuals is specified. The acceptable levels and numbering schemes of headings' for both chapter-oriented and nonchapter-oriented software manuals are explained.

Media Price Code: A2

Cassette Format Standard for Labelled and Unlabelled Files **DEC STD 125**
Retrieval number: 005-003-016-06
Submitted by: Digital Equipment Corp.
Date: 21-Feb-77

DEC STD 125 (Cont.)

Abstract: This standard should be read by hardware and software people. It describes the format and labelling conventions for files, physical blocks, logical records and data written on Digital Equipment Corporation Cassettes. It also describes the unlabelled standard. This standard must be followed when reading and writing cassettes intended for interchange between systems; it is recommended for other cassettes.

Media Price Code: A2

Standard for Updating Hardware/Software Manuals **DEC STD 143**
Submitted by: Digital Equipment Corp.
Date: 19-Aug-76

Abstract: Document updates provide corrected, modified, or new information concerning a hardware/software product. This standard defines the format in which document updates are to be published.

Media Price Code: A2

DEC Representation of Data Values in ASCII Character Strings for Information Interchange Standard **DEC STD 145**
Submitted by: Digital Equipment Corp.
Date: 27-May-76

Abstract: This standard defines the representation of data in character strings for interchange among DEC systems. It is an extension of ANSI X3.42. American National Standard for the Representation of Numeric Values in Character Strings for Information Interchange.

Media Price Code: A2

User Mode Diagnostic Standard **DEC STD 148**
Submitted by: Digital Equipment Corp.
Date: 10-Feb-77

Abstract: This document defines general guidelines for user mode diagnostics. User mode diagnostics are tasks which run under the control of an operating system and attempt to detect and report hardware malfunctions to enable maintenance personnel to quickly complete corrective or preventive maintenance while the operating system continues to perform meaningful applications work. This standard specifies both the functions performed by the diagnostic and the operating system services required to support each of these levels of user mode diagnostics. Applies to PDP-10 and PDP-11 processor families and all future systems.

Media Price Code: A2

Punched Card Format Standard **DEC STD 151**
Submitted by: Digital Equipment Corp.
Date: 19-May-77

Abstract: This standard defines two formats for encoding data on industry-compatible 80 column tabulating cards for the purpose of ensuring that such cards may be used as a compatible means of information interchange between DIGITAL computer systems.

Media Price Code: A2

Volume Identification for Removable Disk Pack Disk Systems **DEC STD 167**
Submitted by: Digital Equipment Corp.
Date: 19-May-1977

Abstract: This standard defines the format and location of the volume identification block required to allow disk packs of removable disk-pack systems to be identified in all CPU familes. This block will enable operating systems to identify the origin and format of a volume and decide if the volume can be processed. This standard also defines a standard error message for volumes that can not be processed.

Media Price Code: A2

BASIC-PLUS Software Conventions **DECUS STD A001**
Submitted by: Martin Minow, Digital Equipment Corp.
Date: 28-Feb-77

Abstract: This specification defines the software conventions that BASIC-PLUS programs to be run under RSTS/E should follow. These conventions include coding and program documentation/commenting techniques. The conventions are intended to simplify software maintenance, to ease software release activities, to aid the software librarian, and to allow the use of standard function libraries. (This standard is part of DECUS NO. RSTS11-101.)

Media Price Code: A2

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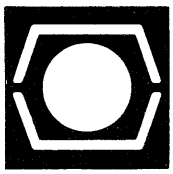

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