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.

First Edition
Updated
Updated
Updated
Updated
Updated
Updated
Combined and revised
Updated and revised
December 1973
July 1974
December 1974
May 1975
November 1975
June 1976
March 1977
August 1978

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<table>
<thead>
<tr>
<th>COMPUTER LABS</th>
<th>DECTape</th>
<th>FOCAL</th>
<th>PDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMTEX</td>
<td>DECUS</td>
<td>INDAC</td>
<td>PHA</td>
</tr>
<tr>
<td>DDT</td>
<td>DIBOL</td>
<td>LAB-8</td>
<td>RSTS</td>
</tr>
<tr>
<td>DEC</td>
<td>DIGITAL</td>
<td>MASSBUS</td>
<td>RSX</td>
</tr>
<tr>
<td>DECCOMM</td>
<td>EDUSYSTEM</td>
<td>OMNIBUS</td>
<td>TYPESET-8</td>
</tr>
<tr>
<td>DECSYSTEM-10</td>
<td>FLIP CHIP</td>
<td>OS-8</td>
<td>TYPESET-11</td>
</tr>
<tr>
<td>DECSYSTEM-20</td>
<td></td>
<td></td>
<td>UNIBUS</td>
</tr>
</tbody>
</table>
CONTENTS

Section 1 General Information

1.1 How to Use this Catalog ................................................................. v
  1.1.1 Content of Each Section ...................................................... v
  1.1.2 New and Revised Programs .................................................. v
  1.1.3 Editor's Note .................................................................... v
  1.1.4 General Catalog Information ................................................. vi
1.2 Where to Order Library Programs and Obtain Information .......... vi
  1.2.1 United States and Canada .................................................... vi
  1.2.2 Outside the United States and Canada ................................ vi
1.3 Payment .................................................................................... vii
1.4 DECUS Coupons ........................................................................ vii
1.5 Return Policy ........................................................................... vii
1.6 Documentation ........................................................................ viii
1.7 Media/Price Codes ................................................................... viii
  1.7.1 Media Codes Table .......................................................... viii
  1.7.2 User Media .................................................................... viii
  1.7.3 Service Charge Policy ....................................................... viii
1.8 Distribution Methods ................................................................ viii
  1.8.1 Program Packaging ........................................................... viii
  1.8.2 Special Library Packages ...................................................... ix
1.9 Cross-System Index ................................................................... ix

Section 2 Abstracts

2.1 PDP-8 Abstracts ........................................................................ 1
2.2 BASIC-8 Abstracts ..................................................................... 41
2.3 FOCAL-8 Abstracts ................................................................... 59

Section 3 Standards

3.1 DEC Standards Available Through DECUS ................................ 89

Section 4 Indexes

4.1 Alphabetical Index .................................................................... 91
4.2 Category Index ......................................................................... 97
4.3 Operating System Index ............................................................ 105
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 catalog 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 omitted from this issue because they were considered obsolete, had ambiguous hardware/softwarer 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 inquiries 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 additional 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 Australia and New Zealand:

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

<table>
<thead>
<tr>
<th>A</th>
<th>Write-up</th>
</tr>
</thead>
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<tr>
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<td>Listing</td>
</tr>
<tr>
<td>C</td>
<td>Microfiche</td>
</tr>
<tr>
<td>D</td>
<td>Write-up and Listing</td>
</tr>
<tr>
<td>E</td>
<td>Manuals</td>
</tr>
<tr>
<td>F</td>
<td>Binary Paper Tape</td>
</tr>
<tr>
<td>G</td>
<td>ASCII Paper Tape</td>
</tr>
<tr>
<td>H</td>
<td>DECTAPE</td>
</tr>
<tr>
<td>J</td>
<td>LINCtape</td>
</tr>
<tr>
<td>K</td>
<td>Floppy Diskette</td>
</tr>
<tr>
<td>L</td>
<td>Cassette</td>
</tr>
<tr>
<td>M</td>
<td>Magtape 600’</td>
</tr>
<tr>
<td>N</td>
<td>Magtape 1200’</td>
</tr>
<tr>
<td>P</td>
<td>Magtape 2400’</td>
</tr>
<tr>
<td>Q</td>
<td>RK05 Disk</td>
</tr>
<tr>
<td>R</td>
<td>Card Deck</td>
</tr>
</tbody>
</table>

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 encouraged to read DECUSCOPE and appropriate DECUS Newsletters to stay informed on any changes in Library policy and program availability.

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
General Information

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 FOCALS-5 through FOCALS-124, with the exception of FOCALS-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 FOCALS-126 through FOCALS-236, with the exception of FOCALS-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 0000g to 7777g. 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: A2, B2, F5, G10

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 speci­
fied, 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
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 58/S, 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

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 compatible with the current DEC Floating Point Packages.

Media Price Code: D5, F8, G34

SNAP: Simplified Numerical Analysis

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 electrical 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

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

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-8 compatible version.

Media Price Code: A2, B6, F5

Fast Fourier Transform Subroutines

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

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

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
Three Page Floating Point Package

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

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

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)

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 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
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 P5/8 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
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-8/1, 8/L, or earlier PDP-8 models.

Media Price Code: A2, B4, F5

8BALIB Macro Library Generator
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. Updates for 8-497 and 8-677 must be ordered separately.

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

Integer IOH for FORTRAN Library
Author: Ronald C. Barrett,
Northwestern University, Evanston, IL
Operating System: OS/8
Source Language: SABR
Memory Required: 1400 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 P5/8 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
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
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
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 $8 \times 9$. 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
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
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 $80 \times 80$. Missing data is permitted. Before computing correlation coefficients, the appropriate means are substituted for any missing values.
PDP-8 Abstracts

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

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 test. 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

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

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-subroutined. 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

Author: Floot 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 FS/8 input/output, can easily be adapted to other operating environments.

Restrictions: Maximum record size: 700 bytes.

Media Price Code: A2, B5, G38

N.I.H. OS/8 Package

Author: Peter Leimk
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 in 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 FORTRAN II Magtape Handler for OS/8 FORTRAN II
4. MAGDMP-An OS/8 TC58 Magtape File Storage and Retrieval System.
5. SNDFILFT, 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 Illegl 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 numerical 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. PTO8/Datapoint 3300 FS/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 Hässel, 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
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)

PIPII DOS-11 Format DECtape Utility
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: PIPII 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
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—individual or 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
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
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
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
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
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
Abstract: This FORTRAN callable subroutine performs 27 bit floating point multiplication using the 24 bit KE 8/1 or KE 8/E EAE option. Execution time has been substantially reduced in comparison with the software version included in LIB8.8L. Core space, however, has been sacrificed for this additional speed.

Restrictions: This routine is longer than the LIB8.8L 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 57A 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/B. None will run on the PDP-8/S. All programs require the KA8E peripheral. Other necessary peripherals are: NNO1 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-VIDT01 Device Handler 8-622
Author: Erik Seljak,
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

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

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

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.

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

Graphing Subroutines for 8K FORTRAN Programs

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: (Order DECUS 8-631)

Pulmonary Function Laboratory Programs

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

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

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

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

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

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, B5, F5

GEOMAS

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

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

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

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 half 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

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

Media Price Code: D2, G5
MINMON–TD8E DECtape Minimonitor

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, G5

DECSYSTEM–8

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 P8/8 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 P8/8 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 P8/8 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

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

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

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

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
CabriUlo Test Grader

Author: Don Singer,
Forest Grove Union High School, Forest Grove, OR
Submitted by: CabriUlo 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 report 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

CINET-BASIC

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

SEFDRILL: 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 DECreators and DECScopes.

Note: See also DECUS No. 8-769.

Media Price Code: A2, B10, F6, G110

Neurophysiological Data Collecting Program

8-657

Neurophysiological Data Collecting Program

Author: Fred Delcomyn,
Singer, Forest Grove 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, DKFil, 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

Media Price Code: A3, B5, F5, G40

DSKFIL: A File Structured Disk Writing Routine and Helpers

8-657B

DSKFIL: A File Structured Disk Writing Routine and Helpers

Media Price Code: A2, B2, F5, G10

TR: A Binary to ASCII Translator

8-657C

TR: A Binary to ASCII Translator

Media Price Code: A2, B2, F5, G10

Extended Double Precision Interpretive Package

8-658

Extended Double Precision Interpretive Package

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-E-S) but occupies much less core. Only two pages of memory and 15 words on page zero are required. This package performs 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
PDP-8 Abstracts

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 x 32 matrix. Births and deaths are computed according to the number of nearest neighbors.

Media Price Code: D2, G5

MINMON-TDE8 DECTape Minimonitor

Author: Ian H. Witten,
University of Essex, United Kingdom Department of Electrical Engineering Science,
Source Language: PAL-III
Memory Required: 4K
Special Hardware Required: TDE8 DECTape

Abstract: The TDE8 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

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

LOGMIX: Logic Minimization Program

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

Format: OS/8

pounds.
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 under 10 seconds.

Note: See also FOCAL8.7-2 write-up.

Media Price Code: A2, H32, K27

Format: OS/8

AMIPED: Automated Medical Interview With Pediatric Data Files

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 summarize 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

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

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

Format: OS/8

11

No source available.

Media Price Code: A2, F14
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 x 6 Latin square with each dose occurring once in each row and column. When all 36 diameters have been entered through the keyboard or one of the readers, the teletype prints the complete analysis of variance, the potency of the test preparation, expressed as a percentage of the standard preparation, the fiducial limits for P = 0.95, and the fiducial interval, expressed as a percentage of the potency.

BIOLSD is available in French or in English.

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
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)

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

Abstract: “START 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. (START PIP is not a modified PIP, but a separate program. PIP functions are NOT duplicated in START PIP).

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

Routine to Expand and Modify the DEC Floating 8-678
Point Package
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. Routines to convert 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 8½ × 11″ pages, and a report of the total amount of core used is also provided.

Media Price Code: D2, G8
DPSQRT: Double Precision Square Root for PDP-8

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

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

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

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

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: UF DSPY 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, G5

RANDU

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

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

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

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

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 form-feed.

Media Price Code: D2, G5

DECTYP: One-Word Signed Decimal Print

Author: John Briggs,
Davenport, IA
Source Language: PAL-D, PAL-III
Memory Required: 1024 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

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

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

Author: Digital Equipment Corporation,
Maynard, MA
Operating System: OS/8
Source Language: FORTRAN IV
Memory Required: 16K

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.


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

AMORT: Incremental Amortization Schedule

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
ANOVI: 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  

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 8½" × 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 8/1 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-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, 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.
The WRITE program is set up to allow an operator to place catalog information on a specified file. The catalog information includes: categories (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 categories may be searched, and all of the information under pertinent reference numbers will be printed out on the teletype.

**Media Price Code:** D2, G14

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**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

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**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

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**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

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**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

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**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-8/8 via the TTY in a manner similar to ODT. It can also display in octal form the address and contents of up to 128 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 – 76114). 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

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**MEMO IV**

*8-731*

**Author:** Gregory Ruth,  
Charles Stark Draper Laboratory, Cambridge, MA

**Operating System:** OS/8

**Source Language:** PAL-8

**Memory Required:** 34000 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

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**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-Ill
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, paper tape 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; Paper tape 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-paper tape, paper tape-to-printer and paper tape-to-paper tape 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, B6

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 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

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 of the power of multiple-DECtape systems, at the expense of some time and effort changing tapes. It insures the integrity of transfers through an error recovery system which allows retries to be ordered if the handler was unable to read a damaged tape.
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
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

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: D2, H32
Format: OS/8

CLOCK: A Real-Time Clock/Calendar Routine

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

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 analyzes,
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

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

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

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

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

Author: Stanley R. Vivian,
University of Manitoba Faculty of Medicine, Winnipeg, Mani-
toba, 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-SS-OSHBA-A-D.
Major differences are: 1) CLK—prints setting of RC clock; 2) SAM—will not sample digital registers; 3) DRI—reads contingency bits; 4) DRO—sets or clears digital outputs.

Media Price Code: A2, B3, G18

Paper Tape Display
Author: Thomas Ford
Submitted by: Jeffrey A. Merrow
Operating System: Paper Tape
Source Language: PAL-III
Memory used: 164 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
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

MIGSE2: Monitor of Interruptions Which are Generated by the PDP-8/E Peripherals
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
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
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
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
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.
FIXXCD—one-time program to fix several-known bugs in Command Decoder (PS/8 and OS/8 V1 and V2 only).
XDIRREC—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.
Super Hardware Bootstrap Code for the TC08/TC01 on an M18E 8-758
Author: Ricky Schriber/Charles Lasner
Forest Hills, NY
Source Language: PAL-8

Abstract: Due to the hardware implementation of the M18E 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 RK08 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 M18E diagnostic due to self-modification

Media Price Code: D2, F5, G5

USLIBA: FORTRAN II Subroutines for Binary 8-759
Data Transfer
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 data, 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-NEAE-A-PB) or (-08-NFPPA-APB); 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 400b 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 8-729).

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. DCBONV converts ASCII-coded decimals to binary numbers, DECPRT prints up to 4 digit decimal numbers of a binary number in AC.

HEAR is a special form of KREAD for a fix text buffer, GETKBD is the corresponding GETBUF for a fix buffer.
The routines require 2 pages of core and can be used field independent via some special routines listed in the comment. They all use the same exit (1 loc. in page 0). KREAD, TYPES, DBCONV and DECPRT are adaptations from DEC's Commonly Used Utility Routines.

Media Price Code: D2, F5, G8

**KL8TST: KL8/E, KL8/J Diagnostic**

Author: David A. Bennett  
Computer Science Research Laboratory, The Technological Institute, Evanston, IL  
Source Language: PAL-D or PAL-8  
Memory Required: 663 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**

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 PS81N subroutine (DECUS 8-472) (PS81N is included with the source).

Media Price Code: D2, F5, G12

**DUMPOS: Dumps OS/8 ASCII Files**

Author: Melvyn 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**

Author: Melvyn George Fishel  
Free University Brussels, Brussels, Belgium  
Source Language: PAL-8, PAL-III  
Memory Required: 400K words  
Special Hardware Required: EAE and VCE8 Oscilloscope.

*Abstract:* SIMBA is a fast, two-page oscilloscope character generator. A 6 x 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**

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**

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 DECS 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**

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 TUS6 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

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

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 x 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

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

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

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

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 (Xi, Yi) 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

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

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" (DECVs, 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

Author: J. S. B. Clark,
Agricultural Research Council's Poultry Research Center,
Edinburgh, Scotland
Source Language: PAL-D
Memory used: 110 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

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-View on AX08 (LAB-8) for OS/8 Editor Version III

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

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 (DECSV 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

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 DECVape)

TSS/8 FORMAT

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 DECVape)

RKCOPY

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 RK8E 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
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
Author: Jonathan Gross
University of Minnesota, Minneapolis, MN
Operating System: OS/8
Source Language: RALF
Memory Required: 133½ 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
Author: Hans-Dieter Wierum
Institut fuer Kerntechnik Technische Universität 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 matrices 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
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
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, multiply, 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
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 orthonormalisation 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
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
Author: Pei-nan Tsung, Ph.D.
Buffalo General Hospital, Buffalo, NY
Operating System: OS/8
Source Language: FORTRAN II
Memory Required: 12K
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 driven line. The Logic Products start 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: 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

*Note:* Included with 8-804 DECtape/Floppy

*Media Price Code:* G8

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Love Will Keep Us Together

*Note:* Included with 8-804 DECtape/Floppy.

*Media Price Code:* G8

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Minute Waltz

*Note:* Included on 8-804 DECtape/Floppy.

*Media Price Code:* G8

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Bach, Inventions

*Note:* Included on 8-804 DECtape/Floppy.

*Media Price Code:* G8

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PTRP.PA: RTS Handler Task for High Speed Paper Tape Reader and Punch

*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

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SACS: Simulation of an Analogue Computer

*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, homogeneous 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

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CASINO: Sykes Cassette Input/Output

*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

*Operating System:* Paper Tape

*Source Language:* PAL-I11

*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 x 256 raster scan picture files. It can display a 256 x 256 raster on a Dicomed Display with 64 levels of gray, print subpictures (up to 72 x 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 8-815
Files
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.

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 CALCOPM 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: 44k 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 x 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

31
SPASTIC IV
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
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 casting 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
Author: Peter Lemkin
National Institutes of Health Image Processing Unit Bethesda, MD
Operating System: OS/8 V3G
Source Language: FORTRAN II/SABR
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
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 x 4 matrix representation is used from standard systems (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
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
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
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 RTSS task. DDCMP permits the synchronous communication of data messages between two computer systems.

Media Price Code: A2, B4, G18

OS/8 FORTRAN-IV Routines

Abstract: This tape contains 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. FILSZ 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

Improved Mini Debugging Technique

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

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

BLKPPIP: OS/8 Transfer Program for Files and Blocks

Abstract: BLKPPIP 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. BLKPPIP 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

IPS LAV: Slave Program, and DB8E Interprocessor Buffer Handler

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

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
LIBBX: FORTRAN II EAE Library
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: LIBBX 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 iterative 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
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 User's 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
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
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 620B 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)
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 arguments 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
 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 "V3.4". 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
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
Abstract: An extremely short (120 instructions) toggled bootstrap for a Sykes 7100 disk system is presented. This bootstrap reads disk-resident code, prestores it in a 6 + 6-bit format which overwrites the toggled code and then takes over. The resident code has room for up to 860 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
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 ISNS.

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
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 the 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
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 alphanumericics 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

LPTSPI: A Lineprinter Spooler for the OS/8
"PRINT" CUSP
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: "LPTSPI" 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
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
Author: Robert W. Phelps
University of Rochester Medical Center, Rochester, N.Y.
Operating System: OS/8
Source Language: RALF
Memory used: 12008 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 FRIS 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
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
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 KV81 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:
LOGPA—the source, MULTPA—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
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
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
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 RTLST 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
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 Harverford 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 KLS-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
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 PAL 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
Rockefeller 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: 37½ 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: 40½ 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

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 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

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 operating system 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: A2, G12, H32
Format: OS/8

U, A Program To Type Out CCL Recollections

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

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

Author: Andras Nagy,
Technical University Budapest, Hungary
Operating System: OS/8 and RSTS/E
Source Language: PAL-8 and TECO
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

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

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
4K. Output is page formatted on the third pass producing a listing
with IBM compatibility 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

7250 Floppy Disk

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

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 build-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: E5, F9, H32, K54
Format: OS/8

PDP-8 Abstracts

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 FS/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
DBGUN Monitor.

Media Price Code: A5, F6, G14

OS/8 System Device Handler For Sykes 7250

Floppy Disk

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

7250 Floppy Disk

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.
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With a special secondary bootstrap format a very short toggle-in
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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

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.
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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: E5, F9, H32, K54
Format: OS/8
Section 2.2
BASIC8 ABSTRACTS

MATHEMATICS--SET 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 $\pi$ 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
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.
P12--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 roots of the quadratic equation $ax^2 + bx + c = 0$.
SETS--Finds the union and intersection of any two numerical sets.
SIMEQN--Finds solutions to sets of up to ten simultaneous equations.
SLOPE--Computes the tangent slope for any function.
SORT--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
Submitted by: F. McPhetres

ROUNDOFF--Rounds off numbers to any number of places.
SETS--CAMP, First Course

TUTOR--Walter Koetke

Drill and practice with time-speed-distance.

AREA--Computer Methods in Mathematics

Solves for the area under a curve by equation.

FLIP--Basic BASIC

Uses random number generator in BASIC to flip a coin.

EXPON--NREL/SDC

Solves for the 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 $N$.

WALKI--Bill Walker

A generalized plotting routine which prints a graph of an expression given in terms of $x$.

GAUSS--Philip Sorgen

Uses the Gauss-Jordan Elimination Method to solve $N$ linear equations in $N$ unknowns simultaneously.

ABSVAL--DYMAX

A series of seven programs which compute and print the absolute value of $X$.

ME EPSILON YOU DELTA--Roger Kerchner

A game designed to help in understanding the limit concept.

SINPLOT--Dennis Lunder
Plots and prints a graph of the sine for function from 0-360 degrees.

GOLDBACH-CAMP, First Course
Provides new ways to approach theorem proving using Goldbach's Conjecture.

LINEAR–Frederick Brink
Finds the point where linear systems in 2 or 3 variables intersect.

Media Price Code: D3

PLOTTING–SET 1
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 2
Submitted by: Polytechnic Institute of Brooklyn
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
Submitted by: Polytechnic Institute of Brooklyn
ATWT–Calculates atomic weight from percent abundance of isotopes.
AVOGA–Calculates Avogadro's number.

Media Price Code: D3
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 H₂ + I₂ and PCl₅ PCl₃ + Cl₂.

KINET—Tabulates and graphs equilibrium concentration data.

MASSD—Calculates mass defect.

MOLAR—Calculates molarity from titration data.

PHTO—Calculates pH, pOH and percent dissociation.

PRCNT—Calculates percent composition.

STOICH—Solves mass/mass, mass/volume, and volume/volume problems.

CHEMISTRY—SET 2

GASVOL—NREL/SDC/DEC Calculates and plots gas volumes at various pressures.

Media Price Code: D1

BIOLG—SET 1

Submitted by: Polytechnic Institute of Brooklyn

EOLU/SPRLIFIED VERSION—Demonstrates evolutionary mutations of pepper moths.

EOLU—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.

GAMBN—Review of gametogenesis using diagrams and questions.

MEMBR—Experiment simulation showing the active and passive transport of materials across a membrane.

NZYM—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

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

Submitted by: Gruenberger and Jaffray

POPULC—Examines 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.

CIRF—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

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)

STATCAL—Calculates the arithmetic mean (average) of a set of numbers.

Media Price Code: D2

COMPUTER WORKSHOP

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 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--Ruth's general solution of the quartic is in DECUS NO. 263. This program handles only cubics and quadratics, but allows for possible upward expansion by the user.

FRCACD--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.

REPETER--A string of up to 6 digits, specified as repeating (9.0 repeating means 9.090909 ...) 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 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 expressible as a linear combination.

SIEVE--Demonstrates the sieve method of finding primes.

FRQRS--Writes positive integers as the sum of 4 squares.

INSCR--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 Submitted by: Harold L. Singer

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--Rises 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

Football Scouting Report Systems 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-1—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 Ingenious 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 Edu-system-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, (or 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. EQUATION—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. RAOUULT—Practice in solving problems which deal with the concentration of a solution and its freezing point, and the determination of molecular weight.

IX. GASLAW—Relationship between the moles and grams of a solute and the volume and molarity of the solution.


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
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

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
Submitted by: G. Chase

Abstract: TAPE “A”
1. “LARG2,” add or multiply 2 extended-precision integers. A subset of H-P’s “(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.
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. “DECI0,” extended-precision decimal integer converted to its extended precision octal equivalent.
7. “DECF0,” single precision A/B fraction *OR* extended-precision 0.12345 ... String converted into extended-precision octal string.
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 HORSE RACING PROGRAM
Submitted by: Ed Vogel
Operating System: 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 EDU system 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

Submitted by: David Dodell
Operating System: 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
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
Submitted by: Kent Springer
Operating System: 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 Fahrenheit, 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
Submitted by: “PK” Kretzman, George Roukis

Abstract: CSHHS BASIC-73 is a language patterned after, and in fact, consisting of numerous modifications to DECUS POLY BASIC. Extensive rebuilding of both the compiler and editing sections
have given the language enormous scope and increased power. Never­theless, almost complete upward compatibility 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 EDU-system-20 on the 4K Disk Monitor System**
Submitted by: Jeff Nisler
Operating System: 4K Disk Monitor System
Source Language: PAL-III

Abstract: This program enables the user to load and save EDU-system 20 on the 4K disk/DECtape monitor system.

Media Price Code: D1, G5 (Includes F)

**POSTER, SIGNS**
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**
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 Acey-deucey 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 program is intentionally unbeatable. Playing a program that cannot be beaten is very boring. It is not easy to beat the machine, but it can be beaten.

This game runs on a PDP-8/L running a standard Edusystem-20, with a three-user configuration.

3. CHECK6C plays a fair game of checkers against a human opponent. The program will play at the level of a very good amateur. It is usually beaten by a quality opponent, but fares very well against novices and other programs. Full directions are included in the write-up.

CHECK6C runs on an 8K PDP-8/L running Edusystem-20 with a three-user configuration.

4. ONEARM, written in Edusystem-20 BASIC, simulates playing a slot machine. The program allows variable payoff odds, six different fruits (double payoff if you get three boysenberries), and allows the player to carry his winnings or loses from one game to the next, should he care to. The bank breaks at 1000 dollars, and the player is broken at 1000 dollars lost.

The program will run on an 8K PDP-8/L with a three-user configuration.

Media Price Code: D2, G8

**NYLISIS, POSTER2, CLNDR5, PIDART**
Submitted by: Edward J. Quigley
Operating System: EDU-20

1. NYLISIS 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.

NYLISIS 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 calendar 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**

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 BASIC-55.4 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

**ACEDUC, TICTACTOE, CHECK6C**

Media Price Code: G5

**AMAZING**

Memory Required: 12K

Media Price Code: G5

**ANIMAL**

Memory Required: 12K

Media Price Code: G5

**AWARI**

Media Price Code: G5
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**Media Price Code:**
- G5
- G8
- G10

**Memory Required:**
- 12K
- 16K
Laboratory and Display Instructions for OS/8 BASIC
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 VCE 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)
Author: Howard Wolfington
Submitted 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

Bowling League Tabulator
Submitted by: Philip Bujalski
Operating System: OS/8

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
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
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
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
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
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
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
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
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
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: D1, G5

CALC
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
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
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
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, G5

SINCOS: SIN and COS Functions Graphing
Program
Submitted by: Geoffrey Mandel
Source Language: BASIC

Abstract: SINCOS allows the user to select the vertical limit of the \( \theta \) (Theta) axis, in either real numbers or multiples of \( \pi \). 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 \( \theta \) and \( F(\theta) \) axes is approximately equal. Multiples of \( \pi \) are indicated along the vertical axis.

Restrictions: SIN, COS and specialized use of TAB function necessary to run program.

Media Price Code: D1, G5

GAMES, Set 4
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
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
Submitted by: Steven Rabin
Source Language: BASIC

Abstract: This racing game simulates a 3,000 unit racetrack on a BASIC system with the backslash or: statements and string variables. It requires 7 blocks.

Media Price Code: D2, G5

MIS1, MIS2
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
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
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
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
PLTPEG: Mathematical TTY Plotting Package
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
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
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 defense 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
Author: B. D. Fleish, J. A. Zec, R. E. Salz, E. Fisher

BASIC-86.1 PLBUNY—Prints a facsimile of the Playboy bunny.
BASIC-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.
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 keystrokes 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
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
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, SCRMLBL 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
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 $15 \times 15$ 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
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
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
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 complete execution by printing a deviation table. The program runs in 8K of core.

Media Price Code: D2, G5

Bowling Record Tabulator
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
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
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
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
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
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
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
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
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 discussion of how FOCAL works, in a descriptive fashion. Section III is concerned with the philosophy of the language, and the last few sections are technically oriented toward helping the user actually code his additions. Several examples and ready-coded routines, which may be used to simplify the user’s problems, are included.

An extension of this document is offered as DECUS NO. FOCAL-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
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
\[ Y = A \times \text{EXP}(\alpha X) \]
to the user’s data.

Media Price Code: A2, G5

MULTIPULSE
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
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, \[ Y = A \times \text{EXP}(X) \]; 2) Power Curve \[ Y = AX^N \]; 3) Linear Line \[ Y = MX + B \].

Media Price Code: D1, G5

Simple Chi-Square Test
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: \( O = \text{XXX.xxx} \) and \( E = \text{XXX.xxx} \). 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

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

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

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

Author: Richard May, Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69

Abstract: This routine is the solution and graphical output of the function:

\[ M(a, x) = \frac{4}{\pi} \sum_{n=0}^{\infty} (-1)^n \frac{e^{-(N^2 + 1)} \cdot \left(2a \right)^2}{2} \]

as \( \frac{2a}{x} \) varies from 0 to 1.

Media Price Code: D1, G5

FOCAL Version of RC Active Filter

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 FOCAL-175)

Media Price Code: D2, G5

FOCAL 5/69

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

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

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
FOCAL8 Abstracts

A System for Production of Problem Sets with Individualized Data
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
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 Xj(obs), Yj(obs) (j = 1 ··· L1) this program finds the coefficients B, expression:

\[ Y_j \text{ (calc)} = \sum_{j=1}^{L} B_j X_j^{j-1} \text{ (obs)} \]

with \( L = NA \cdot 'NB \)

\( j = 1 \cdot \cdot \cdot L1 \)

Media Price Code: D2, G5

CURFIT
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
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 polynomial, \( f(x) \), 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
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
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 "Scheffe’s Contrast Between Means" (FOCAL-16), and is designed to be used in conjunction with FOCAL-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
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
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
Author: Jerry D. Burns,
Exotic Environments Laboratory, Arizona State University, Tempe, AZ
Source Language: FOCAL '68
Memory Required: 4K

FOCAL8-60—FOCAL8-69
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

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

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

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

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
FOCAL Lunar Landing Simulation (APOLLO)  

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  

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  

Author: Thomas J. Ford,  
White Mountains Regional High School, Whitefield, NH  
Source Language: FOCAL '69  


Media Price Code: D2, G10

2D Plotter for Serial Experimental Data  

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  

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.
Horserace  
**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  
**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  
**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  
**Author:** R. Bradford Malt,  
Wellesley High School, Wellesley, MA  
**Source Language:** FOCAL '69  
**Memory Required:** 4K  

**Abstract:** This program graphs up to 9 equations simultaneously on an ASR33 or similar teletype. It requires only one type head 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)  
**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 3×3×3 cube have been filled. Game rules and operating instructions accompany this program.  

**Media Price Code:** D1, G10

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Solution of Quadratic Equations with Complex Coefficients  
**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  
**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  
**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

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:
\[ i(y, t) = A e^{\lambda y} \sin(\omega t - k y) - j \omega \lambda A e^{\lambda y} \cos(\omega t - k y) \]

In this equation, angular frequency \( \omega = 10 \), \( \lambda \) radians per second, and propagation constant \( k \) for positive or negative values for a reflected wave. Phase constant \( \beta \) 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 \( \pi \) 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 lie in the sketch space.

Media Price Code: D2, G5

NIM

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

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

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)

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)

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

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

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:

<table>
<thead>
<tr>
<th>SAMPLE No.</th>
<th>TIME</th>
<th>COUNTS A</th>
<th>COUNTS B</th>
<th>COUNTS SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN</td>
<td>T</td>
<td>CA</td>
<td>CB</td>
<td>CS</td>
</tr>
</tbody>
</table>

Media Price Code: D2, G5

Short Programs for Statistical Analysis Using FOCAL

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 Y Analysis; 4) 2 x 2 Chi-squared analysis together with an open ended Chi-squared program for testing
FOCAL8 Abstracts

FOCAL8-115 (Cont.)

goodness of fit: 5) Least squares correlation program together with a Spearman-rho correlation by rank; 6) Analysis of 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

Author: Lars Palmer,
AB Hässele, 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:

\[ Y = \frac{A}{1 + B/X} \]

i.e. the dose-response curve.

Media Price Code: D2, G5

FOCAL8-117

Three Mathematical Routines: Powers, Complex Roots, Cube Roots

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 rather than the trigonometric form.
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

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

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

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

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

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

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
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
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
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
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
Author: R. W. Carter and Friedrich A. Graepe,
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 produces highly accurate results.

Media Price Code: D1, G5

1-20 Counting Game
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
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
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
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
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
FOCAL8-143—FOCAL8-161

FOCAL8-142 (Cont.)

Abstract:
Repeated Matrix Multiplication

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 $3 \times 3$ matrix, the new matrix may be of order $12 \times 3$ etc.

Media Price Code: D2, G5

Zeller's Congruence/Day of the Week

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

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

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 $17 \times 17$ of real numbers using modified Gauss-Jordan methods. It is translated from DECUS NO. 8-72.

Media Price Code: D2, G5

FACTORS

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

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

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

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

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  
**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)

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

Erlang C Blocking Probability Programs  
**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  
**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 $F = (X_1^2/V_1)/(X_2^2/V_2)$ 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  
**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. 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

Saint Peter's College Statistical Package  
**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:  
FOCAL-170.1 FLGPLT—Plots scaled frequency distributions  
FOCAL-170.2 FLBIND—Plots binomial probability Distributions  
FOCAL-170.3 FLPCTL—Computes percentile scores  
FOCAL-170.4 FLSDEV—Computes means and related measures  
FOCAL-170.5 FLHMES—Computes "H," the information measure of noise  
FOCAL-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, G18

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 any 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 t 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 FOCAL8-175
RC Active Filter Design and Plot and 3-Pole Butterworth Filters
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 Scoring 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

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

Manpower

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

FOCAL-SORT

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

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

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
All Purpose Graphing Program

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

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

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, G5

Michaelis-Menten Kinetics

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

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
Acid-Base Equilibria

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 pHa based on a variety of inputs.

Media Price Code: D1, G5

Random Walk/Array

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

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

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

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

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

Author: L. L. Alber and M. W. Overton,
U.S. Food and Drug Administration, Chicago, IL
Source Language: FOCAL '68
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

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

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

Author: Bob Cronin,
Belmont Hill School, Belmont, MA
Source Language: PAL-III
Memory Required: 8K
FOCAL8 Abstracts

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, FOCUS8-224
Scalar and Timer, by Internal Counting

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 PDF-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

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

Author: Klaus Lickteig,
Institut Fuer Kerntechnik, Technische Universitaet Berlin, Berlin, Germany

Source Language: FOCAL '69 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 FOCUS8-227

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: FOCCL/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. FOCCL/F version 12/1/72 is closely compatible with FOCAL-10, the newly released implementation of FOCCL/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

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

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

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

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 x 10^-10. The routine occupies slightly less memory than the original.

Media Price Code: D2, G5 (Includes F)

Roots by Inverse Interpolation

Author: H. Bradford Thompson,
University of Toledo, Toledo, OH
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This subprogram uses a modified inverse interpolation (regular 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

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

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)

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

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

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

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

Author: Stephen A. Kallis, Jr.,
Digital Equipment Corporation, Maynard, MA
Source Language: FOCAL '69
Memory Required: 4K

Abstract: This is a short, multiple choice literary quiz designed expressly for science-fiction readers.

Media Price Code: D1, G5

Satellite Orbital Parameters

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
Author: K. Wagner, Technische Universität 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
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
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
Author: Robert Cronin, Belmont Hill School, Belmont, MA
Source Language: FOCLX, 1972
Memory Required: 8K
Other Software Required: DECUS No. FOCLX-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
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

Payroll Listings and Totals
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
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. \[ Y = A + B \times X \]
2. \[ Y = A + B + C \times X \]
3. \[ Y = A + B + C + D \times X \]
4. \[ Y = A + B + C + D + E \times X \]
5. \[ Y = 1/(A + B + C) \]
6. \[ Y = X/(B + C + D) \]

There is no input limit for the total number of observations.

Media Price Code: D1, G5

"WORD": Character Generation Using FOCAL’s FDIS Function
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
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  

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 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  

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 evaluable 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  

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 $  

Author: Horace D. Stephens,  
Waynflete School, Portland, ME  
Source Language: PAL-Ill  
Memory Required: 4K

Abstract: This patch to FOCAL 5/69 (DECUS NO. FOCAL8-52a) enables two OPTIONS, OPTION $ and OPTION F. OPTION $ makes $ a legal variable identifier and makes $ the function label. (FSQT(4) becomes SSQT(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  

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  

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  

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). CTRL/W sets up the high speed punch for the Write command. FRAN is replaced by an improved random number generator, FRAN8 (DECUS NO. FOCAL-150), but modified so it will also work with MODV (DECUS NO. FOCAL-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  

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  
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  
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  
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  
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  
Author: Lars Palmer  
AB Hasle, 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  
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  
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 FOCAL-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  
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
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
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 FOCL™ so that his dialect of FOCL can be applied to his application (without being forced to understand in detail all the workings of FOCL). Included are descriptive discussions of how FOCL works, the philosophy of the language, and sections technically oriented toward helping the user actually code his additions. This paper is an extension of DECUS NO. FOCL-17 and includes most of the discussions contained therein. The particular versions of FOCL described will be FOCL/69 and FOCL/F, the latter being a version of 8K FOCL/69 with modifications by the author allowing assembler patches to be more easily added. (DECUS NO. FOCL-227a.)

No source available.

Media Price Code: A2

Punched Paper Tape Generator With Randomization Using FOCL (1969)
Author: Derek Wakelin
Department of Psychology, King's College, Old Aberdeen, Scotland

Abstract: A FOCL 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
Author: Dr. Thomas Biddle Perera
Barnard College, Columbia University, New York, NY

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 FOCL 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
Author: Vincent E. Perriello
CAM-A-TON, Waterbury, CT

Abstract: Patch to FOCAL 5/69 (DECUS NO. FOCL-52a) to enable data-tape read-in without causing input buffer overflow. The patch is compatible with the 8K (DECUS NO. FOCL-189) modification, and like the 8K patch, is patterned on a similar modification in FOCAL 1969.

Media Price Code: D1, F5

The Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data
Author: Pat Walsh and Art Miller
University of Illinois Medical Center, Chicago, IL

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
Author: Kevin C. Willoughby
Attleboro High School, Attleboro, MA

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 FOCL are included.

Media Price Code: D2, G5

A FOCAL-8 Program for Fitting the Equation
\[ C = A(1 - e^{-Kt}) \]
Author: Lloyd Woolner
Fisheries Radiobiological Laboratory, Lowestoft, Suffolk, England

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
<table>
<thead>
<tr>
<th><strong>MUSECL MUSI6</strong></th>
<th><strong>FOCAL-279</strong></th>
</tr>
</thead>
</table>
| **Author:** David Salzman  
Belmont High School, Belmont, MA | **Source Language:** FOCALX, 1972  
**Other Software Required:** DECUS No. FOCAL-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 |

<table>
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<tr>
<th><strong>Improved Multiply Loop for FOCAL</strong></th>
<th><strong>FOCAL-280</strong></th>
</tr>
</thead>
</table>
| **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) |

<table>
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<tr>
<th><strong>French Language FOCAL 5/69</strong></th>
<th><strong>FOCAL-281</strong></th>
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</table>
| **Author:** Peter J. Andes  
St. Anthony's High School, Smithtown, NY | **Source Language:** PAL-III  
**Other Software Required:** FOCAL 5/69 (DECUS No. FOCAL-52) |
| **Abstract:** This patch is designed to convert all the commands, functions, and options of FOCAL 5/69 (DECUS NO. FOCAL-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) |

<table>
<thead>
<tr>
<th><strong>CONVRT:</strong> Dollars to Deutsch Marks and Deutsch Marks to Dollars</th>
<th><strong>FOCAL-282</strong></th>
</tr>
</thead>
</table>
| **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 |

<table>
<thead>
<tr>
<th><strong>Improved EAE Routine for FOCAL</strong></th>
<th><strong>FOCAL-283</strong></th>
</tr>
</thead>
</table>
| **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. FOCAL-284. | **Media Price Code:** D2, G5 (Includes F) |

<table>
<thead>
<tr>
<th><strong>8/E EAE Routine for FOCAL</strong></th>
<th><strong>FOCAL-284</strong></th>
</tr>
</thead>
</table>
| **Author:** James Van Zee  
University of Washington, Seattle, WA | **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 hardware should request DECUS NO. FOCAL-283. | **Media Price Code:** D2, F5, G10 |

<table>
<thead>
<tr>
<th><strong>Online Graph- With Self Determining Scale Factor</strong></th>
<th><strong>FOCAL-285</strong></th>
</tr>
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</table>
| **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 |

<table>
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<tr>
<th><strong>Arithmetic Practice</strong></th>
<th><strong>FOCAL-286</strong></th>
</tr>
</thead>
</table>
| **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

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

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

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 (DECUS No. FOCAL-82)

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

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

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

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. FOCAL-82)

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

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

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

FOCAL8-296

FOCALINUS: Molecular Geometry Calculator

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)

FOCAL8-297

LUNGS: A System of Programs for the Calculation of Selected Cardiorespiratory Parameters

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)

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

FOCAL8-299

FOPAY: Weekly Payroll Deductions and Computations

Author: Michael H. Jacobitz,
Cougur 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

FOCAL8-300

Computer Bowl

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 (FRANO) 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: A2, G5

FOCAL8-301

U/W FOCAL

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 (FOCAL-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

FOCAL8-302

XSTOCK: Stockmarket Simulation Game

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
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.

STKMKT: Stock Market Game

STKMKT: Stock Market Game

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

TIC-TAC-TOE

Abstract: A short tic-tac-toe program for FOCUS 5/69 (DECUS FOCAL-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

RUBEN

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

BASEBALL

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 pitch, caught foul balls and others.

Media Price Code: D2, G10

Casino, Demos, Bombing Mission, Dougle

Hangman

Fisher’s F, Student’s t and Chi Squared Distributions

DBCONV: Decimal-Binary Converter

Overlay for KV8I-OMSI FOCUS 1971

CVFCTP (Centronics Vertical Format Control Paper Tape Generator)
EAE Patches to FOCAL

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-8/1 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 arcs 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 unpached 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

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 choice. The equations available are:

1. \( y = a + bx \),
2. \( y = a + bx + cx \),
3. \( y = a + bx + cx + dx \),
4. \( y = a + bx + c \),
5. \( y = a + bx + c \),
6. \( y = a + bx + c \),
7. \( y = a + bx + c \),
8. \( y = a + bx + c \).

Media Price Code: D2, G5

YORK2: Two Error Linear Regression with Correlated Errors

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 (\( -1 < R < 1 \)) 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

BANCPPO: Bank Portfolio Simulation

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: A12, F24, H32

FOCAL8-313—FOCAL8-319
**WALLIS and INTOCAL**

**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. INTOCAL 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

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**Probit Analysis**

**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

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**VDW: Van Der Waal's Equation of State**

**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:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>ATM, BAR, PSI, KPA, MPA</td>
</tr>
<tr>
<td>V</td>
<td>L, CF, CC, ML, CI</td>
</tr>
<tr>
<td>T</td>
<td>C, F, K, R</td>
</tr>
<tr>
<td>N</td>
<td>GM, LBM</td>
</tr>
</tbody>
</table>

Internal calculations are done in liters, atm, K, GM; table constants must be in these units.

**Media Price Code:** D1, G5

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**TDES: Transformer Design**

**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

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**PCOL: Pipe Column Selection**

**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

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. CONVM 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

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

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

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

Radioisotopes Production Problems

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

Author: Ulf 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 $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 FOCFLP (FOCAL8-227A).

Media Price Code: D1, G5
FOCAL8 Abstracts

TFOCAL: A 4K Tape FOCAL
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-S/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: D1

UWCIG
Author: Uli Weidmann
The University Leicester LEI 7RH, England
Operating System: OS/S
Source Language: PAL-S
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 FOCAL-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: D2, G6 (Includes F)

Xth Root of Y
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
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
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:

<table>
<thead>
<tr>
<th>DEC Standard for Basic Key Keyboard</th>
<th>DEC STD 107</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 11-Jan-74</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract:</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Media Price Code:</strong></td>
<td>A2</td>
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<table>
<thead>
<tr>
<th>DEC Standard for Escape Sequences</th>
<th>DEC STD 110</th>
</tr>
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<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 1-Jul-74</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract:</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Media Price Code:</strong></td>
<td>A2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEC Standard for Terminal Synchronization</th>
<th>DEC STD 111</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 6-Mar-77</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract:</strong></td>
<td>DC1 and DC3, 21(8) and 22(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.</td>
</tr>
<tr>
<td><strong>Media Price Code:</strong></td>
<td>A2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Date Format for Output</th>
<th>DEC STD 112</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 10-Feb-77</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract:</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Media Price Code:</strong></td>
<td>A2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard for Indexes, Appendixes, Running Heads and Section Numbering for Software Documentation Manuals</th>
<th>DEC STD 118</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 22-Jan-76</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract:</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Media Price Code:</strong></td>
<td>A2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cassette Format Standard for Labelled and Unlabelled Files</th>
<th>DEC STD 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted by: Digital Equipment Corp.</td>
<td></td>
</tr>
<tr>
<td>Date: 21-Feb-77</td>
<td></td>
</tr>
<tr>
<td><strong>Retrieval number:</strong></td>
<td>005-003-016-06</td>
</tr>
</tbody>
</table>

89
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

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

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

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

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

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 families. 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

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
Section 4
Indexes
### Section 4.1

**ALPHABETICAL INDEX**

<table>
<thead>
<tr>
<th>Alphabetical Order</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CHECK</td>
<td>BASIC8-55.71</td>
</tr>
<tr>
<td>1-20 Counting Game</td>
<td>BASIC8-55.101</td>
</tr>
<tr>
<td>23MTCH</td>
<td>FOCAL8-134</td>
</tr>
<tr>
<td>2D Plotter for Serial Experimental Data</td>
<td>FOCAL8-84</td>
</tr>
<tr>
<td>3 Dimensional TIC TAC TOE (3x3x3)</td>
<td>FOCAL8-99</td>
</tr>
<tr>
<td>3DPLST</td>
<td>BASIC8-55.96</td>
</tr>
<tr>
<td>4K FOCAL '69 SPEED-UP PATCHES</td>
<td>FOCAL8-269</td>
</tr>
<tr>
<td>8/E EAE Routine for FOCAL</td>
<td>FOCAL8-284</td>
</tr>
<tr>
<td>8BAL PDP-8 Macro Language, Version 4</td>
<td>8-497</td>
</tr>
<tr>
<td>8BALIB Macro Library Generator</td>
<td>8-530</td>
</tr>
<tr>
<td>ACEDUC, TICTACTOE, CHECK6C, ONEARM</td>
<td>BASIC8-53</td>
</tr>
<tr>
<td>ACEDU</td>
<td>BASIC8-55.1</td>
</tr>
<tr>
<td>ACID DU</td>
<td>FOCAL8-204</td>
</tr>
<tr>
<td>Acid-Base Equilibria</td>
<td>FOCAL8-113</td>
</tr>
<tr>
<td>Acid-Base Titration Curves</td>
<td>FOCAL8-234</td>
</tr>
<tr>
<td>Action Indicator Calculator</td>
<td>FOCAL8-318</td>
</tr>
<tr>
<td>ADDUM</td>
<td>8-605</td>
</tr>
<tr>
<td>ADLGOL (4K Version)</td>
<td>8-213</td>
</tr>
<tr>
<td>All Purpose Graphing Program</td>
<td>FOCAL8-195</td>
</tr>
<tr>
<td>ALPHA.SV: Sort OS/8 Directories</td>
<td>8-825</td>
</tr>
<tr>
<td>AMAZIN</td>
<td>BASIC8-55.2</td>
</tr>
<tr>
<td>AMIPED-Automated Medical Interview With Pediatric Data Files</td>
<td>8-650</td>
</tr>
<tr>
<td>AMORT: Incremental Amortization Schedule</td>
<td>8-703</td>
</tr>
<tr>
<td>Analysis of Variance for One-Two- and Three-Treatment Designs for a PDP-8</td>
<td>FOCAL8-243</td>
</tr>
<tr>
<td>Analysis of Variance for Two-Dimensional Material</td>
<td>FOCAL8-108</td>
</tr>
<tr>
<td>Analysis of Variance Package</td>
<td>FOCAL8-124</td>
</tr>
<tr>
<td>Analysis of Variance Randomized Block “F” Test</td>
<td>FOCAL8-70</td>
</tr>
<tr>
<td>Analysis of Variance</td>
<td>FOCAL8-99</td>
</tr>
<tr>
<td>ANIMAL</td>
<td>BASIC8-55.3</td>
</tr>
<tr>
<td>ANOVA1: Analysis of Variance, Unequal N</td>
<td>8-705</td>
</tr>
<tr>
<td>ANOVA and DUNCAN</td>
<td>8-554</td>
</tr>
<tr>
<td>ANOVA, 2-way, Unsymmetrical</td>
<td>FOCAL8-193</td>
</tr>
<tr>
<td>APOLLO II</td>
<td>FOCAL8-173</td>
</tr>
<tr>
<td>Arithmetic and Geometric Progressions</td>
<td>FOCAL8-260</td>
</tr>
<tr>
<td>Arithmetic Practice</td>
<td>FOCAL8-286</td>
</tr>
<tr>
<td>ARNORM: Area Under Normal Curve</td>
<td>8-705</td>
</tr>
<tr>
<td>ASCON-ASCII File Converter</td>
<td>FOCAL8-88</td>
</tr>
<tr>
<td>Atomic and Molecular Transition Probabilities in FOCAL</td>
<td>FOCAL8-295</td>
</tr>
<tr>
<td>ATTND—Monthly Attendance Reporting Module</td>
<td>8-626</td>
</tr>
<tr>
<td>Automated Electrooculography</td>
<td>BASIC8-55.4</td>
</tr>
<tr>
<td>AWARI</td>
<td>8-804.4</td>
</tr>
<tr>
<td>Bach, Inventions</td>
<td>BASIC8-55.5</td>
</tr>
<tr>
<td>BAGLES</td>
<td>BASIC8-316</td>
</tr>
<tr>
<td>BANCOPO-Bank Portfolio Simulation</td>
<td>FOCAL8-55.6</td>
</tr>
<tr>
<td>BANNER</td>
<td>BASIC8-55.7</td>
</tr>
<tr>
<td>BASEBALL</td>
<td>FOCAL8-55.8</td>
</tr>
<tr>
<td>BASIC COMPUTER GAMES</td>
<td>BASIC8-22</td>
</tr>
<tr>
<td>BASIC Storage</td>
<td>BASIC8-55.9</td>
</tr>
<tr>
<td>BASICS Single Key Reader</td>
<td>BASIC8-91</td>
</tr>
<tr>
<td>BASICS Switch Register Function</td>
<td>BASIC8-88</td>
</tr>
<tr>
<td>BASKET</td>
<td>BASIC8-55.10</td>
</tr>
<tr>
<td>BATNUM</td>
<td>BASIC8-55.11</td>
</tr>
<tr>
<td>BATTLE</td>
<td>BASIC8-101</td>
</tr>
<tr>
<td>Battle of Numbers</td>
<td>BASIC8-101</td>
</tr>
<tr>
<td>Battle of Numbers Game (Newberry College Version)</td>
<td>FOCAL8-111</td>
</tr>
<tr>
<td>BAVIRF-A Virtual File UDEF for OS/8 BASIC</td>
<td>8-732</td>
</tr>
<tr>
<td>BEST—Binary to Symbolic Traductor</td>
<td>8-636</td>
</tr>
<tr>
<td>BINGO</td>
<td>BASIC8-55.11</td>
</tr>
<tr>
<td>BIN4SV</td>
<td>8-570</td>
</tr>
<tr>
<td>BINOC</td>
<td>8-831</td>
</tr>
<tr>
<td>BJNLOAD, TSS/8 Binary Loader</td>
<td>8-683</td>
</tr>
<tr>
<td>BLACKJACK</td>
<td>BASIC8-55.14</td>
</tr>
<tr>
<td>Bond Computations</td>
<td>BASIC8-237</td>
</tr>
<tr>
<td>BOUNCE</td>
<td>BASIC8-55.16</td>
</tr>
<tr>
<td>BOWLING</td>
<td>BASIC8-55.17</td>
</tr>
<tr>
<td>Bowling League Results, Standings and Averages</td>
<td>8-686</td>
</tr>
<tr>
<td>Bowling League Tabulator</td>
<td>BASIC8-61</td>
</tr>
<tr>
<td>Bowling Record Tabulator</td>
<td>BASIC8-100</td>
</tr>
<tr>
<td>BOXING</td>
<td>BASIC8-55.18</td>
</tr>
<tr>
<td>BSCI12K: A Modification to 8K BASIC Extending the Number of Variables</td>
<td>BASIC8-97</td>
</tr>
<tr>
<td>BUG</td>
<td>BASIC8-55.19</td>
</tr>
<tr>
<td>BULCOW</td>
<td>BASIC8-55.20</td>
</tr>
<tr>
<td>BULLEYE</td>
<td>BASIC8-55.21</td>
</tr>
<tr>
<td>BULL</td>
<td>BASIC8-55.22</td>
</tr>
<tr>
<td>BUNNY</td>
<td>BASIC8-55.23</td>
</tr>
<tr>
<td>BUSINESS AND SOCIAL STUDIES-SET 1</td>
<td>BASIC8-12</td>
</tr>
<tr>
<td>BUSINESS AND SOCIAL STUDIES-SET 2</td>
<td>BASIC8-15</td>
</tr>
<tr>
<td>Business and Social Studies—Set 3</td>
<td>BASIC8-37</td>
</tr>
<tr>
<td>Business Management Laboratory</td>
<td>8-738</td>
</tr>
<tr>
<td>BUTLER AREA SCHOOL DISTRICT COMPUTER MATHEMATICS SERIES</td>
<td>BASIC8-65</td>
</tr>
<tr>
<td>BUZZWD</td>
<td>BASIC8-55.24</td>
</tr>
<tr>
<td>Cabrillo Test Grader</td>
<td>8-654</td>
</tr>
<tr>
<td>CALC</td>
<td>BASIC8-71</td>
</tr>
<tr>
<td>CALCOP Plotter FNEW PLOTX</td>
<td>FOCAL8-230</td>
</tr>
<tr>
<td>CALCUI</td>
<td>8-607</td>
</tr>
<tr>
<td>CALNDR</td>
<td>BASIC8-55.25</td>
</tr>
<tr>
<td>CAN-AM</td>
<td>BASIC8-55.26</td>
</tr>
<tr>
<td>CARD: Simplified Machine Language Simulator</td>
<td>BASIC8-103</td>
</tr>
<tr>
<td>THE CARNIVAL GAME</td>
<td>FOCAL8-79</td>
</tr>
<tr>
<td>CASE—Carleton Symbolic Editor</td>
<td>8-681</td>
</tr>
<tr>
<td>CASINO, Demos, Bombing Mission, Doggle Hangman</td>
<td>FOCAL8-307</td>
</tr>
<tr>
<td>CASTOR, Sykes Cassette Editor</td>
<td>8-812</td>
</tr>
<tr>
<td>CENTER, Sykes Cassette Editor</td>
<td>8-830</td>
</tr>
<tr>
<td>CC-FOCAL-Q</td>
<td>FOCAL8-287</td>
</tr>
<tr>
<td>CENTER OF GRAVITY CALCULATIONS</td>
<td>FOCAL8-222</td>
</tr>
<tr>
<td>CHANGE</td>
<td>BASIC8-55.27</td>
</tr>
<tr>
<td>Channel Information and Inverted Histogram Plot</td>
<td>FOCAL8-54</td>
</tr>
<tr>
<td>Channel Charge Account</td>
<td>FOCAL8-122</td>
</tr>
<tr>
<td>Checkers Program</td>
<td>FOCAL8-149</td>
</tr>
<tr>
<td>CHECKER</td>
<td>BASIC8-55.28</td>
</tr>
<tr>
<td>CHEKMO II: Chess Playing Program</td>
<td>8-822</td>
</tr>
<tr>
<td>CHEMISTRY—SET 1</td>
<td>BASIC8-8</td>
</tr>
<tr>
<td>CHEMISTRY—SET 2</td>
<td>BASIC8-9</td>
</tr>
<tr>
<td>CHEMS LAB 5</td>
<td>FOCAL8-119</td>
</tr>
<tr>
<td>CHEMIST</td>
<td>BASIC8-55.29</td>
</tr>
<tr>
<td>CHESS</td>
<td>BASIC8-69</td>
</tr>
<tr>
<td>Chi Square Utility Package, CHISQR</td>
<td>FOCAL8-261</td>
</tr>
<tr>
<td>CHIEF</td>
<td>BASIC8-55.30</td>
</tr>
<tr>
<td>CHISQ Chi Square Program</td>
<td>8-556</td>
</tr>
<tr>
<td>CHOMP</td>
<td>BASIC8-55.31</td>
</tr>
</tbody>
</table>
### Alphabetical Index

<table>
<thead>
<tr>
<th>Package/Program Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHRFSB: FORTRAN II ASCII Character Subroutine (File name CHRFSB)</td>
<td>8-841</td>
</tr>
<tr>
<td>CINET-BASIC</td>
<td>8-655</td>
</tr>
<tr>
<td>CIVILW</td>
<td>BASIC8-55.32</td>
</tr>
<tr>
<td>CLILAC, LILAC Conversion</td>
<td>BASIC8-66</td>
</tr>
<tr>
<td>CLOCK: A Real-Time Clock/Calendar Routine</td>
<td>8-857</td>
</tr>
<tr>
<td>CLUSTER Cluster Analysis Program</td>
<td>8-840</td>
</tr>
<tr>
<td>COCAS: Sykes Copy Cassette</td>
<td>8-840</td>
</tr>
<tr>
<td>Code Generator</td>
<td>FOCAL8-202</td>
</tr>
<tr>
<td>COGO-8</td>
<td>8-702</td>
</tr>
<tr>
<td>Collection of Math and Demonstration Programs</td>
<td>BASIC8-102</td>
</tr>
<tr>
<td>COLUM</td>
<td>8-335</td>
</tr>
<tr>
<td>COMPAP: Compare All Files Program</td>
<td>8-862</td>
</tr>
<tr>
<td>Compass Deviation</td>
<td>BASIC8-98</td>
</tr>
<tr>
<td>Computer Bowl</td>
<td>FOCAL8-300</td>
</tr>
<tr>
<td>Computer Catalog System</td>
<td>8-724</td>
</tr>
<tr>
<td>COMPUTER WORKSHOP</td>
<td>BASIC8-14</td>
</tr>
<tr>
<td>Constantine's Function</td>
<td>FOCAL8-49</td>
</tr>
<tr>
<td>CONVM: Interconversion of Mass and Volume Units</td>
<td>FOCAL8-328</td>
</tr>
<tr>
<td>CONVRT: 4K Disk Monitor to PS/8 File Conversion</td>
<td>8-856</td>
</tr>
<tr>
<td>CONVRT–Dollars to Deutsch Marks and Deutsch Marks to Dollars</td>
<td>FOCAL8-282</td>
</tr>
<tr>
<td>COPPER</td>
<td>8-775</td>
</tr>
<tr>
<td>COPY-PA</td>
<td>8-739</td>
</tr>
<tr>
<td>CORREL Correlation Program and PCOMP–VARMX Factor Analysis Program</td>
<td>8-558</td>
</tr>
<tr>
<td>CORVU: A Display and Teletype Input/Output Program</td>
<td>8-730</td>
</tr>
<tr>
<td>CRAPS</td>
<td>BASIC8-55.33</td>
</tr>
<tr>
<td>Critical Points of a P(x) of Degree N (Real Coefficients)</td>
<td>FOCAL8-298</td>
</tr>
<tr>
<td>CRSS80: 8080 Cross-Assembler</td>
<td>8-875</td>
</tr>
<tr>
<td>CRSTAB: Cross Tabulation Program</td>
<td>8-707</td>
</tr>
<tr>
<td>CRT: An OS/8 Handler for Tektronix 611 Storage Scope</td>
<td>8-598</td>
</tr>
<tr>
<td>CSHHS BASIC-73</td>
<td>BASIC8-50</td>
</tr>
<tr>
<td>CUBE</td>
<td>BASIC8-55.34</td>
</tr>
<tr>
<td>CURFIT</td>
<td>FOCAL8-63</td>
</tr>
<tr>
<td>Curve Fitting</td>
<td>FOCAL8-26</td>
</tr>
<tr>
<td>CVFCPTG (Centronics Vertical Format Control Paper Tape Generator)</td>
<td>FOCAL8-312</td>
</tr>
<tr>
<td>DBCONV, Decimal-Binary Converter</td>
<td>FOCAL8-309</td>
</tr>
<tr>
<td>DDCMP: Half-Duplex Subset of Digital Data Communications Message Protocol</td>
<td>8-827</td>
</tr>
<tr>
<td>DDTG: Real Time Picture Processor Monitor–Debugger</td>
<td>8-823</td>
</tr>
<tr>
<td>DDTSS8, DECtape Dump for Time Shared System-8</td>
<td>8-697</td>
</tr>
<tr>
<td>DECSYSTEM-8</td>
<td>8-646</td>
</tr>
<tr>
<td>DETCPY: One-Word Signed Decimal Print</td>
<td>8-696</td>
</tr>
<tr>
<td>Depth of Field Program for Still Camera Lenses</td>
<td>FOCAL8-179</td>
</tr>
<tr>
<td>Determination of Roots of a Polynomial</td>
<td>FOCAL8-68</td>
</tr>
<tr>
<td>DEVHND–Device Handler for Storage Scope Using AX08 (LAB-8) as Controller</td>
<td>8-782</td>
</tr>
<tr>
<td>Device Handler for Tektronix 611 Storage Scope</td>
<td>8-746</td>
</tr>
<tr>
<td>DEWP: Pressure Dewpoints</td>
<td>FOCAL8-327</td>
</tr>
<tr>
<td>DIAMND</td>
<td>BASIC8-55.35</td>
</tr>
<tr>
<td>DIBILD.; Directory Builder for PS/8 or OS/8</td>
<td>8-599</td>
</tr>
<tr>
<td>DICE</td>
<td>BASIC8-55.36</td>
</tr>
<tr>
<td>DIGIFIL: RECURSIVE DIGITAL FILTER</td>
<td>8-813</td>
</tr>
<tr>
<td>DIGITS</td>
<td>BASIC8-55.37</td>
</tr>
<tr>
<td>DIRECT: OS/8 Directory Listing Program</td>
<td>8-842</td>
</tr>
<tr>
<td>Disassembler</td>
<td>8-727</td>
</tr>
<tr>
<td>Disassembler with Symbols</td>
<td>8-18</td>
</tr>
<tr>
<td>Disassembler with Symbols, Modifications for use without EAE</td>
<td>8-179</td>
</tr>
<tr>
<td>DISEDU–Loading EDU System-20 on the 4K Disk Monitor System</td>
<td>BASIC8-51</td>
</tr>
<tr>
<td>DIV: Program for Division</td>
<td>FOCAL8-239</td>
</tr>
<tr>
<td>DOGLBAD: A Subroutine to Calculate Polarity-Quantized Autocorrelograms</td>
<td>8-781</td>
</tr>
<tr>
<td>DOGS</td>
<td>BASIC8-55.38</td>
</tr>
<tr>
<td>Dose Calculation of Irregular Fields</td>
<td>8-799</td>
</tr>
<tr>
<td>DPSQRT–Double Precision Square Root for PDP-8</td>
<td>8-685</td>
</tr>
<tr>
<td>DRANO</td>
<td>FOCAL8-291</td>
</tr>
<tr>
<td>DSKFIL: A File Structured Disk Writing Routine and Helpers</td>
<td>8-657</td>
</tr>
<tr>
<td>DSPP: Diagnostic Support Package for the PDP-8</td>
<td>8-735</td>
</tr>
<tr>
<td>DUMP and LOAD, TSS/8</td>
<td>8-624</td>
</tr>
<tr>
<td>DUMPPOS–Dumps OS/8 ASCII Files</td>
<td>8-765</td>
</tr>
<tr>
<td>DYNOD: DYNAMIC OCTAL DEBUGGER</td>
<td>8-811</td>
</tr>
<tr>
<td>EAE Patches to FOCAL</td>
<td>FOCAL8-313</td>
</tr>
<tr>
<td>EARTH SCIENCE-SET I</td>
<td>BASIC8-11</td>
</tr>
<tr>
<td>ED-50</td>
<td>FOCAL8-117</td>
</tr>
<tr>
<td>EDAS-Editing and Assembling System</td>
<td>8-768</td>
</tr>
<tr>
<td>EDTIV–Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III</td>
<td>8-783</td>
</tr>
<tr>
<td>EMLP: Emory Linear Programming Package</td>
<td>8-708</td>
</tr>
<tr>
<td>The Entertainer</td>
<td>8-804.1</td>
</tr>
<tr>
<td>Erlang C Blocking Probability Programs</td>
<td>FOCAL8-163</td>
</tr>
<tr>
<td>Evaluation of Double Integrals</td>
<td>FOCAL8-339</td>
</tr>
<tr>
<td>EVEN</td>
<td>BASIC8-55.39</td>
</tr>
<tr>
<td>Execute Slow</td>
<td>8-400</td>
</tr>
<tr>
<td>Executive and Utility Routines for FOCALX, 1972</td>
<td>FOCAL8-245</td>
</tr>
<tr>
<td>EXPFP-Extensions PIF</td>
<td>8-600</td>
</tr>
<tr>
<td>Extended Double Precision Interpretive Package</td>
<td>8-658</td>
</tr>
<tr>
<td>Extended Precision Sine and Cosine for 4-word FOCAL</td>
<td>8-810</td>
</tr>
<tr>
<td>Extensions To OS/8 BASIC</td>
<td>8-860</td>
</tr>
<tr>
<td>F-(Variance Ratio) Distribution Probability</td>
<td>FOCAL8-165</td>
</tr>
<tr>
<td>FACTORS</td>
<td>8-717</td>
</tr>
<tr>
<td>FARRAY, A FOCAL FNEW for Two Dimensional Arrays in 8K FOCAL</td>
<td>FOCAL8-216</td>
</tr>
<tr>
<td>Fast Fourier Transform Subroutines</td>
<td>FOCAL8-151</td>
</tr>
<tr>
<td>Fast Matrix Inversion for Real Numbers</td>
<td>FOCAL8-804.1</td>
</tr>
<tr>
<td>FASTAD–User Oriented Data Collection on One A/DC Channel</td>
<td>8-760</td>
</tr>
<tr>
<td>FFT or IFFT of an Analogue Signal with the LAB-8 System</td>
<td>8-809</td>
</tr>
<tr>
<td>FFTTS-R Patch for Use Without EAE</td>
<td>8-446</td>
</tr>
<tr>
<td>FILE–Text Data File Program for TSS/8 BASIC-4</td>
<td>BASIC8-47a</td>
</tr>
<tr>
<td>FILIX–TSS/8 File Structure Repairing and Restructuring Program</td>
<td>8-743</td>
</tr>
<tr>
<td>Filter Design</td>
<td>FOCAL8-181</td>
</tr>
<tr>
<td>FINCA: A Computer Program for Financial Statement Analysis</td>
<td>8-709</td>
</tr>
<tr>
<td>FIPFOP</td>
<td>BASIC8-55.41</td>
</tr>
<tr>
<td>FIFP: First and Second Order Partial Correlations</td>
<td>FOCAL8-166</td>
</tr>
<tr>
<td>First Order Differential Equation: Initial Value Problem</td>
<td>FOCAL8-182</td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td>FOCAL8-196</td>
</tr>
<tr>
<td>Fisher's F, Student's t and Chi Squared Distributions</td>
<td>FOCAL8-308</td>
</tr>
<tr>
<td>Five Statistical Programs for the PDP-8 or PDP-12</td>
<td>FOCAL8-167</td>
</tr>
<tr>
<td>Five Word Floating Point Package for PDP-8</td>
<td>8-796</td>
</tr>
<tr>
<td>FLSITO</td>
<td>FOCAL8-130</td>
</tr>
<tr>
<td>FLIST: OS/8 FORTIV IV: Listings without Recompiling</td>
<td>8-844</td>
</tr>
<tr>
<td>Floating Integer Functions for use with 8K FORTIV</td>
<td>8-425</td>
</tr>
<tr>
<td>FOCAL 5/69 Input Buffer Patch</td>
<td>FOCAL8-274</td>
</tr>
<tr>
<td>FOCAL 5/69 with Ancillary Programs</td>
<td>FOCAL8-332</td>
</tr>
<tr>
<td>FOCAL 5/69</td>
<td>FOCAL8-52</td>
</tr>
<tr>
<td>FOCAL: How to Write New Subroutines and Use Internal Functions</td>
<td>FOCAL8-17</td>
</tr>
<tr>
<td>FOCAL Generates Binary Patches and Disassembles Binary Tapes</td>
<td>FOCAL8-329</td>
</tr>
<tr>
<td>FOCAL Lunar Landing Simulation (APOLLO)</td>
<td>FOCAL8-81</td>
</tr>
<tr>
<td>A FOCAL-8 Program for Fitting the Equation C = 4(1 – e−x)</td>
<td>FOCAL8-278</td>
</tr>
<tr>
<td>FOCAL Readable Punch</td>
<td>FOCAL8-48</td>
</tr>
<tr>
<td>FOCAL Traveling-Wave Sketches</td>
<td>FOCAL8-129</td>
</tr>
<tr>
<td>FOCAL Version of RC Active Filter</td>
<td>FOCAL8-106</td>
</tr>
<tr>
<td>FOCAL Version of the GE Basic Artillery Game</td>
<td>FOCAL8-169</td>
</tr>
<tr>
<td>FOCAL-SLOT</td>
<td>FOCAL8-127</td>
</tr>
</tbody>
</table>

92
<table>
<thead>
<tr>
<th>Alphabetical Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOCL/ SORT</td>
</tr>
<tr>
<td>FOCLINUS-Molecular Geometry Calculator</td>
</tr>
<tr>
<td>FOCL/P—An Extended Version of 8K FOCL/69</td>
</tr>
<tr>
<td>FOCLAB—A Language for Computer Controlled Pathology</td>
</tr>
<tr>
<td>FOCLX, 1972</td>
</tr>
<tr>
<td>FOCTXT</td>
</tr>
<tr>
<td>FOCLX, A Language for Computer Controlled Pathology</td>
</tr>
<tr>
<td>FOOTBALL</td>
</tr>
<tr>
<td>FOOTBALL</td>
</tr>
<tr>
<td>Football Scouting Report Systems</td>
</tr>
<tr>
<td>FOOTBL</td>
</tr>
<tr>
<td>FOPAY—Weekly Payroll Deductions and Computations</td>
</tr>
<tr>
<td>FORTRAN II Library Subroutines</td>
</tr>
<tr>
<td>FORTRAN IV for OS/8 FORTRAN II Users</td>
</tr>
<tr>
<td>FORTRAN IV Graphics Subroutines</td>
</tr>
<tr>
<td>FOORTAB</td>
</tr>
<tr>
<td>Four Word Floating Point Routines</td>
</tr>
<tr>
<td>FP8—Floating Point Arithmetic for DEC PDP-8 Series Computers</td>
</tr>
<tr>
<td>FRAN THE BARMIDA</td>
</tr>
<tr>
<td>French Language FOCL 5/69</td>
</tr>
<tr>
<td>FREQS—A Subroutine to Generate a Frequency Histogram From Stored Interval Measurements</td>
</tr>
<tr>
<td>Frequency Transformation Program</td>
</tr>
<tr>
<td>FSPACE—Space Command for FOCL '69</td>
</tr>
<tr>
<td>FTMULT: EAE Multiplication for 8K FORTRAN</td>
</tr>
<tr>
<td>Function Comp.FT</td>
</tr>
<tr>
<td>FURS</td>
</tr>
<tr>
<td>FUTIL—OS/8 File Utility</td>
</tr>
<tr>
<td>FWNO—FOCAL WRITE NULLS OVERLAY</td>
</tr>
<tr>
<td>FX Function for Random Access Files</td>
</tr>
<tr>
<td>Geometry Routines, Prime Numbers, Buffon's Needle Theorem, Markov GET Command for the Disk/DECEtape Monitor System</td>
</tr>
<tr>
<td>GAMES, Set 4</td>
</tr>
<tr>
<td>GAMES—SET 1</td>
</tr>
<tr>
<td>GAMES—SET 2</td>
</tr>
<tr>
<td>GAMES—SET 3</td>
</tr>
<tr>
<td>GAMES—SET 5</td>
</tr>
<tr>
<td>Gas Law Programs</td>
</tr>
<tr>
<td>GASSETR</td>
</tr>
<tr>
<td>General Least Squares Fit</td>
</tr>
<tr>
<td>General Nth Order Regression</td>
</tr>
<tr>
<td>GEOMAS</td>
</tr>
<tr>
<td>GET Command for the Disk/DECEtape Monitor System</td>
</tr>
<tr>
<td>GOLFF</td>
</tr>
<tr>
<td>GOLFF</td>
</tr>
<tr>
<td>Golf Program</td>
</tr>
<tr>
<td>GOMOKO</td>
</tr>
<tr>
<td>GPATCH</td>
</tr>
<tr>
<td>Graph Sketching</td>
</tr>
<tr>
<td>Graphics Package for the Tektronix 4010 Under OS/8</td>
</tr>
<tr>
<td>Graphing Subroutines for 8K FORTRAN Programs</td>
</tr>
<tr>
<td>Gray Code Conversion Package</td>
</tr>
<tr>
<td>Great Circle Course and Distance</td>
</tr>
<tr>
<td>Great Circle Distance Between 2 Points</td>
</tr>
<tr>
<td>GUESS</td>
</tr>
<tr>
<td>GUNNER</td>
</tr>
<tr>
<td>H-800 Wiring Diagrams</td>
</tr>
<tr>
<td>Hamming Algorithm to Solve Two Coupled Ordinary First Order Differential Equations with Given Initial Conditions</td>
</tr>
<tr>
<td>HANG</td>
</tr>
<tr>
<td>Hangman Game</td>
</tr>
<tr>
<td>HANGMAN IV</td>
</tr>
<tr>
<td>Hearing Loss Simulator</td>
</tr>
<tr>
<td>Heat Loss Calculation</td>
</tr>
<tr>
<td>HELLO</td>
</tr>
<tr>
<td>HEX</td>
</tr>
<tr>
<td>Hexapawn</td>
</tr>
<tr>
<td>HI-LO</td>
</tr>
<tr>
<td>HI-Q</td>
</tr>
<tr>
<td>High Speed Punch, High Speed Write, and FRAN Overlays to FOCL '69</td>
</tr>
<tr>
<td>HMRABI</td>
</tr>
<tr>
<td>HOCKEY</td>
</tr>
<tr>
<td>Horserace</td>
</tr>
<tr>
<td>HORSEPLACE</td>
</tr>
<tr>
<td>HORSES</td>
</tr>
<tr>
<td>HORSET-S/8 HORSE RACING PROGRAM</td>
</tr>
<tr>
<td>HURKEL</td>
</tr>
<tr>
<td>Hybrid Operation in FOCL for EAL380-PDP-8/e System</td>
</tr>
<tr>
<td>IFAC—A FORTRAN Program for Parameter Estimation</td>
</tr>
<tr>
<td>Improved EAE Routine for FOCL</td>
</tr>
<tr>
<td>Improved Mini Debugging Technique</td>
</tr>
<tr>
<td>Improved Multiply Loop for FOCL</td>
</tr>
<tr>
<td>Individual Tablet Assay</td>
</tr>
<tr>
<td>INDUMP—Input Dump</td>
</tr>
<tr>
<td>INTR—500 Survival Tests</td>
</tr>
<tr>
<td>Information Retrieval Programs</td>
</tr>
<tr>
<td>Injection Packet—JIPA</td>
</tr>
<tr>
<td>INPUT: A Neurophysiological Data Collecting Program</td>
</tr>
<tr>
<td>Integer IOH for FORTRAN Library</td>
</tr>
<tr>
<td>Interrupt Bus Testing Program</td>
</tr>
<tr>
<td>INTERVAL—A Subroutine to Measure Inter-Event Intervals</td>
</tr>
<tr>
<td>INVENT-8</td>
</tr>
<tr>
<td>IPSLAV: Slave Program, and DB8E Interprocessor Buffer Handler</td>
</tr>
<tr>
<td>JUMBLE; ONETWO</td>
</tr>
<tr>
<td>KCF Temperature Conversion Table</td>
</tr>
<tr>
<td>KINEMA</td>
</tr>
<tr>
<td>KING</td>
</tr>
<tr>
<td>KLTSTT—KL8/E, KL8/J Diagnostic</td>
</tr>
<tr>
<td>Knight's Tour</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Test for Normality</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Two Sample Two-Tailed Test for Large Samples of Non-Parametric Data</td>
</tr>
<tr>
<td>KRIEVSPIEL</td>
</tr>
<tr>
<td>Krakusa-Wallis One Way Analysis of Variance by Ranks</td>
</tr>
<tr>
<td>KV8/1-VT01 Device Handler</td>
</tr>
<tr>
<td>LABEL</td>
</tr>
<tr>
<td>LABL—Legible Leader Handler for OS/8</td>
</tr>
<tr>
<td>LABLD-P—TSS/8 Tape Labeling Program</td>
</tr>
<tr>
<td>Laboratory and Display Instructions for OS/8</td>
</tr>
<tr>
<td>LABORATORY and Real Time Patch With FNEW FOCL 5/69</td>
</tr>
<tr>
<td>LCRU—LC Resonance with Units</td>
</tr>
<tr>
<td>Least Square Fit to a Polynomial</td>
</tr>
<tr>
<td>Least Squares Fit to an Exponential</td>
</tr>
<tr>
<td>LEP—Linear, Exponential and Power Function</td>
</tr>
<tr>
<td>LESQ, General Non-Linear Least Squares</td>
</tr>
<tr>
<td>LINEAR</td>
</tr>
<tr>
<td>LIB12—Mathematical and Graphing Routines</td>
</tr>
<tr>
<td>LIB17—Package of Mathematical Routines</td>
</tr>
<tr>
<td>LIB8X: FORTRAN II EAE Library</td>
</tr>
<tr>
<td>LIB9: Extended Precision Routines for Basics</td>
</tr>
<tr>
<td>LIFE</td>
</tr>
<tr>
<td>LIFE</td>
</tr>
<tr>
<td>LIFE</td>
</tr>
<tr>
<td>LILAC: Laband's Ingenious Little Automatic Computer Laband's</td>
</tr>
</tbody>
</table>
LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM

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

MTFOTF: TM8E Magnetic Tape Package
(January 1978)

MGWMP: BASIC8-55.67

MULTC Multiple Correlation Program
Multichannel Analyzer

Multidimensional Integration by Gaussian Quadrature

Multiple Choice Quiz
Multiple Equation Graphing on a Teletype
Multiplication of Rectangular Matrices
MULTIPULSE

MULTS: Multiple Regression Program
N.I.H. OS/8 Package

NAMES

NANCY.BA

NEOPAL, PAL-D SIMULATOR
Neurophysiological Data Collecting Program
Newton Binominal

Newton-Raphson Method for Determination of Polynomial Roots

NICOMA

NIM

NLYSIS, POSTER2, CLNDR5, PIDART
Non-Parameters: The Mann-Whitney U Test and the Wilcoxon Matched-Pairs Sign-Ranks Test

NORDER-A Subroutine to Generate nth Order Histograms from Inter-Event Intervals

A Normally Distributed Random Number Generator in FOCAL

NSD-Nominal Standard Dose

NUMBER

NUMBER and REDATE-OS/8 File Utility Programs

OASIS

OCOMP-Octal Compare and Dump

OLEVX AND OLEVAX, 4-Channel Averager and Analysis System

OMS30 BASIC

One Pass PAL-III

One-Armed Bandit

One-Armed Bandit-PDP-8 Style

Online Graph—With Self Determining Scale Factor

OPTION $"'

ORBIT

OS/8 Compatible VCS-E Handler for Mass Storage Systems

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

OS/8 DISASM

OS/8 EDIT PLUS

OS/8 FORMAT

OS/8 FORTRAN-IV Routes

OS/8 Handler for Tektronix 4406-1 Graphic Terminal As Console Device

OS/8 Handler for The Variang Statos 21 Line Printer

OS/8 Magtape Handler and Utility

OS/8 Non-System Device Handler For Sykes 7250 Floppy Disk

OS/8 Software for a TCS8 Magtape Control

OS/8 System Device Handler For Sykes 7250 Floppy Disk

OS/8 System Output Handlers

OS/8 to RSTS Interface

OS/8 Utility Package

Overlay for KV8I-OMSI FOCAL 1971

PAGER

PAL 8 x 2

PAL12D

PALLUX: Sykes Cassette PAL III Assembler

Paper Tape Display

94
Alphabetical Index

Paper Tape Message Generator
Paper Tape Reader-Printer
Patch to Allow Computed Line Numbers in FOCAL, 1969
Payroll Listings and Totals
PCOL—Pipe Column Selection
The PDP-8 Cookbook, Volume 1
PDP-8 Cookbook, Volume 2
PFCF—Polynomial Function Curve Fitting
PFI—Product Form of the Inverse
PHA-8 Data Acquisition System
The Phi Phenomenon
Physical Sine Curve Programs
PHYSICS—SET 1
PHYSICS—SET 2
PING-PONG
PISA
PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
PLOTTER
Plotting Package for OS/8 FORTRAN IV
Plotting Subroutines for OS/8 FORTRAN II
PLOTTING—SET 1
PLOTTY—A Program to Plot a Function On a Teletype
PLTPKG—Mathematical TTY Plotting Package
POET
POETRY
POKER
POKER
Polynomial Curve Fitting (Streamlined Programs)
POSTER
POSTER, SIGNS
PRGSCH—TSS/8 Program Searcher
Probability (2P); From t (“Student”) Distribution
Probability Density Functions of Analogue Signals with the LAB-8 System
Probfit Analysis
PROCESS: An Image Processing Program for the PDP-8E
Program for Producing Histograms from Clinical Data on Teletype
Program Replication
Program System to Analyze Analogue Signals with the LAB-8 System
Program to Find Real Roots of a Polynomial Equation of Degree N (an integer) With Real Coefficients
A Program to Relocate and Pack Programs in Binary Format
A Programmed Learning Course in Boolean Algebra
Protein Binding: PROBON 1—Fraction Bound, PROBON 2—Total Drug
PROVE—8; V03
Pseudo Random Number Generator for use with FOCAL
PRTRPA: RTS Handler Task for High Speed Paper Tape Reader and Punch
Pulmonary Function Laboratory Programs
Punched Paper Tape Generator With Randomization Using FOCAL (1969)
QCHESS: Quigley’s Algebraic Chess Program
QUBIC
QUEEN
“QUICK SCAN” Using Scheeve’s Calculation
QUICKPOINT-8: Numerical Control System
RACK-O
Radioisotopes Production Problems
Random Number Generator
Random Number Generator for the PDP-5/8
Random Number Generators for Use With FORTRAN or SABR Programs
Random Walk/Array
RANDU
RANF—A Pseudo-Random Number Generator for OS/8 FORTRAN IV
Rational Roots of a Polynomial Equation
RAW—A Reverse Assembler of Windsor
Read TEF FOCAL on the PDP-8 Computer
RECOVE—BASIC RECOVERY FROM CRASH
Rectangular to Polar Coordination (German)
The Recursive Evaluation of Functions
Regression Analysis Package
Repeated Matrix Multiplication
Repeating Decimal
REPROD—Read, Punch and Verify Product
RESOLUTION (A revision of DECUS8402)
Reverse Assembler
REVRSE
RINNOR: A Roll-in, Roll-out Program
RLJ: System for PDP-8/E (IBM 2780 Emulator)
RKCOPY
RL Monitor System (WCFMPG Version)
ROCKET
Roots by Inverse Interpolation
ROOTS, A Polynomial Root Finder
ROULET
Roots to Expand and Modify the DEC Floating Point Package
RSTS Terminal Monitor On A PDP-8
RUBEN
RUNOFF V.6
RUSROU
RWDF2
SAC8: Simulation of an Analogue Computer
SADSAC
Saint Peter’s College Statistical Package
SALVO
Satellite Orbital Parameters
Science Fiction Quiz
Scrambled Word Generator
Screening Regression
SDSYS and SD8X—Two Handlers for the TDSE
Simple DECtape
SDBOOT: A Short Bootstrap for a non-OS/8
Sekyes 7100 Floppy Disk System
Self-Teaching Program for FOCAL
SELFDRILL—The Sloan Selfdrill Program
SELFDR—The Selfdrill Program, 8K Version
Semi-Automatic Braille Embosser
SEQ; SAME; STAT1
Serial Input/Output Handlers For Interprocessor Communications
Short Programs for Statistical Analysis Using FOCAL
SIMBA—A PDP-8/E Oscilloscope Symbol Generator
SIMCOM
SIMEQR—20 Simultaneous Equations in 8K
Simple ASCII Editor and Tape Reproducer
Simple Chi-Square Test
SIMPLE: The Simplex Method to Fit Equations to Data
SINCOS-SIN and COS Functions Graphing
Simple DECtape
Six Curves—GMS037
SLED—Source and Listing Editor
SLOTS
SNAP: Simplified Numerical Analysis for use with EAE
SNAP: Simplified Numerical Analysis
F O C A L - 8 8 6 7
F O C A L - 8 8 2 5
F O C A L - 8 2 4 9
F O C A L - 8 3 2 4
8 6 0 2 A
8 6 0 2 B
8 7 7 8
F O C A L - 8 1 2 0
8 6 2 0
F O C A L - 8 2 7 1
F O C A L - 8 8 2
B A S I C 8 - 6
B A S I C 8 - 7
B A S I C 8 - 7 4
8 6 0 6
8 7 2 5
B A S I C 8 - 7 0
F O C A L - 8 1 2 1
8 8 1 6
F O C A L - 8 1 2 6
8 6 7 0
8 7 1 3
B A S I C 8 - 4
B A S I C 8 - 8 4
B A S I C 8 - 8 3
B A S I C 8 - 5 5 7 5
B A S I C 8 - 5 5 7 4
B A S I C 8 - 1 8
B A S I C 8 - 5 5 7 6
F O C A L - 8 2 3 6
B A S I C 8 - 7 3
B A S I C 8 - 5 2
8 7 7 1
F O C A L - 8 1 2 8
8 8 0 8
F O C A L - 8 3 2 1
8 8 1 4
F O C A L - 8 1 7 6
F O C A L - 8 8 5
8 8 2 6
F O C A L - 8 1 0 9
B A S I C 8 - 1 0
F O C A L - 8 2 6 2
8 7 9 2
F O C A L - 8 1
8 8 0 5
8 6 3 0
P R A T I F A: RTS Handler Task for High Speed Paper Tape Reader and Punch
F O C A L - 8 2 7 2
B A S I C 8 - 1 0 4
B A S I C 8 - 2 6 1
B A S I C 8 - 5 5 7 7
B A S I C 8 - 5 5 7 8
F O C A L - 6 6
8 8 3 7 7
F O C A L - 7 8
F O C A L - 3 3 3
F O C A L - 8 6 7 7
F O C A L - 8 6 7 3
F O C A L - 2 0 5
8 6 9 0
F O C A L - 8 7 9 3
B A S I C 8 - 8 9
8 6 6 8
F O C A L - 7 9 4
F O C A L - 8 4 2
F O C A L - 1 9 4
F O C A L - 8 8 9
8 6 5 2
F O C A L - 1 4 3
F O C A L - 2 4 5
8 6 6 3
B A S I C 8 - 5 8
8 1 7 8
B A S I C 8 - 5 5 7 9
8 7 9 5
B A S I C 8 - 8 5 8 5
8 6 3 2
8 8 0 6
B A S I C 8 - 8 2
B A S I C 8 - 1 7 0
B A S I C 8 - 5 5 8 6
B A S I C 8 - 2 4 1
F O C A L - 2 4 0
B A S I C 8 - 9 4
F O C A L - 7 6
8 7 4 1
F O C A L - 1 1 5
8 7 6 6
B A S I C 8 - 2 3
B A S I C 8 - 2 0 0
8 7 7 4
F O C A L - 4 0
F O C A L - 3 3 0
B A S I C 8 - 7 5
F O C A L - 2 5 0
8 6 1 1
B A S I C 8 - 5 5 8 8
8 1 2 2 B
8 1 2 2 A
## Section 4.2
### CATEGORY INDEX

### Categories

<table>
<thead>
<tr>
<th>IA.</th>
<th>Monitors, Programming Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-466</td>
<td>RL Monitor System (WCFMPG Version)</td>
</tr>
<tr>
<td>8-604</td>
<td>GET Command for the Disk/DECtape Monitor System</td>
</tr>
<tr>
<td>8-644</td>
<td>MINMON-TD8E DECtape Minimonitor</td>
</tr>
<tr>
<td>8-646</td>
<td>DECSystem-8</td>
</tr>
<tr>
<td>8-653</td>
<td>MTAPER-8K Magtape Monitor (TR05-A Interface) and 8K FORTRAN I/O</td>
</tr>
<tr>
<td>8-768</td>
<td>EDAS-Editing and Assembling System</td>
</tr>
<tr>
<td>8-770</td>
<td>Moss-4K TD8E DECtape System</td>
</tr>
<tr>
<td>FOCAL8-287</td>
<td>CC-FOCAL-Q</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IB.</th>
<th>Languages, Compilers, Interpreters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-84</td>
<td>One Pass PAL-III</td>
</tr>
<tr>
<td>8-91</td>
<td>MICRO-8 On-Line Assembler</td>
</tr>
<tr>
<td>8-102</td>
<td>LISP Interpreter for the PDP-8</td>
</tr>
<tr>
<td>8-213</td>
<td>ALGOL (4K Version)</td>
</tr>
<tr>
<td>8-335</td>
<td>COLPAC</td>
</tr>
<tr>
<td>8-466</td>
<td>RL Monitor System (WCFMPG Version)</td>
</tr>
<tr>
<td>8-497</td>
<td>8BAL PDP-8 Macro Language, Version 4</td>
</tr>
<tr>
<td>8-530</td>
<td>8BALIB Macro Library Generator</td>
</tr>
<tr>
<td>8-601</td>
<td>OASIS</td>
</tr>
<tr>
<td>8-628</td>
<td>LISP Interpreter for PDP-8 with OS/8</td>
</tr>
<tr>
<td>8-633</td>
<td>MACS-8K MACRO ASSEMBLER</td>
</tr>
<tr>
<td>8-635</td>
<td>PAL12D</td>
</tr>
<tr>
<td>8-662</td>
<td>Undefined Symbol List for MACRO-8</td>
</tr>
<tr>
<td>8-676</td>
<td>MACRO-8 Patch to Move DELETE Routine</td>
</tr>
</tbody>
</table>

| 8-734 | Microprocessor Language Assembler for OS/8 |
| 8-751 | FORTRAN IV for OS/8 FORTRAN II Users |
| 8-819 | PAL 8 x 2 |
| 8-839 | PALLUX: Sykes Cassette PAL III Assembler |
| 8-864 | SNOBOL 8.2 Compiler |
| 8-875 | CRS80: 8080 Cross-Assembler |
| BASIC8-41 | OMSI30 BASIC |
| BASIC8-87 | BSC12K: A Modification to 8K BASIC Extending the Number of Variables |
| FOCAL8-17 | FOCAL: How to Write New Subroutines and Use Internal Functions |
| FOCAL8-52 | FOCAL 5/69 |
| FOCAL8-223 | FOCLX, 1972 |
| FOCAL8-227 | FOCL/F--An Extended Version of 8K FOCAL/69 |
| FOCAL8-248 | FOCTXT--Text Input-Output Patch to FOCAL-1969 |
| FOCAL8-254 | Patch to Allow Computed Line Numbers in FOCAL, 1969 |
| FOCAL8-256 | OPTION 5 |
| FOCAL8-259 | High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69 |
| FOCAL8-268 | FX Function for Random Access Files |
| FOCAL8-269 | 4K FOCAL '69 SPEED-UP PATCHES |
| FOCAL8-274 | FOCAL 5/69 Input Buffer Patch |
| FOCAL8-281 | French Language FOCAL 5/69 |
| FOCAL8-287 | CC-FOCAL-Q |
| FOCAL8-288 | FSPACE-Space Command for FOCAL '69 |
| FOCAL8-293 | A Laboratory and Real Time Patch with FNEW FOCAL 5/69 |
| FOCAL8-294 | Real Time FOCAL on the PDP-8 Computer |
| FOCAL8-301 | U/W FOCAL |
| FOCAL8-313 | EAE Patches to FOCAL |
| FOCAL8-319 | FOCLAB-A Language for Computer Controlled Psychology |
FOCAL8-325  FWN0-FOCAL WRITE NULLS OVERLAY
FOCAL8-332  FOCAL 5/69 with Ancillary Programs
FOCAL8-334  FXUI2: A Machine-Code “Execute” Function
Overlay to U/W-FOCAL
FOCAL8-335  TFOCAL: A 4K Tape FOCAL

II. Text Editors, Text Manipulation

8-601  OASIS
8-611  SLED—Source and Listing Editor
8-623  PAGER
8-627  TEXPAX—Program to Convert a Line of Text to Packed Octal Format
8-640  OS/8 EDIT PLUS
8-641  OS/8 FORMAT
8-681  CASE—Carleton Symbolic Editor
8-731  MEMO IV
8-747  STAGE2 Macro Processor
8-756  ASCON—ASCII File Converter
8-768  EDAS—Editing and Assembling System
8-774  Simple ASCII Editor and Tape Reproducer
8-783  EDITV—Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III
8-785  GPATCH
8-786  TSS/8 FORMAT
8-830  CASTOR: Sykes Cassette Editor
8-880  RUNOFF V.6
8-844  FLIST: OS/8 FORTRAN IV: Listings without Re-compiling
BASIC8-58  RESEQUENCE (A revision of DECUS8-402)
BASIC8-92  Symbolic Editor Program

III. Debugging, Disassembly, Trace, Dump

8-18  Disassembler with Symbols
8-89  XOD—Extended Octal Debugging Program
8-127  XDDT Extended Octal-Symbolic Debugging Program
8-178  Reverse Assembler
8-179  Disassembler with Symbols, Modifications for Use without EAE
8-400  Execute Slow
8-527  XDDTD8E
8-608  FUTIL-OS/8 File Utility
8-636  BEST—Binary to Symbolic Traductor
8-639  OS/8 DISASM
8-668  RAW—A Reverse Assembler of Windsor
8-679  MAPPER
8-697  DDTSS8, DECtape Dump for Time Shared System-8
8-720  LSTDMP: Binary Tape Dump/Lister
8-728  MEND
8-730  CORVU: A Display and Teletype Input/Output Program
8-736  Paper Tape Reader-Printer
8-784  TSS/8 TRACE and TSS/8 LTRACE
8-811  DYNOB: DYNAMIC OCTAL DEBUGGER
8-829  Improved Mini Debugging Technique
8-870  Interrupt Bus Testing Program
FOCAL8-329  FOCAL Generates Binary Patches and Disassembles Binary Tapes

IV. Binary Loading and Punching

8-32  A Program to Relocate and Pack Programs in Binary Format
8-605  ADUMP
8-672  XCBL and XBIN Loader
8-683  BNLOAD, TSS/8 Binary Loader
8-684  Injection Patcher—IIJA
8-803  FOLMAT

V. Duplication, Verification

8-609  OCOMP—Octal Compare and Dump
8-663  REPROD—Read, Punch and Verify Product
8-789  RKCOPY
FOCAL8-85  Program Replication

VI. Math Routines, Numerical and Logical Functions

8-103  Four Word Floating Point Routines
8-122A  SNAP: Simplified Numerical Analysis
8-375  Three Page Floating Point Package
8-538  Integer IOH for FORTRAN Library
8-594  FP8—Floating Point Arithmetic Software for DEC PDP-8 Series
8-615  FTMULT: EAE Multiplication for 8K FORTRAN
8-621  Gray Code Conversion Package
8-625  Floating Integer Functions for use with 8K FORTRAN
8-631  MINT—Multiple Precision Integer Arithmetic Subroutine
8-658  Extended Double Precision Interpretive Package
8-678  Routine to Expand and Modify the DEC Floating Point Package
8-685  DPSQRT—Double Precision Square Root for PDP-8
8-696  DECTYP, One-Word Signed Decimal Print
8-706  BITSET
8-717  F4EAE—EAE OVERLAY FOR FRTS
8-723  Function Comp.FT
8-740  Theorem Prover for the Propositional Calculus
8-759  USLIBA-FORTRAN II Subroutines for Binary Data Transfer
8-796  Five Word Floating Point Package for PDP-8
8-802  SSP: Scientific Subroutine Package
8-809  FFT or IFFT of an Analogue Signal with the LAB-8 System
8-821  OS/8 FORTRAN IV Routines
8-828  LIBXX: FORTRAN II EAE Library
8-841  CHRFSB: FORTRAN II ASCII Character Subroutine (File name CHRFSB)
8-852  FORTRAN II Library Subroutines
8-860  Extensions To OS/8 BASIC
8-868  MLDU—Multiplication and Division Subroutines
8-869  BASIC8-68  BASIC Storage
8-878  BASIC8-88  BASIC8 Switch Register Function
FOCAL8-49  Constantine’s Function
FOCAL8-64  Newton-Raphson Method for Determination of Polynomial Roots

FOCAL8-68  Determination of Roots of a Polynomial
FOCAL8-89  The Recursive Evaluation of Functions
FOCAL8-91  Multiplication of Rectangular Matrices
FOCAL8-94  Multidimensional Integration by Gaussian Quadrature
### Category Index

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII. Utility</td>
<td></td>
</tr>
<tr>
<td>8-570</td>
<td>BIN4SV</td>
</tr>
<tr>
<td>8-597</td>
<td>N.I.H. OS/8 Package</td>
</tr>
<tr>
<td>8-599</td>
<td>DIBILD; Directory Rebuilder for PS/8 or OS/8</td>
</tr>
<tr>
<td>8-600</td>
<td>EXPIF-Extensions PIP</td>
</tr>
<tr>
<td>8-602A</td>
<td>The PDP-8 Cookbook, Volume 1</td>
</tr>
<tr>
<td>8-602B</td>
<td>PDP Cookbook, Volume 2</td>
</tr>
<tr>
<td>8-606</td>
<td>PIP11 DOS-11 Format DECape Utility</td>
</tr>
<tr>
<td>8-608</td>
<td>FUTIL-OS/8 File Utility</td>
</tr>
<tr>
<td>8-609</td>
<td>OCOMP-Octal Compare and Dump</td>
</tr>
<tr>
<td>8-624</td>
<td>DUMP and LOAD, TSS/8</td>
</tr>
<tr>
<td>8-667</td>
<td>LABLDP-A TSS/8 Tape Labeling Program</td>
</tr>
<tr>
<td>8-677</td>
<td>STAR PIP</td>
</tr>
<tr>
<td>8-689</td>
<td>UFDSYP-A TSS/8 Line-Printer UFDP Dump Program</td>
</tr>
<tr>
<td>8-697</td>
<td>DDTSS8, DECape Dump for Time Shared System-8</td>
</tr>
<tr>
<td>8-739</td>
<td>COPY PA</td>
</tr>
<tr>
<td>8-743</td>
<td>FILFIX-TSS/8 File Structure Repairing and Restructuring Program</td>
</tr>
<tr>
<td>8-750</td>
<td>Paper Tape Display</td>
</tr>
<tr>
<td>8-754</td>
<td>NUMBER and REDATE-OS/8 File Utility Programs</td>
</tr>
</tbody>
</table>

### VII. Utility

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-570</td>
<td>BIN4SV</td>
</tr>
<tr>
<td>8-597</td>
<td>N.I.H. OS/8 Package</td>
</tr>
<tr>
<td>8-599</td>
<td>DIBILD; Directory Rebuilder for PS/8 or OS/8</td>
</tr>
<tr>
<td>8-600</td>
<td>EXPIF-Extensions PIP</td>
</tr>
<tr>
<td>8-602A</td>
<td>The PDP-8 Cookbook, Volume 1</td>
</tr>
<tr>
<td>8-602B</td>
<td>PDP Cookbook, Volume 2</td>
</tr>
<tr>
<td>8-606</td>
<td>PIP11 DOS-11 Format DECape Utility</td>
</tr>
<tr>
<td>8-608</td>
<td>FUTIL-OS/8 File Utility</td>
</tr>
<tr>
<td>8-609</td>
<td>OCOMP-Octal Compare and Dump</td>
</tr>
<tr>
<td>8-624</td>
<td>DUMP and LOAD, TSS/8</td>
</tr>
<tr>
<td>8-667</td>
<td>LABLDP-A TSS/8 Tape Labeling Program</td>
</tr>
<tr>
<td>8-677</td>
<td>STAR PIP</td>
</tr>
<tr>
<td>8-689</td>
<td>UFDSYP-A TSS/8 Line-Printer UFDP Dump Program</td>
</tr>
<tr>
<td>8-697</td>
<td>DDTSS8, DECape Dump for Time Shared System-8</td>
</tr>
<tr>
<td>8-739</td>
<td>COPY PA</td>
</tr>
<tr>
<td>8-743</td>
<td>FILFIX-TSS/8 File Structure Repairing and Restructuring Program</td>
</tr>
<tr>
<td>8-750</td>
<td>Paper Tape Display</td>
</tr>
<tr>
<td>8-754</td>
<td>NUMBER and REDATE-OS/8 File Utility Programs</td>
</tr>
</tbody>
</table>

### VIII. Display, Graphics

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-622</td>
<td>KV8-I-VTU1 Device Handler</td>
</tr>
<tr>
<td>8-698</td>
<td>TEKLIB, A Series of OS/8 FORTRAN II Callable Routines for the Tektronix 4010</td>
</tr>
<tr>
<td>8-715</td>
<td>FORTRAN IV Graphics Subroutines</td>
</tr>
<tr>
<td>8-766</td>
<td>SIMBA-A PDP-8/E Oscilloscope Symbol Generator</td>
</tr>
<tr>
<td>8-772</td>
<td>OS/8 Compatible VC8-E Handler for Mass Storage Systems</td>
</tr>
<tr>
<td>8-773</td>
<td>Graphics Package for the Tektronix 4010 Under OS/8</td>
</tr>
<tr>
<td>8-783</td>
<td>EDTV-Edit-View on AX08 (LAB-8) for OS/8 Editor Version III</td>
</tr>
<tr>
<td>8-863</td>
<td>TEOC Overlay</td>
</tr>
<tr>
<td>8-878</td>
<td>VT-52 or VT-78 PATTERN GAME</td>
</tr>
<tr>
<td>8-854</td>
<td>FOCAL8-251 “WORD” Character Generation Using FOCAL's FDIS Function</td>
</tr>
<tr>
<td>8-857</td>
<td>OS/8 Utility Package</td>
</tr>
<tr>
<td>8-761</td>
<td>WDATA-Subroutine to Write Absolute Binary Data on SYS-Device</td>
</tr>
<tr>
<td>8-765</td>
<td>DUMPOS-Dumps OS/8 ASCII Files</td>
</tr>
<tr>
<td>8-771</td>
<td>PROGCH-TSS/8 Program Searcher</td>
</tr>
<tr>
<td>8-775</td>
<td>COPIER</td>
</tr>
<tr>
<td>8-780</td>
<td>SPLIT and SPLICE</td>
</tr>
<tr>
<td>8-789</td>
<td>RKCOPY</td>
</tr>
<tr>
<td>8-795</td>
<td>RINROT: A Roll-in, Roll-out Program</td>
</tr>
<tr>
<td>8-815</td>
<td>BINPUN: OS/8 Binary Punch from Core Image Files</td>
</tr>
<tr>
<td>8-820</td>
<td>WIPE: TSS/8 User Directory Cleaner</td>
</tr>
<tr>
<td>8-824</td>
<td>LABL: Legible Leader Handler for OS/8</td>
</tr>
<tr>
<td>8-825</td>
<td>ALPHA.SV: Sort OS/8 Directories</td>
</tr>
<tr>
<td>8-828</td>
<td>OS/8 FORTRAN-IV Routines</td>
</tr>
<tr>
<td>8-831</td>
<td>BLKPSP: OS/8 Transfer Program for Files and Blocks</td>
</tr>
<tr>
<td>8-840</td>
<td>COCAS: Sykes Copy Cassette</td>
</tr>
<tr>
<td>8-845</td>
<td>VIRCOP: OS/8 System Creation and File Copy Utility Programs</td>
</tr>
<tr>
<td>8-848</td>
<td>LPTSNP: A Lineprinter Spooler for the OS/8 &quot;PRINT&quot; CUSP</td>
</tr>
<tr>
<td>8-849</td>
<td>MAG0: A PDP8/E File Based Magtape Utility</td>
</tr>
<tr>
<td>8-850</td>
<td>USR And other Special Purpose Subroutines for OS/8 FORTRAN IV</td>
</tr>
<tr>
<td>8-854</td>
<td>LOG: Log and disk partition assignment program</td>
</tr>
<tr>
<td>8-856</td>
<td>CONVRT: 4K Disk Monitor to PS/8 File Conversion</td>
</tr>
<tr>
<td>8-862</td>
<td>COMPAF: Compare All Files Program</td>
</tr>
<tr>
<td>8-871</td>
<td>U: A Program To Type Out CCL Recollections</td>
</tr>
<tr>
<td>8-879</td>
<td>MTFTP: TM8E Magnetic Tape Package (January 1978)</td>
</tr>
<tr>
<td>8-882</td>
<td>DISEDU-Loading EDUsystem-20 on the 4K Disk Monitor System</td>
</tr>
<tr>
<td>8-99</td>
<td>Paper Tape Message Generator</td>
</tr>
<tr>
<td>8-102</td>
<td>FOCAL8-17 FOCAL: How to Write New Subroutines and Use Internal Functions</td>
</tr>
<tr>
<td>8-129</td>
<td>FOCAL Readable Punch</td>
</tr>
<tr>
<td>8-216</td>
<td>FOCAL8-216 FARRAY, A FNEW for Two Dimensional Arrays in 8K FOCAL</td>
</tr>
<tr>
<td>8-245</td>
<td>Executive and Utility Routines for FOCLX, 1972</td>
</tr>
<tr>
<td>8-248</td>
<td>FOCXTX-Text Input-Output Patch to FOCAL-1969</td>
</tr>
<tr>
<td>8-254</td>
<td>Patch to Allow Computed Line Numbers in FOCAL, 1969</td>
</tr>
<tr>
<td>8-265</td>
<td>LISTAL</td>
</tr>
<tr>
<td>8-281</td>
<td>DRAFO</td>
</tr>
<tr>
<td>8-329</td>
<td>FOCAL Generates Binary Patches and Disassembles Binary Tapes</td>
</tr>
</tbody>
</table>

---

99
### IX. Data Management, Data Manipulation, Sorting

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-595</td>
<td>UPDATE, A Program to Make Corrections to a File Containing Records of Variable Length</td>
</tr>
<tr>
<td>8-732</td>
<td>BAVIRF-A Virtual File UDEF for OS/8 BASIC</td>
</tr>
<tr>
<td>8-850</td>
<td>USR, And other Special Purpose Subroutines for OS/8 FORTRAN IV</td>
</tr>
<tr>
<td>8-859</td>
<td>Information Retrieval Programs</td>
</tr>
<tr>
<td>FOCAL8-180</td>
<td>FOCAL-SORT</td>
</tr>
</tbody>
</table>

### X. Probability, Statistics, Curve-Fitting

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-25</td>
<td>Random Number Generator for the PDP-5/8</td>
</tr>
<tr>
<td>8-143</td>
<td>Fast Fourier Transform Subroutines</td>
</tr>
<tr>
<td>8-446</td>
<td>FFTS-R Patch for Use Without EAE</td>
</tr>
<tr>
<td>8-554</td>
<td>ANOVA and DUNCAN</td>
</tr>
<tr>
<td>8-555</td>
<td>MULTC Multiple Correlation Program</td>
</tr>
<tr>
<td>8-556</td>
<td>CHISQ Chi Square Program</td>
</tr>
<tr>
<td>8-557</td>
<td>CLUSTR Cluster Analysis Program</td>
</tr>
<tr>
<td>8-598</td>
<td>CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program</td>
</tr>
<tr>
<td>8-564</td>
<td>A Statistical System in PS/8</td>
</tr>
<tr>
<td>8-652</td>
<td>Regression Analysis Package</td>
</tr>
<tr>
<td>8-660</td>
<td>STAT-S Routine</td>
</tr>
<tr>
<td>8-661</td>
<td>LESQ, General Non-Linear Least Squares</td>
</tr>
<tr>
<td>8-664</td>
<td>FREQHS-A Subroutine to Generate a Frequency Histogram From Stored Interval Measurements</td>
</tr>
<tr>
<td>8-666</td>
<td>NORDER-A Subroutine to Generate nth Order Histograms from Inter-Event Intervals</td>
</tr>
<tr>
<td>8-673</td>
<td>Random Number Generators for Use With FORTRAN or SABR Programs</td>
</tr>
<tr>
<td>8-680</td>
<td>WLSHTR-A Fast Walsh Transform Subroutine for Real Valued Functions</td>
</tr>
<tr>
<td>8-690</td>
<td>RANDU</td>
</tr>
<tr>
<td>8-704</td>
<td>ANOVI: Analysis of Variance, Unequal N</td>
</tr>
<tr>
<td>8-705</td>
<td>ARNORM: Area Under Normal Curve</td>
</tr>
<tr>
<td>8-707</td>
<td>CRSTAB: Cross Tabulation Program</td>
</tr>
<tr>
<td>8-710</td>
<td>MULTS: Multiple Regression Program</td>
</tr>
<tr>
<td>8-745</td>
<td>LEPL-Linear, Exponential and Power Function Curve Fit</td>
</tr>
<tr>
<td>8-778</td>
<td>PFPCF-Polynomial Function Curve Fitting</td>
</tr>
<tr>
<td>8-793</td>
<td>RANF-A Pseudo-Random Number Generator for OS/8 FORTRAN IV</td>
</tr>
<tr>
<td>8-794</td>
<td>IFAC-A FORTRAN Program for Parameter Estimation</td>
</tr>
<tr>
<td>8-797</td>
<td>LSQPCF: Least Squares Polynomial Curve Fitting Program</td>
</tr>
<tr>
<td>8-802</td>
<td>SSP: Scientific Subroutine Package</td>
</tr>
<tr>
<td>8-867</td>
<td>Random Number Generator</td>
</tr>
<tr>
<td>FOCAL8-1</td>
<td>Pseudo Random Number Generator for use with FORCAL</td>
</tr>
<tr>
<td>FOCAL8-19</td>
<td>Least Squares Fit to an Exponential</td>
</tr>
<tr>
<td>FOCAL8-26</td>
<td>Curve Fitting</td>
</tr>
<tr>
<td>FOCAL8-40</td>
<td>Simple Chi-Square Test</td>
</tr>
<tr>
<td>FOCAL8-61</td>
<td>Least Square Fit to a Polynomial</td>
</tr>
<tr>
<td>FOCAL8-63</td>
<td>CURFIT</td>
</tr>
<tr>
<td>FOCAL8-65</td>
<td>Kruskal-Wallis One Way Analysis of Variance by Ranks</td>
</tr>
<tr>
<td>FOCAL8-66</td>
<td>“QUICK SCAN” Using Scheffe’s Calculation</td>
</tr>
<tr>
<td>FOCAL8-67</td>
<td>T-Test</td>
</tr>
<tr>
<td>FOCAL8-69</td>
<td>Analysis of Variance</td>
</tr>
<tr>
<td>FOCAL8-70</td>
<td>Analysis of Variance Randomized Block “F” Test</td>
</tr>
<tr>
<td>FOCAL8-72</td>
<td>General Linear Least Squares Fit</td>
</tr>
<tr>
<td>FOCAL8-74</td>
<td>Linear Least Squares Fit</td>
</tr>
<tr>
<td>FOCAL8-76</td>
<td>Screening Regression</td>
</tr>
<tr>
<td>FOCAL8-108</td>
<td>Analysis of Variance for Two-Dimensional Material</td>
</tr>
<tr>
<td>FOCAL8-115</td>
<td>Short Programs for Statistical Analysis Using FORCAL</td>
</tr>
<tr>
<td>FOCAL8-117</td>
<td>ED-50</td>
</tr>
</tbody>
</table>

### XI. Scientific and Engineering Applications

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-122A</td>
<td>SNAP: Simplified Numerical Analysis</td>
</tr>
<tr>
<td>8-620</td>
<td>PHA-8 Data Acquisition System</td>
</tr>
<tr>
<td>8-626</td>
<td>Automated Electrooculography</td>
</tr>
<tr>
<td>8-630</td>
<td>Pulmonary Function Laboratory Programs</td>
</tr>
<tr>
<td>8-638</td>
<td>GEOMAS</td>
</tr>
<tr>
<td>8-648</td>
<td>LOGMIN-Logic Minimization Program</td>
</tr>
<tr>
<td>8-650</td>
<td>AMIPED-Automated Medical Interview With Pediatric Data Files</td>
</tr>
<tr>
<td>8-657</td>
<td>Neurophysiological Data Collecting Program</td>
</tr>
<tr>
<td>8-665</td>
<td>INTVAL-A Subroutine to Measure Inte-Event Intervals</td>
</tr>
<tr>
<td>8-669</td>
<td>BIOSLD-Antibiotic Assay Using Latin Square Design</td>
</tr>
<tr>
<td>8-702</td>
<td>COGO-8</td>
</tr>
<tr>
<td>8-708</td>
<td>EMLP: Emory Linear Programming Package</td>
</tr>
<tr>
<td>8-718</td>
<td>NSD-Nominal Standard Dose</td>
</tr>
<tr>
<td>8-724</td>
<td>Computer Catalog System</td>
</tr>
<tr>
<td>8-725</td>
<td>The Pipe Stress Problem on a PDP-8/F</td>
</tr>
<tr>
<td>8-749</td>
<td>UFXA08-A LAB-8 (AX08) Set of User-Defined Functions for OS/8 BASIC</td>
</tr>
<tr>
<td>8-781</td>
<td>DOCRL-A Subroutine to Calculate Polarity-Quanitized Autocorrelagram</td>
</tr>
<tr>
<td>8-794</td>
<td>IFAC-A FORTRAN Program for Parameter Estimation</td>
</tr>
<tr>
<td>8-799</td>
<td>Dose Calculation of Irregular Fields</td>
</tr>
<tr>
<td>8-800</td>
<td>Heat Loss Calculation</td>
</tr>
<tr>
<td>8-806</td>
<td>SACI: Simulation of an Analogue Computer</td>
</tr>
<tr>
<td>8-808</td>
<td>Probability Density Functions of Analogue Signals with the LAB-8 System</td>
</tr>
<tr>
<td>8-813</td>
<td>DIGIFIL: RECURSIVE DIGITAL FILTER</td>
</tr>
</tbody>
</table>
### Category Index

**XII. Hardware Control, Device Handlers**

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-597</td>
<td>N.I.H. OS/8 Package</td>
</tr>
<tr>
<td>8-598</td>
<td>CRT: An OS/8 Handler for Tektronix 611 Storage Scope</td>
</tr>
<tr>
<td>8-618</td>
<td>OS/8 Device Handlers for the 57A Magnetic Tape Control</td>
</tr>
<tr>
<td>8-622</td>
<td>KEV-1-VT01 Device Handler</td>
</tr>
<tr>
<td>8-912</td>
<td>RWDF32</td>
</tr>
<tr>
<td>8-953</td>
<td>MTAPR-8K Magtape Monitor (TR05-A Interface) and 8K FORTRAN I/O</td>
</tr>
<tr>
<td>8-959</td>
<td>VT05 OS/8 Handler</td>
</tr>
<tr>
<td>8-965</td>
<td>INDUMP-Input Dump</td>
</tr>
<tr>
<td>8-976</td>
<td>Teletype Line Printer Emulator Handler for OS/8</td>
</tr>
<tr>
<td>8-726</td>
<td>OS/8 Handler for The Varian Statos 21 Line Printer</td>
</tr>
<tr>
<td>8-741</td>
<td>SD8SY and SD6X-Two Handlers for the TD8E Simple DecTape</td>
</tr>
<tr>
<td>8-724</td>
<td>CLOCK-A Real-Time Clock/Calendar Routine</td>
</tr>
<tr>
<td>8-752</td>
<td>MIG8E2-Monitor of Interruptions Which are Generated by the PDP-8/E Peripherals</td>
</tr>
<tr>
<td>8-975</td>
<td>OS/8 System Output Handlers</td>
</tr>
<tr>
<td>8-758</td>
<td>Super Hardware Bootstrap Code for the TC08/TC01 on an MBE</td>
</tr>
<tr>
<td>8-762</td>
<td>TTYIO-1/0 Routines for Teletype or Similar Terminal</td>
</tr>
<tr>
<td>8-764</td>
<td>List</td>
</tr>
<tr>
<td>8-779</td>
<td>TCS8.PA-OS/8 Version III Device Handler for TC88 Magtape</td>
</tr>
<tr>
<td>8-782</td>
<td>DEVHND-Device Handler for Storage Scope Using AX08 (LAB-8) as Controller</td>
</tr>
<tr>
<td>8-798</td>
<td>OS/8 to RSTS Interface</td>
</tr>
<tr>
<td>8-905</td>
<td>PTPR.PA: RTS Handler Task for High Speed Paper Tape Reader and Punch</td>
</tr>
<tr>
<td>8-812</td>
<td>CASINO: Sykes Cassette Input/Output</td>
</tr>
<tr>
<td>8-818</td>
<td>SYKBOOT</td>
</tr>
<tr>
<td>8-824</td>
<td>LBL: Legible Leader Handler for OS/8</td>
</tr>
<tr>
<td>8-832</td>
<td>IPSLAV: Slave Program, and DB8E Interprocessor Buffer Handler</td>
</tr>
<tr>
<td>8-833</td>
<td>VT50 CURSOR MOVE</td>
</tr>
<tr>
<td>8-843</td>
<td>SDBOOT: A Short Bootstraps for a non-OS/8 Sykes 7100 Floppy Disk System</td>
</tr>
<tr>
<td>8-847</td>
<td>VCRE-TV: HANDLER for a Storage Scope</td>
</tr>
<tr>
<td>8-894</td>
<td>MAG10: A PDP/8/E File Based Magtape Utility</td>
</tr>
<tr>
<td>8-854</td>
<td>LOG: Log and disk partition assignment program</td>
</tr>
<tr>
<td>8-860</td>
<td>Extensions To OS/8 BASIC</td>
</tr>
<tr>
<td>8-866</td>
<td>OS/8 Handler for Tektronix 4406-1 Graphic Terminal As Console Device</td>
</tr>
<tr>
<td>8-869</td>
<td>OS/8 Magtape Handler and Utility</td>
</tr>
<tr>
<td>8-872</td>
<td>Sykes 7100/7200 Programs to Read And Write DEC Format Diskettes</td>
</tr>
<tr>
<td>8-876</td>
<td>OS/8 System Device Handler For Sykes 7250 Floppy Disk</td>
</tr>
<tr>
<td>8-877</td>
<td>OS/8 Non-System Device Handler For Sykes 7250 Floppy Disk</td>
</tr>
<tr>
<td>8-879</td>
<td>MTFOTTP: TM8E Magnetic Tape Package (January 1978)</td>
</tr>
<tr>
<td>8-929</td>
<td>High Speed Punch, High Speed Write, and FRAN Overlays to FOCAL 69</td>
</tr>
<tr>
<td>8-928</td>
<td>TTY PUN-FOCAL Patch to Punch Data on Paper Tape in Format Compatible with the TTY Intercom Terminal to CDC6600 Computer Series</td>
</tr>
<tr>
<td>8-932</td>
<td>CVFCTPG (Centronics Vertical Format Control Paper Tape Generator)</td>
</tr>
<tr>
<td>8-936</td>
<td>UWCIG</td>
</tr>
</tbody>
</table>

### XIII. Games, Demonstrations, Educational Programs

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-861</td>
<td>QUBIC</td>
</tr>
<tr>
<td>8-867</td>
<td>CALCUL</td>
</tr>
</tbody>
</table>

101
**Category Index**

| BASIC8-4 | LIFE |
| BASIC8-6 | Cabrillo Test Grader |
| BASIC8-9 | SELFDRILL-The Sloan Selfdrill Program |
| BASIC8-11 | GOLF |
| BASIC8-12 | FOOTBALL |
| BASIC8-13 | A Programmed Learning Course in Boolean Algebra |
| BASIC8-14 | EMLP: Emory Linear Programming Package |
| BASIC8-15 | The Business Management Laboratory |
| BASIC8-16 | SELFDR-The Selfdrill Program, 8K Version |
| BASIC8-17 | MUSIC: PDP-8 Music Playing Program |
| BASIC8-18 | CHEKMO II: Chess Playing Program |
| BASIC8-19 | SNOBOL 8.2 Demonstration Programs |
| BASIC8-20 | VT-52 or VT-78 PATTERN GAME |

| BASIC8-21 | MATHEMATICS-SET 1 |
| BASIC8-22 | PHYSICS-SET 1 |
| BASIC8-23 | PHYSICS-SET 2 |
| BASIC8-24 | CHEMISTRY-SET 1 |
| BASIC8-25 | CHEMISTRY-SET 2 |
| FOCALS-8 | The Sumer Game |
| FOCALS-9 | Hexapawn |
| FOCALS-10 | BIOLOGY-SET 1 |
| FOCALS-11 | EARTH SCIENCE-SET 1 |
| FOCALS-12 | BUSINESS AND SOCIAL STUDIES-SET 1 |
| FOCALS-13 | ADMINISTRATIVE-SET 1 |
| FOCALS-14 | ADMINISTRATIVE-SET 1 |
| FOCALS-15 | BUSINESS AND SOCIAL STUDIES-SET 2 |
| FOCALS-16 | GAMES-SET 1 |
| FOCALS-17 | KRIEGSPIEL |
| FOCALS-18 | POKER |
| FOCALS-19 | MISCELLANEOUS-SET 1 |
| FOCALS-20 | GAMES-SET 2 |
| FOCALS-21 | THE MONOPOLY GAME |
| FOCALS-22 | BASEBALL |
| FOCALS-23 | SIMCOM |
| FOCALS-24 | TRAN |
| FOCALS-25 | LABEL |
| FOCALS-26 | LIB17-Package of Mathematical Routines |
| FOCALS-27 | Multiple Choice Quiz |
| FOCALS-28 | Mathematics-Set 4 |
| FOCALS-29 | GAMES-SET 3 |
| FOCALS-30 | LIB12-Mathematical and Graphing Routines |
| FOCALS-31 | Mathematics-Set 5 |
| FOCALS-32 | Mathematics-Set 6 |
| FOCALS-33 | SEQ; SAME; STAT1 |
| FOCALS-34 | Football Scouting Report Systems |
| FOCALS-35 | XYPLOT; 3DGRAPH; PLOT-1 |
| FOCALS-36 | LODICE |
| FOCALS-37 | Business and Social Studies-Set 3 |
| FOCALS-38 | USAGE |

| BASIC8-39 | LILAC: Laband's Ingenous Little Automatic Computer Laband's |
| BASIC8-40 | USAGE |

| BASIC8-41 | Tutorial Exercises in Chemistry |
| BASIC8-42 | RECOVE-BASIC RECOVERY FROM CRASH |
| BASIC8-43 | NEOFAL, PAL-D SIMULATOR |
| BASIC8-44 | LIB9: Extended Precision Routines for BASIC |
| BASIC8-45 | HORSE-TSS/8 HORSEACING PROGRAM |
| BASIC8-46 | FILE-Text Data File Program for TSS/8 BASIC-4 |
| BASIC8-47 | STF and STM, Stellar Formation and Stellar Model |
| BASIC8-48 | GASSER |
| BASIC8-49 | CSHHS BASIC-73 |
| BASIC8-50 | POSTER, SIGNS |
| BASIC8-51 | ACEDUC, TICTACTOE, CHECK6C, ONEARM |
| BASIC8-52 | NLYSIS, POSTER2, CNLDRS, PIDART |
| BASIC8-53 | BASIC COMPUTER GAMES |
| BASIC8-54 | WORDSEG, WRDGES, LIFE, LIFESI, TICTAC |
| BASIC8-55 | Bowling League Tabulator |

| BASIC8-56 | NANCY.BA |
| BASIC8-57 | MAMII and MAMID |
| BASIC8-58 | NAMES |
| BASIC8-59 | Butler Area School District Computer Mathematics Series |
| BASIC8-60 | CLILAC, LILAC Conversion |
| BASIC8-61 | CHESS |
| BASIC8-62 | PISTOL-Practically Instantaneous Scheduling |
| BASIC8-63 | CAL-Text Data File Program for Individualized Data |
| BASIC8-64 | GASSER |
| BASIC8-65 | MADMAZ Maze Generator |
| BASIC8-66 | SCRAMBLE Word Generator |
| BASIC8-67 | HOCKEY |
| BASIC8-68 | BATTLE OF NUMBERS Game |
| BASIC8-69 | Collection of Math and Demonstration Programs |
| BASIC8-70 | CARD: Simplified Machine Language Simulator |
| BASIC8-71 | QCHESS: Quigley's Algebraic Chess Program |
| BASIC8-72 | FRAN THE BARMAID |
| BASIC8-73 | The Hangman Game |
| BASIC8-74 | A System for Production of Problem Sets with Individualized Data |
| BASIC8-75 | Golf Program |
| BASIC8-76 | Blackjack |
| BASIC8-77 | MARX: A Grading Program |
| BASIC8-78 | RACK-O |
| BASIC8-79 | The Carnival Game |
| BASIC8-80 | FOCAL Lunar Landing Simulation (APOLLO) |
| BASIC8-81 | Gas Law Programs |
| BASIC8-82 | 3 Dimensional TIC TAC TOE (3x 3x 3) |
| BASIC8-83 | FILE-Text Data File Program for TSS/8 BASIC-4 |
| BASIC8-84 | "HORSERACE" |
| BASIC8-85 | TEACH |
| BASIC8-86 | The Towers of Hanoi |
| BASIC8-87 | NIM |
| BASIC8-88 | Battle of Numbers Game (Newberry College Version) |
| BASIC8-89 | TIC-TAC-TOE (FOCAL) |
| BASIC8-90 | CHEMS LAB 5 |
| BASIC8-91 | Play Golf With Arnold Palmer |
| BASIC8-92 | Charge Account |
| BASIC8-93 | FOCAL-SLOT |
| BASIC8-94 | 1-20 Counting Game |
| BASIC8-95 | Zeller's Congruence/Day of the Week |
| BASIC8-96 | Checkers |
| BASIC8-97 | Blackjack for FOCAL |
| BASIC8-98 | Mileage Program |
| BASIC8-99 | Wilmot Grading Program |
| BASIC8-100 | One-Armed Bandit-PDP-8 Style |
| BASIC8-101 | FOCAL Version of the GE Basic Artillery Game |
| BASIC8-102 | APOLLO II |
| BASIC8-103 | LIFE |
| BASIC8-104 | SUMER (French) |
| BASIC8-105 | Self-Teaching Program for FOCAL |
| BASIC8-106 | Stock Market Game |
| BASIC8-107 | Science Fiction Quiz |
| BASIC8-108 | HANGMAN IV |
| BASIC8-109 | Undeatable FOCAL TIC-TAC-TOE |
FOCAL8-257 LIMERICK GENERATOR; RANDOM SENTENCE GENERATOR; LIFE SPAN SIMULATION PROGRAM
FOCAL8-267 Blackjack for FOCAL, 1969
FOCAL8-270 Monopoly
FOCAL8-286 Arithmetic Practice
FOCAL8-295 ATTND–Monthly Attendance Reporting Module
FOCAL8-300 Computer Bowl
FOCAL8-302 XSTOCK–Stockmarket Simulation Game
FOCAL8-303 STKMKT–Stock Market Game
FOCAL8-304 TIC-TAC-TOE
FOCAL8-305 RUBEN
FOCAL8-306 BASEBALL
FOCAL8-307 Casino, Demos, Bombing Mission, Dougle Hangman
FOCAL8-309 DBCONV, Decimal-Binary Converter
FOCAL8-316 BANCPO–Bank Portfolio Simulation
FOCAL8-317 UFO-24-A Dynamics Simulation Game
FOCAL8-331 Knight's Tour

XIV. Plotting Subroutines and Programs

8-629 Graphing Subroutines for 8K FORTRAN Programs
8-670 Plotting Package for OS/8 FORTRAN IV
8-713 Plotting Subroutines for OS/8 FORTRAN II
8-715 FORTRAN IV Graphics Subroutines
8-816 PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
BASIC8-75 SINCOS–SIN and COS Functions Graphing Program
BASIC8-84 PLOTTY–A Program to Plot a Function On a Teletype
FOCAL8-54 Channel Information and Inverted Histogram Plot
FOCAL8-82 Physical Sine Curve Programs
FOCAL8-97 Multiple Equation Graphing on a Teletype
FOCAL8-126 PLOTTER
FOCAL8-176 Program for Producing Histograms from Clinical Data on Teletype
FOCAL8-195 All Purpose Graphing Program
FOCAL8-203 Graph Sketching
FOCAL8-230 CALCOMP Plotter FNEW PLOTX
FOCAL8-285 Online Graph–With Self Determining Scale Factor

XV. Business, Administrative Applications
8-610 INVENT-8
8-686 Bowling League Results, Standings and Averages
8-703 AMORT: Incremental Amortization Schedule
8-708 EMLP: Emory Linear Programming Package
8-709 FINCA: A Computer Program for Financial Statement Analysis
8-738 The Business Management Laboratory
FOCAL8-184 Manpower
FOCAL8-225 Loan Amortization Schedule
FOCAL8-234 Action Indicator Calculator
FOCAL8-237 Bond Computations
FOCAL8-249 Payroll Listings and Totals
FOCAL8-282 CONVRT–Dollars to Deutsch Marks and Deutsch Marks to Dollars
FOCAL8-299 FOPAY–Weekly Payroll Deductions and Computations
FOCAL8-316 BANCPO–Bank Portfolio Simulation

XVI. Maintenance, Hardware Diagnostics
8-735 DSP8; Diagnostic Support Package for the PDP-8
8-744 TSTCDR–TSS/8 Card Reader Diagnostic
8-763 KLSTK–KL8/E, KLA/4 Diagnostic

XVII. Miscellaneous
8-602A The PDP-8 Cookbook, Volume 1
8-602B PDP-8 Cookbook, Volume 2
8-733 RJE System for PDP-8/E (IBM 2780 Emulator)
8-792 PROVE–8, V.03
8-798 OS/8 to RSTS Interface
8-801 MORSE: Morse Code Coder and Decoder
8-827 DDCMP: Half-Duplex Subset of Digital Data Communications Message Protocol
8-832 IPSLAV: Slave Program, and DBSE Interprocessor Buffer Handler
8-873 RSTS Terminal Monitor On A PDP-8
8-874 Serial Input/Output Handlers For Interprocessor Communications
BASIC8-67 TSSTLK–BASIC Language Communications Package for the TSS/8
### Section 4.3
### OPERATING SYSTEM INDEX

#### Operating Systems

<table>
<thead>
<tr>
<th>System Name</th>
<th>Version</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4K Disk Monitor System</td>
<td>OS/8</td>
<td>Paper Tape</td>
</tr>
<tr>
<td>COS-300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDUsystem-20/25/30</td>
<td></td>
<td>TSS/8</td>
</tr>
</tbody>
</table>

#### 4K Disk Monitor System

- 8-604 GET Command for the Disk/DECtape Monitor System
- 8-621 Gray Code Conversion Package
- 8-657 Neurophysiological Data Collecting Program
- 8-806 SAC8: Simulation of an Analogue Computer
- 8-BASIC8-31 DISEDU: Loading EDUsystem-20 on the 4K Disk Monitor System

#### COS-300

- 8-686 Bowling League Results, Standings and Averages
- 8-687 GOLF
- 8-688 FOOTBALL

#### EDUsystem-20/25/30

- 8-BASIC8-23 SIMCOM
- 8-BASIC8-34 Football Scouting Report Systems
- 8-BASIC8-38 USAGE
- 8-BASIC8-49 GASSER
- 8-BASIC8-53 ACEDUC, TICTACTOE, CHECK6C, ONEARM
- 8-BASIC8-54 NLYSIS, POSTER2, CLNDR5, PIDART
- 8-BASIC8-74 PING-PONG
- 8-BASIC8-66 CLILAC, LILAC Conversion
- 8-BASIC8-69 CHESS
- 8-BASIC8-73 POSTER
- 8-BASIC8-77 STREK–STAR TREK
- 8-BASIC8-83 PLTPKG: Mathematical TTY Plotting Package
- 8-BASIC8-90 Math and Simulation Programs for Educational Use
- 8-BASIC8-92 Symbolic Editor Program
- 8-BASIC8-94 Scrambled Word Generator
- 8-BASIC8-95 MADMAZ Maze Generator
- 8-BASIC8-96 Paper Tape Message Generator

#### OS/8

- 8-497 8BAL PDP-8 Macro Language, Version 4
- 8-530 8BALIB Macro Library Generator
- 8-538 Integer IOH for FORTRAN Library
- 8-554 ANOVA and DUNCAN
- 8-555 MULTC Multiple Correlation Program
- 8-556 CHISQ Chi Square Program
- 8-557 CLUSTR: Cluster Analysis Program
- 8-558 CORREL Correlation Program and PCOMP-VARMX Factor Analysis Program
- 8-564 A Statistical System in PS/8
- 8-570 BIN4SV

#### Additional Software

- UPDATE: A Program to Make Corrections to a File Containing Records of Variable Length
- N.I.H. OS/8 Package
- CRT: An OS/8 Handler for Tektronix 611 Storage Scope
- DIBILD: Directory Rebuilder for PS/8 or OS/8
- EXP1P: Extensions PIP
- PDV-8 Cookbook, Volume 2
- PIP11 DOS-11 Format DECtape Utility
- CALCUI
- FUTIL: OS/8 File Utility
- OCOMP: Octal Compare and Dump
- INVENT-8
- FTMULT: EAE Multiplication for 8K FORTRAN
- OS/8 Device Handlers for the 57A Magnetic Tape Control
- KV8/1–VT01 Device Handler
- Floating Integer Functions for use with 8K FORTRAN
- LISP 1.5 Interpreter for PDP-8 with OS/8
- Graphing Subroutines for 8K FORTRAN Programs
- Pulmonary Function Laboratory Programs
- MINT: Multiple Precision Integer Arithmetic Subroutine
- RWDF32
- MAC8: 8K MACRO ASSEMBLER
- PAL12D
- GEOMAS
- OS/8 EDIT PLUS
- OS/8 FORMAT
- LIFE
- AMPED: Automated Medical Interview With Pediatric Data Files
- VT05 OS/8 Handler
- STAT
- LESQ: General Non-Linear Least Squares
- Plotting Package for OS/8 FORTRAN IV
- Random Number Generators for Use With FORTRAN or SABR Programs
- STAR PIP
- RANDU
- OLEVX AND OLEVAX: 4-Channel Averager and Analysis System
- Teletype Line Printer Emulator Handler for OS/8
- TEKLIB: A Series of OS/8 FORTRAN II Callable Subroutines for the Tektronix 4010
- COGO-8
- AMORT: Incremental Amortization Schedule
- ANOVA: Analysis of Variance, Unequal N
- CRSTAB: Cross Tabulation Program
- EMLP: Emory Linear Programming Package
- FINCA: A Computer Program for Financial Statement Analysis
- MULPS: Multiple Regression Program
- Plotting Subroutines for OS/8 FORTRAN II
- FORTRAN IV Graphics Subroutines
- F4EAE: EAE OVERLAY FOR FRTS
- NSD: Nominal Standard Dose
Operating System Index

8-719 OS/8 Software for a TC58 Magtape Control 8-841 CHRFSB: FORTRAN II ASCII Character Subroutine (File name CHRFSB)
8-723 COMP. FT: Function Compare 8-842 DIRECT: OS/8 Directory Listing Program
8-724 Computer Catalog System 8-844 FLIST: OS/8 FORTRAN IV: Listings without Re-compiling
8-726 OS/8 Handler for the Varian Statos 21 Line Printer 8-845 VIRCOP: OS/8 System Creation and File Copy Utility Programs
8-731 MEMO IV 8-847 VCS-E-TV: HANDLER for a Storage Scope
8-732 BAVIRF: A Virtual File UDEF for OS/8 BASIC 8-848 LPTSPL: A Lineprinter Spooler for the OS/8 "PRINT" CUSP
8-734 Microprocessor Language Assembler for OS/8 8-849 MAG10: A PDP8/E File Based Magtape Utility
8-735 DSPS8: Diagnostic Support Package for the PDP-8 8-850 USER And other Special Purpose Subroutines for OS/8 FORTRAN IV
8-738 The Business Management Laboratory 8-852 FORTRAIN II Library Subroutines
8-739 COPY.PA 8-854 LOG: Log and disk partition assignment program
8-741 SD8SY and SD8X: Two Handlers for the TD8E 8-856 CONVRT: 4K Disk Monitor to FS/8 File Conversion
Simple DECtape 8-857 Semi-Automatic Braille Embosser
8-745 LEP: Linear, Exponential and Power Function Curve Fit 8-859 Information Retrieval Programs
8-746 Device Handler for Tektronix 611 Storage Scope 8-860 Extensions To OS/8 BASIC
8-747 STAGE2 Macro Processor 8-861 Mass Spectrometer Functions for OS/8 BASIC
8-749 UFAX08: A LAB-8 (AX08) Set of User-Defined-Functions for OS/8 BASIC
8-751 FORTRAN IV for OS/8 FORTRAN II Users 8-862 COMPAF: Compare All Files Program
8-753 OS/8 System Output Handlers 8-863 TECO Overlay
8-754 NUMBER and REDATE-OS/8 File Utility Programs 8-864 SNOBOL 8.2 Compiler
8-756 ASCON: ASCII File Converter 8-865 SNOBOL 8.2 Demonstration Programs
8-757 OS/8 Utility Package 8-866 OS/8 Handler for Tektronix 4406-1 Graphic Terminal As Console Device
8-759 USLIBA: FORTRAN II Subroutines for Binary Data Transfer 8-867 OS/8 Magtape Handler and Utility
8-760 FASTAD: User Oriented Data Collection on One A/DC Channel 8-871 U, A Program To Type Out CCL Recollections
8-761 WDATA: Subroutine to Write Absolute Binary Data on SYS-Device 8-872 Sykes 7100/7200 Programs to Read And Write DEC Format Disks
8-764 LIST 8-873 RSTS Terminal Monitor On A PDP-8
8-765 DUMPOS: Dumps OS/8 ASCII Files 8-876 OS/8 System Device Handler For Sykes 7250 Floppy Disk
8-772 OS/8 Compatible VC8-E Handler for Mass Storage Systems 8-877 OS/8 Non-System Device Handler For Sykes 7250 Floppy Disk
8-773 Graphics Package for the Tektronix 4010 Under OS/8 8-878 VT-52 or VT-78 PATTERN GAME
8-777 PFC: Polynomial Function Curve Fitting 8-879 MTFOTF: TM8E Magnetic Tape Package
8-779 TC58.PA: OS/8 Version III Device Handler for TC58 Magtape 8-880 RUNOFF V.6
8-780 SPLIT and SPLICE 8-881 BASIC8-41
8-782 DEVHND: Device Handler for Storage Scope Using AX08 (LAB-8) as Controller 8-882 OMSI30 BASIC
8-783 EDTV: Edit-With-View on AX08 (LAB-8) for OS/8 Editor Version III 8-883 BASIC8-56
8-789 RKCOPY 8-884 Laboratory and Display Instructions for OS/8 BASIC
8-793 RANF: A Pseudo-Random Number Generator for OS/8 FORTRAN IV 8-885 NANCY.BA
8-794 IFAC: A FORTRAN Program for Parameter Estimation 8-886 BASIC8-62
8-795 RINROT: A Roll-in, Roll-out Program 8-887 CALC
8-797 OS/8 to RSTS Interface 8-888 BASICE-72
8-799 Dose Calculation of Irregular Fields 8-889 Great Circle Course and Distance
8-802 SSP: Scientific Subroutine Package 8-891 BASICE-91
8-803 EDFMT 8-892 BASIC9-98
8-814 PROCES: An Image Processing Program for the PDP-8E 8-893 Compass Deviation
8-821 BINPUN: OS/8 Binary Punch from Core Image Files 8-894 BASIC8-103
8-826 PLOT, KPLOT: FORTRAN Callable Plotting Subroutines for Scope and Incremental Plotter
8-828 SYKBOOT 8-895 LISTAL
8-831 PAL 8 x 2
8-834 DDTG: Real Time Picture Processor Monitor--Debugger
8-837 LABEL: Legible Leader Handler for OS/8
8-838 ALPHASV: Sort OS/8 Directories
8-842 Program System to Analyze Analogue Signals with the LAB-8 System
8-845 OS/8 FORTRAN-IV Routines
8-848 BLKIPP: OS/8 Transfer Program for Files and Blocks
8-851 IPSSL: Slave Program, and DB8E Interprocessor Buffer Handler
8-858 VT50 CURSOR MOVE
8-861 LIB8X: FORTRAN II EAE Library
8-864 Fast Fourier Transform Subroutines
8-869 Disassembler with Symbols
8-871 A Program to Relocate and Pack Programs in Binary Format
8-872 One Pass PAL-III
8-873 XOD: Extended Octal Debugging Program
8-874 LIST Interpreter for the PDP-8
8-875 SNAP: Simplified Numerical Analysis
8-876 SNAP: Simplified Numerical Analysis for use with EAE
8-878 XDDT Extended Octal-Symbolic Debugging Program
8-879

Paper Tape

8-18
8-32
8-84
8-89
8-102
8-122A
8-127
8-143
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-178</td>
<td>Reverse Assembler</td>
<td>8-822</td>
<td>CHEKMO II: Chess Playing Program</td>
</tr>
<tr>
<td>8-179</td>
<td>Disassembler with Symbols, Modifications for use without EAE</td>
<td>8-827</td>
<td>DDCMP: Half-Duplex Subset of Digital Data Communications Message Protocol</td>
</tr>
<tr>
<td>8-213</td>
<td>ALGOL (4K Version)</td>
<td>8-829</td>
<td>Improved Mini-Debugging Technique</td>
</tr>
<tr>
<td>8-261</td>
<td>QUBIC</td>
<td>8-837</td>
<td>QUICKPOINT-8: Numerical Control System</td>
</tr>
<tr>
<td>8-335</td>
<td>COLPAC</td>
<td>8-875</td>
<td>CRS80: 8080 Cross-Assembler</td>
</tr>
<tr>
<td>8-400</td>
<td>Execute Slow</td>
<td>BASICS-100</td>
<td>Bowling Record Tabulator</td>
</tr>
<tr>
<td>8-446</td>
<td>FTTS-R Patch for Use Without EAE</td>
<td>FOCAL8-1</td>
<td>Pseudo Random Number Generator for use with FOCAL</td>
</tr>
<tr>
<td>8-527</td>
<td>XDDTSE</td>
<td>FOCAL8-17</td>
<td>FOCAL: How to Write New Subroutines and Use Internal Functions</td>
</tr>
<tr>
<td>8-594</td>
<td>FP8: Floating Point Arithmetic Software for DEC PDP-8 Series Computers</td>
<td>FOCAL8-52</td>
<td>FOCAL5/69</td>
</tr>
<tr>
<td>8-602A</td>
<td>The PDP-8 Cookbook, Volume 1</td>
<td>FOCAL8-135</td>
<td>MODV-Choice</td>
</tr>
<tr>
<td>8-605</td>
<td>ADUMP8</td>
<td>FOCAL8-227</td>
<td>FOCL/F: An Extended Version of 8K FOCAL/69</td>
</tr>
<tr>
<td>8-611</td>
<td>SLED: Source and Listing Editor</td>
<td>FOCAL8-284</td>
<td>8/E EAE Routine for FOCAL</td>
</tr>
<tr>
<td>8-623</td>
<td>PAGER</td>
<td>FOCAL8-319</td>
<td>FOCLAB: A Language for Computer Controlled Psychology</td>
</tr>
<tr>
<td>8-627</td>
<td>TEXPAK: Program to Convert a Line of Text to Packed Octal Format</td>
<td>FOCAL8-329</td>
<td>FOCAL Generates Binary Patches and Disassembles Binary Tapes</td>
</tr>
<tr>
<td>8-636</td>
<td>BEST: Binary to Symbolic Traductor</td>
<td>TSS/8</td>
<td>DUMP and LOAD, TSS/8</td>
</tr>
<tr>
<td>8-652</td>
<td>Regression Analysis Package</td>
<td>8-624</td>
<td>LABELDP: A TSS/8 Tape Labeling Program</td>
</tr>
<tr>
<td>8-654</td>
<td>Cabrillo Test Grader</td>
<td>8-667</td>
<td>MAPPER</td>
</tr>
<tr>
<td>8-655</td>
<td>CINET-BASIC</td>
<td>8-679</td>
<td>CASE: Carleton Symbolic Editor</td>
</tr>
<tr>
<td>8-656</td>
<td>SELFDRL: The Sloan Selfdrill Program</td>
<td>8-681</td>
<td>BNLOAD, TSS/8 Binary Loader</td>
</tr>
<tr>
<td>8-658</td>
<td>Extended Double Precision Interpretive Package</td>
<td>8-683</td>
<td>UFD: A TSS/8 Line-Printer UFD Dump Program</td>
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<td>Undefined Symbol List for MACRO-8</td>
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<td>A Programmed Learning Course in Boolean Algebra</td>
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<td>8-663</td>
<td>REPRD: Read, Punch and Verify Product</td>
<td>8-693</td>
<td>DDTSSS: DECtape Dump for Time Shared System-8</td>
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<td>8-664</td>
<td>FREQHS: A Subroutine to Generate a Frequency Histogram From Stored Interval Measurements</td>
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<td>FILFIX: TSS/8 File Structure Repairing and Restructuring Program</td>
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<td>8-665</td>
<td>INTVAL: A Subroutine to Measure Inter-Event Intervals</td>
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<td>TSTCDR: TSS/8 Card Reader Diagnostic</td>
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<td>8-666</td>
<td>NORDER: A Subroutine to Generate nth Order Histograms from Inter-Event Intervals</td>
<td>8-771</td>
<td>PROSCH: TSS/8 Program Searcher</td>
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<td>8-668</td>
<td>RAW: A Reverse Assembler of Windsor</td>
<td>8-784</td>
<td>TSS/8 TTRACE and TSS/8 LTRACE</td>
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<td>8-669</td>
<td>BIOISSL: Antibiotic Assay Using Latin Square Design</td>
<td>8-785</td>
<td>GPATCH</td>
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<td>8-672</td>
<td>XCB and XBIN Loader</td>
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<td>TSS/8 FORMAT</td>
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<td>MACRO-8 Patch to Move DELETE Routine</td>
<td>8-802</td>
<td>WIPE: TSS/8 User Directory Cleaner</td>
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<td>8-680</td>
<td>WLSHTR: A Fast Walsh Transform Subroutine for Real Valued Functions</td>
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<td>THE MONOPOLY GAME</td>
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<td>IJPA: Injection Patcher</td>
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<td>The Pipe Stress Problem on a PDP-8/F</td>
<td>BASICS-25</td>
<td>LABEL</td>
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<td>MEND</td>
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<td>Multiple Choice Quiz</td>
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<td>BASICS-46</td>
<td>HORSE: TSS/8 HORSERACING PROGRAM</td>
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<td>RJE System for PDP-8/E (IBM 2780 Emulator)</td>
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<td>FILE: Text Data File Program for TSS/8 BASICS-4</td>
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<td>Paper Tape Reader-Printer</td>
<td>BASICS-58</td>
<td>RESEQUENCE (A revision of DECUS8-402)</td>
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<td>Theorem Prover for the Propositional Calculus</td>
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<td>Butler Area School District Computer Mathematics Series</td>
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<td>Paper Tape Display</td>
<td>BASICS-67</td>
<td>TSSTLK: BASIC Language Communications Package for the TSS/8</td>
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<td>8-768</td>
<td>EDAS: Editing and Assembling System</td>
<td>BASICS-70</td>
<td>PISTOL: Practically Instantaneous Scheduling Typed On-Line</td>
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<td>SELFDR: The Selfdrill Program, 8K Version</td>
<td>BASICS-102</td>
<td>Collection of Math and Demonstration Programs</td>
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<td>Simple ASCII Editor and Tape Reproducer</td>
<td>FOCAL8-291</td>
<td>DRANO</td>
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</tbody>
</table>
CHAPTER 1. OFFICES

Australia/NZ:
DECUS Australia
P.O. Box 491
Crows Nest, N.S.W. 2065
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Switzerland

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Marlboro, MA 01752
U.S.A.