

DECUS



PROGRAM LIBRARY PDP-11 CATALOG CATALOG

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
AUGUST 1978

DECUS PROGRAM LIBRARY

PDP-11 CATALOG



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
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This is a complete PDP-11 DECUS Library CATALOG. It includes a complete listing of PDP-11 and RSTS/E DECUS programs.

| | |
|--------------------------------|----------------|
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| DEC | DIGITAL | OMNIBUS | TYPESET-11 |
| DECCOMM | EDUSYSTEM | OS-8 | UNIBUS |
| DECsystem-10 | FLIP CHIP | PDP | |
| DECsystem-20 | FOCAL | PHA | |

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Section 1

General Information

Section 1

General Information

1.1 How to Use this Catalog

This catalog is divided into four sections:

- 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 two parts, PDP-11 and RSTS-11. Each include 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 "RSTS-11-123" or "PDP-11-23."
- Section 3, *Standards*, lists and describes all the 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.)

1.1.1 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.
- Editor's Note: The following DECUS programs have been added since the last version of the PDP-11 Catalog:

DECUS 11-330 thru 11-362

RSTS 11-108 thru RSTS 11-115

- DECUS is pleased to bring to the attention of our RSTS/E users that most RSTS-11 programs are now available on RK05 disk. Also, documentation for RSTS-11 programs for abstracts 1 thru 93 are now available on Microfiche (see last page of section 2.2 for ordering information).
- In addition, the following programs have been updated since the last version:

- | | |
|--------|---------------------------------------|
| 11-221 | RT-11 ODT with TRACE Feature Added. |
| 11-226 | RO.MAC-MT ROLLIN File Device Driver |
| 11-229 | INDEX-FORTRAN Cross Referencing |
| 11-282 | M.I.T. Garbage Collection #1 |
| 11-283 | M.I.T. Garbage Collection #2 |
| 11-284 | RSX-11 FOCAL |
| 11-287 | M.I.T. Magtape Cornucopia for RSX-11D |
| 11-288 | TECO V28 for RT-11 |

1.2 DECUS Contacts

1.2.1 United States and Canada

To obtain information and to place Library orders, 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-11 DECUS Library, contact the PDP-11 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, contact:

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

1.2.2 Outside the U.S. 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:

Australia:

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

Europe and Middle East:

DECUS Europe
12, avenue des Morgines
C.P. 510, 1213 Petit-Lancy 1
Geneva, Switzerland
Telephone (022) - 93-33-11

1.3 Payment

All DECUS service charges are to defray the cost of media, reproduction, handling, and postage. All orders must be accompanied by check, DECUS coupons, or a purchase order. PLEASE DO NOT SEND CASH THROUGH THE MAIL. Please make purchase orders and checks payable to DECUS. DECUS order processing and accounting functions are completely separate from Digital Equipment 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 charges quoted in this catalog are in U.S. Dollars. A \$2.00 invoice charge is added to all orders that are not prepaid. (This is subject to change without notice.)

Users outside the United States and Canada should make payment in local currency and forward 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 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 circumstances.

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. However, if the cost of the "A" or "D" coded document exceeds 15% of the media service charge, the service charge for the corresponding tape or disk will be increased to reflect the cost of the documentation.

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 documentation price code that accompanies the abstract will apply.

1.7 Media

Media on which specific programs are available is indicated by the first letter of the media/price code in the Abstract Section of this Catalog.

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

1.7.1 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.

Prices quoted in this catalog will be valid until 1 July 1979, unless, due to extreme circumstances, DECUS must adjust them prior to this date. Changes in pricing or availability may occur at any time. Please consult DECUSCOPE and the various newsletters for changes in Library information, pricing, and policy.

Documentation on Media, if listed with an abstract, indicates that the documentation is included with the program on the media.

MEDIA CODES

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

1.8 Program Distribution Methods

Programs in the DECUS PDP-11 Library may be obtained:

- As individual programs on DECTape, paper tape, or floppy diskette. Only those programs specified as available on DECTape may be obtained on DECTape. If you would like to see specific DECUS programs made available on other media we need your assistance. If a program is not specified as available on the media you require, please contact the DECUS Library before ordering to confirm whether DECUS can or cannot copy the program onto the media you require.
- As library tapes which are complete segments of the Library packed onto magnetic media. For availability of Library packages, see Section 2.2, pages 69 and 70.

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

DECUS will not accept returned tapes for credit or exchange; therefore, it is important that the correct media requirements be specified at the time the order is placed. For further information, please refer to the Return Policy Section of this catalog (Section 1.5).

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. 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 the Cross System Index, order DECUS number 11-999.

Section 2

Abstracts

Section 2.1

PDP-11 ABSTRACTS

11-1—11-10

Recursive Unsigned Radix Print

Author: Stephen D. Piner

Submitted by: Gene E. Sengstock

Canberra Industries, Inc., Meriden, CT

Source Language: PAL-11A

Memory Required: 4K

Other Software Required: Single Precision Integer Divide (DIVI) and IOX

11-1

It could be adapted to 96 words of ROM to serve as bin loader for all devices. Such an arrangement would require no bootstrap, free additional core space, obtain continual use of the ROM (not just an occasional boot) and when used as an automatic boot, it would get the system back on the air faster.

Media Price Code: A1, G7

Abstract: This subroutine converts unsigned single precision binary numbers to ASCII strings (blank suppressed) in a specified radix. The output routine (PUT) outputs the characters into an IOX compatible buffer. RDXPUS is recursive and requires two (2) words of PDL per character.

Note: Radix must be $2 \leq R \leq 10$

Media Price Code: D1, G5

Single Precision Unsigned Multiply/Divide

Author: Stephen D. Piner

Submitted by: Gene E. Sengstock

Canberra Industries, Inc., Meriden, CT

Source Language: PAL-11A

Memory Required: 4K

Abstract: This package provides routines to perform the following unsigned operations:

1. $AC1 \times AC2 \rightarrow AC0, AC1$
2. $(AC1 \times AC2) + AC0 \rightarrow AC0, AC1$
3. $AC1 + AC2 \rightarrow AC1, R \rightarrow AC0$
4. $(AC0, AC1) + AC2 \rightarrow AC1, R \rightarrow AC0$

Media Price Code: D1, G5

Dice Game for the PDP-11

Author: Paul J. Bezeredi, Jr.

Digital Equipment Corporation, Maynard, MA

Source Language: PAL-11A

Memory Required: 4K

Abstract: This program enables the user to shoot dice using the PDP-11 computer. The program keeps track of all bets and gives a tally of winnings whenever you win or lose.

Restrictions: DEC standard device registers and interrupt vectors are used

Media Price Code: D2, F5

PDP-11 Binary Loader

Author: Richard Merrill

Digital Equipment Corporation, Maynard, MA

Source Language: PAL-11X

Memory Required: 2K

Other Software Required: Bootstrap loader

11-2

Blackjack for FOCAL-11

Author: Richard Merrill

Digital Equipment Corporation, Maynard, MA

Source Language: FOCAL-11

Memory Required: 4K

Abstract: This program deals random Blackjack hands to itself (the dealer) and the user (the player). Utility functions are provided to deal and print card values.

Media Price Code: D1, G5

Dump in Bootstrap Format Binary

11-8

Author: L. N. Daley

University of South Carolina, Columbia, SC

Source Language: PAL-11

Abstract: This program may be used to have any area of core storage punched in bootstrap format. The program is loaded with the bootstrap loader and is located in the area normally occupied by the absolute loader. It is a short routine which may be entered through the console.

Restrictions: Works only with RSTS Version 4

Media Price Code: D1

Slow Matrix Inversion For Real Numbers

11-9

Author: Richard Merrill

Digital Equipment Corporation, Maynard, MA

Source Language: FOCAL-11

Memory Required: 4K

Abstract: This program will invert a matrix up to size 17×17 , of real numbers using modified Gauss-Jordan methods. It uses double subscripts and can only be run on FOCAL-11 and FOCAL-15. It is quite reliable.

Note: This program uses essentially all core not used by the FOCAL operating system

Media Price Code: D1, G5

PDP-11 BASIC Demonstration Package

11-10

Submitted by: Richard Finn

Digital Equipment Corporation, Maynard, MA

Source Language: BASIC-11

Abstract: This package contains a group of demonstration tapes, using the PDP-11 BASIC Assembler. A prior knowledge of the games involved is assumed. The demos are: FOOTBALL, ROCKET, WEEKDAY, CRAPS, CIVIL WAR and SNOOPY. Package contains no documentation, tapes only.

No Write-up Available.

Media Price Code: G10, K27

Format: RT-11

Abstract: This is a modified absolute binary loader which uses the same locations as the old one, starts at the same starting address, has a bug fixed (!) and has a feature added so that it can be used in a device independent way.

11-4

PDP-11 DECTape Copy Routine

Author: William F. Godwin
 Educational Testing Service, Princeton, NJ
Operating System: DOS/BATCH
Source Language: pal-11
Memory Required: 8K
Special Hardware Required: 2 DECTapes

Abstract: This is a DECTape copy routine which operates under the PDP-11 Disk Monitor System. It is useful for generating exact duplicates of DECTapes for backup or distribution.

An initial dialogue establishes the drive numbers for the original and the copy, and allows the user the option of verifying the copy. Information is then transferred, a buffer-load at a time, from the original to the copy. To verify the copy, the routine will reread both the original and the copy after each transfer, and compare the two word-for-word. If an error is found, up to five attempts will be made to recopy and reverify the information before typing an error message. I/O errors will also force five retries before an error message is given. 8K and 12K versions are included on the tape.

Media Price Code: H32
Format: DOS-11

AC Circuit Analysis Program

Author: Steve Hort
Submitted by: Charles H. Conley
 Digital Equipment Corporation, Maynard, MA
Source Language: BASIC
Memory Required: 8K

Abstract: This BASIC program analyzes the AC frequency response of a linear network given specific data concerning circuit elements, which may include: resistors, inductors, capacitors and independent and dependent voltage and current sources.

Media Price Code: A2, G6

ADUMP

Author: Karl H. Lederer
 Digital Equipment Corporation, Anaheim, CA
Source Language: PAL-11A
Special Hardware Required: PC11, HS Reader/Punch

Abstract: This is a utility core dump program. It is coded to be position independent and is designed to function in the Paper Tape System environment. It expects the user to give, on the switch register, the starting address for dumping and the number of words to dump. It provides ASCII as well as octal representation of core.

Note: Load with PTS absolute loader

Media Price Code: A1, G5 (includes F)

Paper Tape Duplicator (High Speed Reader to TTY)

Author: John E. Bowdle
 Goodyear Atomic Corporation, Piketon, OH
Source Language: PAL-11A
Special Hardware Required: High Speed Tape Reader (Digitronics Model 2540 without end-of-tape detector)

Abstract: This utility program is convenient for duplicating paper tape of any format. A block of 200₈ characters is read into memory and duplicated at Teletype rates. Since the Digitronics tape reader does not have an out-of-tape detector, the program sets a time out counter to detect the end of a tape.

Media Price Code: D2, G5 (includes F)

11-11

PDP-11 Datapoint Editor, JPEDIT

11-15

Author: Dr. James E. Parker
 Central Intelligence Agency, Washington, D.C.
Source Language: PAL-11
Memory Required: 8K
Special Hardware Required: Datapoint 3300 Terminal or substitute, Reader/Punch, Line Printer

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

Media Price Code: A1, B4, F5, G14

11-12

FFT11C—A Fast Fourier Transform Subroutine For Complex Data

11-16

Revised: 7 December 1972
Author: Robert Day
 Digital Equipment Corporation, Maynard, MA
Source Language: PAL-11A
Memory used: 2986 words
Special Hardware Required: KE11-A EAE unit

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

11-13

Media Price Code: A2, B2, F5, G10

11-14

TTY Code to Octal

11-17

Author: John E. Bowdle
 Goodyear Atomic Corporation, Piketon, OH
Source Language: PAL-11A
Other Software Required: Absolute Binary Loader

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

Media Price Code: D1, G5 (includes F)

11-19

Core Load to MAINDEC Tape/MAINDEC Tape

11-19

Author: Gary D. Schaal
 Digital Equipment Corporation, Phoenix, AZ
Source Language: PAL-11
Memory Required: 4K
Special Hardware Required: TU56/TC11

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

Media Price Code: D2, F5

Trace for PDP-11 Floating Point Package

Author: William R. Lamb
 Transaction Technology, Cambridge, MA
Source Language: PAL-11

Memory Required: 446 additional locations for the trap handler

Abstract: The trace routine permits the user of floating point operations the option of displaying the results of calls to any subroutines in the floating point package. As each call is made via the modified trap handler, the trace will print (1) the program counter at the point of the call, (2) the destination address (in octal) for the result of the operation and (3) the result itself. The proper conversion routine is automatically selected: E-format for all floating point results, Integer format if fixed point. The trap handler replaces module 9 of the Floating Point Package. (Version V005A)

Media Price Code: A1, F5, G8

**CIOFB/DOS Based Overlay File Builder/Editor
(Version 3)**

Author: J. Eric Pollack
 Department of Oceanography, University of Washington,
 Seattle, WA
Operating System: DOS/BATCH
Source Language: PAL-11
Memory Required: 12100₈ bytes
Special Hardware Required: RF11 disk

Abstract: CIOFB builds and edits files of overlays on DECtape or system disk. It can be used to selectively replace system overlays or create a SYSLOD-like boot tape.

Media Price Code: A1, H32

Format: DOS-11

**DFPEEK/DOS Based Disk Inspect/Patch
Routine**

Author: J. Eric Pollack
 Department of Oceanography, University of Washington,
 Seattle, WA
Operating System: DOS/BATCH
Source Language: PAL-11
Memory Required: 2120₈ words

Abstract: DFPEEK is used to read, display and patch the contents of any block on the DF: device. The contents of the block are displayed in octal, unpacked RAD50 and ASCII. Multiple blocks may be listed on KB:. No provision is made for dumping to LP:.

Media Price Code: A2, H32

Format: DOS-11

**BINFED/DOS Based Binary Module List/Patch
Program**

Author: J. Eric Pollack
 Department of Oceanography, University of Washington,
 Seattle, WA
Operating System: DOS/BATCH
Source Language: PAL-11
Memory Required: 3074₈ words

Abstract: BINFED is used to edit object or load modules created under the PDP-11 PTS or DOS. Binary records are read, displayed and written to an output file. The operator has options of correcting the contents of or inserting records in the output file.

Media Price Code: A2, H32

Format: DOS-11

11-20

DSKSAV/DOS Disk SAVE/RESTORE

Author: Paul Boltwood
 Computing Devices of Canada, Ottawa, Ontario, Canada
Operating System: DOS/BATCH
Source Language: PAL-11R
Memory Required: 8K
Special Hardware Required: RF11 disk, HS Reader/Punch

Abstract: This program runs under DOS to dump all used sectors of the system RF11 disk onto paper tape. It is capable of restoring DOS to disk in about 10 minutes which is much faster than the DEC SYSGEN method for people without DECTape.

Restrictions: Only works for RF11 disk, 1 surface

Media Price Code: B2, F6, G10

11-26

BIOF: BASIC Input/Output Function

Author: Mary D. Cermak
 Case Western Reserve University, Cleveland, OH
Source Language: PAL-11A
Special Hardware Required: HS Reader/Punch

Abstract: This program allows users of BASIC the option of execution time data I/O on the high speed reader and punch. It utilizes BASIC's EXF option, is readily loaded and requires minimal change to present programs. Features include:

1. No limit on number of input tapes
2. Ability to punch leader
3. Variety of allowable delimiters on input
4. Punched output formatted for immediate input.

Media Price Code: A1, G5 (includes F)

11-27

Extended ODT-11X

Author: Willis E. Herr
 System Development Corporation, Santa Monica, CA
Source Language: PAL-11A

Abstract: This program allows, in addition to existing ODT capabilities, the initiation of binary and octal dump via TTY input and also allows any area of core to be initialized to any value, also via TTY input.

Media Price Code: A1, F5, G22

11-28

COPYTAPE

Author: William H. Talbot
 Johns Hopkins University School of Medicine, Baltimore,
 MD
Source Language: PAL-11A
Memory Required: 4K
Other Software Required: IOX
Special Hardware Required: HS Reader/Punch

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

Media Price Code: A1, F5, G5

11-29

Binary Tape Interpreter/Address Scanner

Author: John E. Bowdle
 Goodyear Atomic Corporation, Piketon, OH
Source Language: PAL-11A
Memory Required: 4-36, 600-3230
Special Hardware Required: TTY and optical tape reader with standard addresses

11-31

11-31 (Cont.)

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

Media Price Code: A2, B2, F5, G8

PALEDIT

Author: Thierry Monnerot
IMAG Institut Polytech, Grenoble, France
Source Language: PAL-11
Memory Required: 8K

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

Restrictions: 4K Editor/Assembler features only

No Source Available.

Media Price Code: A2, F10

11-34

COMBINE

Author: Thierry Monnerot
IMAG Institut Polytech, Grenoble, France
Source Language: PAL-11
Memory Required: 2000-3470 plus IOX
Special Hardware Required: ASR33 (PC11 optional)

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

No Source Available.

Media Price Code: F5

11-35

Parity Subroutine

Author: Ray Jones
Digital Equipment Co., Ltd., Reading, England
Source Language: PAL-11
Memory Required: 10 locations
Memory used: 10 Locations
Special Hardware Required: ASR33

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

Media Price Code: D1, G5

11-36

Conway's Game 'LIFE'

Author: Werner Ferch
McGill University, Montreal, Canada
Source Language: FOCAL-11
Memory Required: 4K

Abstract: This program will transform successively an initial pattern and plot the new pattern on the teletype. It uses John Conway's algorithm for the transformation. It uses double subscripts and can only be run on FOCAL-11 and FOCAL-15. To get maximum benefit, the user should read 'Scientific American,' October 1970, Mathematical Games.

Media Price Code: D1, G5

PAL-11A (12K) Card Reader Assembler

11-38

Author: Willis E. Herr
System Development Corporation, Santa Monica, CA
Source Language: PAL-11
Memory Required: 12K
Special Hardware Required: Card Reader

Abstract: The standard PAL-11A (8K) V006A assembler was modified to accept card input (029 punch). A separate tape supplied allows the conversion table to be modified for 026 punched cards. All original features of PAL-11A remain available.

Media Price Code: A1, B14, F10

"SUPER DUPER" (Fast PDP-11 DECTape Duplication Routine)

11-39

Author: Michael Craven
Digital Equipment Corporation, Mountain View, CA
Source Language: PAL-11R
Memory Required: 12000-35742
Special Hardware Required: 8K PDP-11, TC11/TU56 Dual DEC-tape Control/Transport

Abstract: This routine will copy or verify blocks 0 through 1077 from DECTape unit 0 to DECTape unit 1 in approximately two minutes by just following the simple interactive command sequence as directed from the console teletype. Any DECTape errors encountered are fully diagnosed and printed in plain English on the TTY. The routine will then restart with a new command dialogue.

Media Price Code: B3, F5, G10

DSKDMP and MTDUMP

11-40

Author: Barry A. Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA
Source Language: PAL-11R
Memory Required: Minimum 8K
Special Hardware Required: KE11A, DATUM 9 track magtape, LOGOS 132 column line printer, RS/RF11 disk

Abstract: DSKDMP allows the user to transfer any portion of the disk (track addresses only) to the magtape or line printer. It provides an ideal way to create a backup copy of the disk on magtape by transferring all 128 tracks of the disk.

MTDUMP allows the user to transfer a file created by DSKDMP onto the line printer or onto the disk beginning at any track address. It is used to recreate the disk.

Restrictions: Applicable for only one (1) disk platter

Media Price Code: A2, F18, G30

11-37

DECTape Handler

11-41

Author: Dr. Rudolf Albrecht and Dr. Peter B. Boyce
Lowell Observatory, Flagstaff, AZ
Source Language: PAL-11
Memory Required: 400₈ words

Abstract: This program performs block search, WDATA and RDATA functions of the DECTape on interrupt. Reading and writing is done in a forward direction only. Block search is bidirectional. The program has not been checked for relocatability.

Media Price Code: D2, G8

PAL8X (Stand Alone Version 00)

Author: Paul J. Bezeredi, Jr.
 c/o AMBRIEX, S.A., Rio de Janeiro, Brazil
Source Language: MACRO-11
Memory Required: 0-12260

Abstract: PAL8X assembles PDP-8 code on the PDP-11 computer. It is compatible with PS/8, PAL8 and 8K PALD with some extra features added. Provisions for high speed reader/punch and line printer are also included.

The program uses all available memory.

Media Price Code: A2, F5

Electron Spin Resonance and General Integration Program

Author: Paul E. McMahill
 University of Oregon Medical School, Portland, OR
Source Language: PAL-11A
Memory Required: 3328 words including FPP and 1536 words for data
Special Hardware Required: Hewlett-Packard Model 7200A graphic plotter is optional

Abstract: This program integrates electron spin resonance spectra, chromatographic peaks and other data. The corrected original data and the first and second integrals are plotted. The first and second integrals are quantitated. The data can be typed out if a plotter isn't used.

Restrictions: The baselines must be adjustable from the end points

Media Price Code: A1, B2, F5, G8

DLINES

Author: G. Bernstein
 McGill University, Montreal, Canada
Source Language: PAL-11
Memory Required: 1275 words (program) 2067 words (buffer)
Special Hardware Required: 8K PDP-11, RC11 Disk, VR14CRT; KW11-P (program clock) optional

Abstract: Allows user to display any stationary or moving figure on CRT by entering that figure's geometry from the teletype. Figures may be ordinary straight lined objects (squares, triangles, pentagons, etc.) or vector approximations to curvilinear figures.

Media Price Code: A4, H32

Format: DOS-11

Two Conversion Routines EBTASC and ASCTEB

Author: Kenneth Schroeder
 E. R. Squibb and Sons, Inc., New Brunswick, NJ
Source Language: PAL-11A

Abstract: EBTASC is a routine to convert data from IBM EBCDIC format into PDP-11 ASCII format. It is written in relocatable code and must be reassembled with its calling program.

11-42

ASCTEB performs the inverse function of EBTASC. This routine must also be reassembled with its calling program.

As written these routines are written, reassembled and loaded together. They require 1617 Octal Bytes of storage. Their execution time depends on length of the data buffers.

Media Price Code: A1, F5, G6

External Functions for PDP-11 BASIC

Author: Dr. Rudolf Albrecht and Dr. Peter B. Boyce
 Lowell Observatory, Flagstaff, AZ
Source Language: PAL-11
Memory Required: 8K
Other Software Required: BASIC-11

Abstract: A system of 10 external functions for PDP-11 BASIC for driving paper tape reader(s) (reading data in ASCII format), a VT01 storage scope, and the TC-11 DECTape. Deletion of not needed functions is possible.

Media Price Code: A2, B2, G10, K27

Format: RT-11

TRACE Debugging Program

Author: Victor Adomaitis
 Computing Devices of Canada, Ltd., Ottawa, Ontario, Canada
Operating System: DOS/BATCH
Source Language: PAL-11R
Memory Required: 760₁₀ words
Special Hardware Required: LP-11 (optional)

Abstract: This program allows linked object programs to be debugged. Using the ASR33, the user may: (a) examine or alter any core location (b) run all or any portion of the object program (c) dump the contents of all 8 general registers (d) dump any specified area of core. TRACE is compatible with the PDP-11 Disk Operating System (DOS) and may be used under it. The manual for this program assumes familiarity with the Disk Operating System Monitor.

Media Price Code: A2, G12

HELP Bootstrap

Author: Rick Wardrop
 Digital Equipment Corporation, Sunnyvale, CA
Source Language: PAL-11
Memory Required: 0-420

Abstract: This program provides a quicker and more convenient method of loading the bootstrap and absolute loaders.

Media Price Code: D2, F5

UNPAL-11

Author: Patrick H. Stakem
 Fairchild Industries, Germantown, Maryland
Operating System: DOS/BATCH
Source Language: PAL-11
Memory Required: < 5600₈ bytes

Abstract: This program disassembles core-image code produced by PAL-11 and loaded by LINK-11 into Symbolic. Symbolic, with absolute addresses, is listed on the teletype.

Media Price Code: A2, B3, F6

PPMT and DUMPMT

Author: Barry Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA
Source Language: PAL-11r
Memory Required: 4K Minimum
Special Hardware Required: DATUM 9 track magtape, LOGOS 132 column line printer, ASR33, PC-11 high speed paper tape reader

Abstract: PPMT stores ASCII source paper tapes onto the DATUM 9 track magtape. It is ideal for users without the features of a Disk Operating System. These files can then be dumped onto the teletype, high speed punch or line printer using DUMPMT.

DUMPMT dumps files from the magtape generated by PPMT onto the teletype, high speed paper tape punch, or 132 column line printer.

Media Price Code: A1, B3, F10, G14

ODT-11XR

Author: Barry Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA
Source Language: PAL-11
Memory Required: 4K

Abstract: ODT-11XR is a relocatable version of ODR-11X for the PDP-11/20 paper tape system. Using the Absolute Loader, ODT-11XR can be loaded into memory at any location by specifying the desired bottom address in the switch register.

Media Price Code: F5, G18

PDP-11/10 Loader

Author: H. L. Farnsworth and R. B. Fleisher
Eastman Kodak Company, Rochester, NY
Source Language: TECO
Memory Required: PDP-10—2K core; PDP-11—4K core
Special Hardware Required: PDP-10, Disk; PDP-11/20, DC11AB—full duplex

Abstract: A program called (LOD11) written for the PDP-11 computer, and a program called (LOD11X), written for the PDP-10 computer, allows full duplex conversation between the PDP-10 monitor and the PDP-11 teletype. Furthermore, PDP-11 programs assembled on the PDP-10 may be loaded directly into PDP-11 core.

Note: This program also available as DECUS No. 10-148

Media Price Code: D3, H32

Format: RT-11

MAGTAPE LOADER

Author: Barry Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA
Source Language: PAL-11
Memory Required: 4K Minimum
Special Hardware Required: DATUM 9 track magtape, ASR33, PC11 HS Reader

Abstract: Transfers binary load modules from magtape to memory. Presently up to 15 standard binary modules may be loaded onto magtape and selectively loaded into memory using this program. This is much faster than loading directly from paper tape and, in addition, eliminates the handling of bulky paper tape modules.

Media Price Code: D2, F5, G8

11-51

Modifications to ED-11 V004A

Author: Kenneth LaBaw
Naval Weapons Center, China Lake, CA
Source Language: PAL-11
Other Software Required: ED-11 Text Editor

Abstract: This modification, which can be loaded after ED-11 V004A, provides the following features:

Line Printer Output "W" (prefixes allowed as with "L"), Automatic retention of "N" if there is no line printer, Power Fail Routine, Memory Size Correction, ED-11 Restart at 0.

Media Price Code: D1, G5 (includes F)

A General-Purpose External Function for PDP-11 BASIC

Author: E. C. Oakley
 (formerly of) Jet Propulsion Laboratory, Pasadena, CA
Source Language: PAL-11A
Memory Required: 48 words
Other Software Required: PDP-11 BASIC, V007A
Special Hardware Required:

Abstract: This function can move data to and from any peripheral device located along the PDP-11 Unibus. It greatly simplifies input-output programming tasks, within BASIC's language environment. EXF can add much flexibility to ordinary computational BASIC programs not requiring peripheral control capabilities.

Media Price Code: D2

ODT-11T

Author: Barry Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA
Source Language: PAL-11
Memory Required: ODT-11T requires 1200 words without the stack

Abstract: ODT-11T is a relocatable version of ODT-11X (ref. DECUS No. 11-52, ODT-11XR) with a program execution timer. A time command T has been added to allow execution timing of any selected portion of a program. Time is accurate to $\pm 10 \mu$ sec.

Media Price Code: B3, F5, G22

UNPAL-11A Mnemonic Dump

Author: Peter J. Moylan
 University of Newcastle, Australia
Source Language: PAL-11A
Memory Required: 2000 to 22236 plus small stack at 37500

Abstract: This program dumps a selected section of PDP-11 core memory to the teletype. The dump is in mnemonic format, using PAL-11A instruction mnemonics.

Media Price Code: D2, F5, G8

DSKBOT

Author: Edward A. Gardner
 Automated Health Systems, Wakefield, MA
Source Language: PAL-11
Memory Required: 4K
Special Hardware Required: paper tape (low or high speed)

Abstract: Performs the function of the BM792-YB bulk storage bootstrap loader, with the addition of certain options for ease of use.

11-55

11-57

11-58

11-59

11-60

11-60 (Cont.)

DSKBOT is supplied as a paper tape in bootstrap format. Source and binary tapes are also available, but these are not for DSKBOT itself, but rather a program which punches out the DSKBOT bootstrap tape. It determines which type of paper tape would be used by the loaders (from address XX7776) and punches on that device.

Media Price Code: D2, G5 (includes F)

11-64**DOS VERSION OF BASIC**

Revised: 13 August 1974

Author: Peter J. Moylan & F.C.P. Huang

University of Newcastle, Australia

Operating System: DOS/BATCH

Source Language: PAL-11R

Special Hardware Required: at least 12K of core, EAE or EIS and DECTape

Abstract: Implements a superset of PDP-11 BASIC to run under DOS. Extensions to the language include plotting commands for visual display and incremental plotter.

Restrictions: One user only

Media Price Code: A2, H32

Format: DOS-11

BXMIT**11-61**

Author: Barry Kaplan and Stan Shell
EPSCO, Inc., Westwood, MA

Source Language: PAL-11

Memory Required: 4K

Special Hardware Required: PC11 HS Reader/Punch

Abstract: BXMIT is a binary transmitter routine for the ASR33 teletype, PC11 high speed punch, LOGOS 132 column line printer, and DC11 interface unit (unit 1). The routine is used to transmit selected binary patterns to the various peripherals. It is primarily used for checking out the DC11 line interface.

Media Price Code: D2, G5 (includes F)

11-65**EDUALO—Multi-user BASIC**

Author: N. C. S. Long

Hawker Siddeley Aviation, Ltd., Kingston-Upon-Thames, Surrey, England

Operating System: DOS/BATCH

Source Language: PAL-11

Memory Required: 8K Paper Tape or 12K DOS System

Other Software Required: EDU70 V002A

Abstract: This version of EDU70 Multi-user BASIC can be loaded under DOS and allows free core to be allocated to users in the ratio specified by the initial dialogue.

Note: Only the overlay source is available.

Media Price Code: A1, F12, G5

Procedure for Interfacing to FOCAL-11**11-62**

Author: Joseph F. Iaquinto

General Motors Engineering Staff, Warren, MI

Other Software Required: FOCAL-11 (DEC-11-LFOCA-A-D)

Abstract: This is a manual to aid the user in adding functions to FOCAL-11.

Media Price Code: A1

11-66**PALDMP. K042**

Author: N.C.S. Long

Hawker Siddeley Aviation, Ltd., Kingston-Upon-Thames, Surrey, England

Source Language: PAL11

Memory Required: 4K

Abstract: This program dumps the core memory in PAL11 mnemonic assembly language form. The program is relocatable and used as DEC's Teletype Octal Dump. The resulting output can be reassembled by the PAL11 assembler.

Restrictions: No non-existent memory protection

Media Price Code: A1, F5, G8

SRL Magtape Operating System**11-63**

Author: James W. Brown

Space Radiation Lab., California Inst. of Technology, Pasadena, CA

Source Language: PAL-11A

Memory Required: 8K minimum (See note)

Special Hardware Required: TM11 with one to eight TU10 tape drives, PC11 optional

Abstract: SRL is a magnetic tape operating system consisting of SRLSYS, a permanently resident monitor for the PDP-11 which is heavily magnetic tape oriented; IOXMTA, and extension of the DEC program IOX which is an interrupt-controlled input/output processor that lends itself to device-independent I/O programming; and a SYSGEN procedure for expanding the system to fit a larger configuration. Other programs supplied with SRL include:

SRLPIP – File Manipulation Utility

ED-11M – Magnetic Tape Text Editor

PAL-11M – Magnetic Tape Absolute Assembler

PAL-11MR – Relocatable Assembler

LINK-11M – Magnetic Tape Linker

LOAD-11M – Absolute Loader

Note: SYSGEN, PAL-11M, PAL-11MR, and LINK-11M require 12K core memory. SRL is not compatible with DOS/BATCH.

Media Price Code: A8, F42, P85

Format: SRL

EBCDIC To ASCII Magtape Conversion

Author: Chuck Forsberg

Tektronix (IDP) Inc., Beaverton, OR

Operating System: DOS/BATCH

Source Language: PAL11R

Memory Required: 8K

Special Hardware Required: 9-track TM-11

Abstract: Translates EBCDIC tapes (card image format) to ASCII. Provides for card deck label selection and suppression of deck labels and trailing spaces.

Restrictions: Editing function not valid if line length is not 80 characters

Associated Documentation: IBM 360 Reference Data Dard; Memorandum to Recipients of System/360 Scientific Subroutine Package. (Not supplied by DECUS)

Media Price Code: A1, B3, G10

ALGEBRA—A Program for Manipulating Logical Expressions*Author:* P. J. Brown and R. C. SaundersUniversity of Kent at Canterbury, Canterbury, Kent, England
Operating System: DOS/BATCH*Source Language:* PAL-11*Memory Required:* 2.5K words + data storage

Abstract: ALGEBRA allows the user to declare a set of objects and then to define a number of operators that can be applied to these objects. The objects are called values. Once the operators and values have been defined the user can investigate their properties by evaluating expressions involving variables, operators and values.

Media Price Code: A2, H32*Format:* DOS-11**ML/I Macro Processor**

Author: P. J. Brown; DOS11 Implementation by R. C. Saunders
University of Kent at Canterbury, Canterbury, Kent, England
Operating System: DOS/BATCH
Source Language: PAL-11
Memory Required: 7.6K words plus data storage

Abstract: ML/I is a general purpose macro processor. It can process any kind of text. It provides the user with a simple means of adding extra statements to an existing programming language to make the language more suitable for his own field of application. Other uses of ML/I are program parameterization, text editing or correction, and data format conversion.

Media Price Code: A10*Format:* (ORDER DECTape DECUS No. 11-68)**DOS BASIC, Version 2A***Author:* George Shering
CERN*Revised by:* G. Shering and G. Everhart,
Massachusetts Institute of Technology,
Cambridge, MA*Operating System:* DOS/BATCH*Source Language:* PAL-11R*Memory Required:* 8K or more

Abstract: Single user BASIC has been implemented to run under DOS. Programs may be OLDED, SAVED, or RUN from any DOS dataset. Provision for binary or ASCII I/O has been incorporated, logical operations on integers are supported, and extensive support for user written functions (in MACRO) callable from BASIC has been added. The full range of DOS CTRL-C commands is supported.

*Documentation on Media.**Media Price Code:* A1, H32*Format:* DOS-11**ACCEPT—FORTRAN Subroutine***Author:* J. Eric PollockUniversity of Washington, Department of Oceanography,
Seattle, WA*Source Language:* MACRO-11*Memory Required:* Sufficient to support FORTRAN

Abstract: ACCEPT is a FORTRAN callable free format input routine which provides a service similar to the FORTRAN ACCEPT statement. Free format input is scanned per call specifications to extract integer, real, or character string arguments separated by blanks or commas. Null arguments are treated as zeroes or skipped as specified.

This program was designed with FORLIB version 17 in mind. No guarantee is made that it will work with other versions of the FORTRAN object time system.

Media Price Code: A1, H32*Format:* DOS-11**11-68****“3D-TIC-TAC”***Author:* Wayne H. Tanaka

Naval Weapons Center, China Lake, CA

Source Language: PAL-11

Abstract: A demonstration program to compare pattern recognition of a computer with that of a human. The program is a TIC-TAC-TOE game played on a $4 \times 4 \times 4$ board. The game rules are contained in the program.

Restrictions: TTY Interrupt disabled*Media Price Code:* A1, F6, G16, K27*Format:* RT-11**11-69****LP or CR PDP-11 DOS Drivers for Use With A.****B. Dick Videojet Printer***Author:* R. M. Cunningham

University of Missouri, Columbia, MO

Operating System: DOS/BATCH V004A*Source Language:* PAL-11R*Special Hardware Required:* A.B. Dick Videojet Printer**11-70**

Abstract: An A. B. Dick Videojet Line Printer (LP) driver has been written for the PDP-11 Disk Operating System (DOS). The DEC DOS Card Reader (CR) driver has been modified to make it compatible with the Videojet printer. The source tape for the LP driver can be conditionally assembled to provide a driver for a Videojet printer either with or without the form feed option. In addition, conditional assemblage is available for systems either with or without a card reader. The CR driver source tape can also be conditionally assembled following DEC supplied instructions. After assembly and linking the load modules can then be easily incorporated into the monitor library.

Media Price Code: D2, G24**11-71****ODT-11, ODT-11X, Revised***Submitted by:* Ward P. Whitlock

Watkins-Johnson Company, Rockville, MD

Source Language: PAL-11

Abstract: These are DEC programs DEC-11-01PA and DEC-11-02PB which the submitter feels were bothersome under certain conditions, particularly in debugging new programs. Areas treated in this revision include: the stack, coding, breakpoint table handling, breakpoint handling and manual entry processing.

Media Price Code: A2, B4, F5, G26**11-71****LOADER***Author:* John R. Brassard

University of Texas Medical Branch, Galveston, TX

Operating System: DOS/BATCH*Source Language:* PAL-11R

Abstract: LOADER is a modified version of the DEC Absolute Loader Program for use with the PDP-11 Disk Operating System (DOS). It can be used to load into core paper tape programs punched in absolute binary format. This program can be run from the disk using the Monitor RUN command.

Restrictions: Bottom addresses (when linked) must be in core limits

Media Price Code: D2, F5, G6

PDPAS—PDP-11 Assembler*Author:* Aloysius Chu*Submitted by:* Thomas Lanzatella

University Computing Center, University of Minnesota, Minneapolis, MN

Source Language: FORTRAN IV*Special Hardware Required:* card reader, mass storage

11-76

PARITY—Paper Tape Compatibility with I.C.L.

11-80

Author: Barry L. Seward-Thompson

Unit of Coastal Sedimentation, N.E.R.C., Taunton, Somerset, England

Operating System: DOS/BATCH*Source Language:* PAL-11

Abstract: PDPAS converts a PDP-11 assembly into PDP-11 absolute binary code and produces an octal symbolic listing with error messages after two passes. An optional cross reference table of user defined symbols can be obtained. PDPAS is written in FORTRAN IV with the exceptions of 3 non-standard functions and 2 non-standard data statements. The length of a computer word is assumed to be at least 16 bits long. The object codes generated are left in memory and can be written on a file in a form acceptable to the PDP-11 absolute loader (see page 5-9 of the DEC-11 GGPA-D manual).

Media Price Code: A2, B4**PERMUT—Permutes a Given Sequence of Numbers**

11-77

Author: Robert Maulsdale

University of Birmingham, Birmingham, United Kingdom

Source Language: PAL-11R

Abstract: PERMUT reorders the N elements of a user supplied array, giving the next permutation in the sequence. It is designed to be called from an assembler program or a PDP-11 FORTRAN program.

Media Price Code: D2, G5**DFWFT—Discrete Fast Walsh-Fourier Transform Subroutine**

11-78

Author: Urs R. Wyss and Reto Bardola

Institut fuer Hirnforschung, University of Zurich, Zurich, Switzerland

Operating System: DOS/BATCH V004A*Source Language:* PAL-11R

Abstract: DFWFT is a subroutine written for the PDP-11/20 for performing a forward or inverse Discrete Fast Walsh-Fourier Transform of N real data elements, where N is a power of 2 in the range $8 \leq N \leq 16384$. A sample size of 1024 elements is transformed in 357 msec (0.357 sec). 560 words of core storage is required for the control section (subroutine), and N words for the data section. The source module is written for the DOS-11 environment, minor changes are required for a paper tape system. DFWFT may be invoked as a FORTRAN subroutine.

Media Price Code: D3, H32, K27*Format:* DECtape-DOS-11, Floppy-RT-11**PDP-11 Reverse Assembler**

11-79

Author: J. E. Bowdle

Goodyear Atomic Corporation, Piketon, OH

Source Language: PAL-11A

Abstract: This program converts PDP-11 binary paper tapes (absolute or relocatable) to a form similar to the listing pass of the program written in PAL-11A which would have produced the binary tape. It does not use IOX. The user may potentially insert patches for other I/O devices.

Restrictions: Output limited; does not have all op-codes for 11/45*Media Price Code:* A2, B3, F8, G14**MTFDEL—TU10 Magtape File Deleting Program**

11-81

Author: Barry L. Seward-Thompson

Unit of Coastal Sedimentation, N.E.R.C., Taunton, Somerset, England

Operating System: DOS/BATCH*Source Language:* PAL-11*Special Hardware Required:* TM11/TU10 Magtape Drive

Abstract: This program was written to facilitate file deletion on TM11/TU10 magtape under DOS V004A. Under PIP, tapes can only be zeroed. In MTFDEL, a tape drive and filename is specified in CSI format and the file is overwritten by a Logical E-O-T which thus deletes the named file and all subsequent files on the tape.

Media Price Code: D2, G5 (includes F)**RK11 Disk to Disk Duplicator**

11-82

Author: Larry D. Rice

NCCS-WORD, Inc., Beechwood, OH

Operating System: DOS/BATCH*Source Language:* MACRO-11*Special Hardware Required:* two RK11 disks

Abstract: Duplicates the entire contents of one RK11 disk pack onto another RK11 pack: reads from drive 0 and writes onto drive 1.

Media Price Code: D2, F5**FILDMP (K082) with /PA(L11) Switch Option**

11-83

Author: N. C. S. Long

Hawker-Siddeley Aviation Ltd., Kingston-Upon-Thames, Thames, Surrey, England

Operating System: DOS/BATCH*Source Language:* PAL-11

Abstract: This is a modified version of DEC's dumping utility FILDMP. An additional output switch has been provided which allows the translation of a binary file into an equivalent PAL-11 mnemonic listing.

Note: Currently, version V005A of FILDMP is used*Media Price Code:* D2, F12, G30

IOXCRT—Input Output Executive with CRT and Hard Copier*Author:* Stephen Gill

Ball Brothers Research Corporation, Boulder, CO

Source Language: PAL-11A*Special Hardware Required:* Tektronix 4010 CRT and 4610 Hard Copier

11-84

CRTEXT*Author:* G. Bernstein

McGill University, Montreal, Quebec, Canada

Operating System: DOS/BATCH*Source Language:* PAL-11R*Special Hardware Required:* VR14 CRT, CRT Controller

11-87

Abstract: IOXCRT is an extension of DEC program IOX. It adds code to support the Tektronix 4010 CRT and 4610 Hard Copy unit as a teletype.

With this package the user can control certain CRT and Hard Copier functions from the keyboard. He also can command IOX to initiate a hard copy of the CRT automatically each time the screen fills. There are no special provisions for graph mode. However, the graph may be utilized through the unformatted binary mode.

Several other small changes have been made which are discussed under the section on non-related changes.

The reader should be familiar with the write-up covering IOX in the Papertape Handbook available from DEC.

Restrictions: No .END directive in last tape*Media Price Code:* A1, G22**IOXEXT—Input Output Executive Extended***Author:* Stephen Gill

Ball Brothers Research Corporation, Boulder, CO

Source Language: PAL-11A*Special Hardware Required:* Tektronix 4010 CRT and 4610 Hard Copier, or TM11 Magnetic Tape

11-85

Abstract: IOXEXT is an extension of DEC program IOX. It adds two devices to the present version of IOX supplied by DEC.

These devices are the Tektronix 4010 CRT with the 4610 CRT Hard Copier, and the TM11 magnetic tape controller with up to 8 tape units. There are no special provisions for the CRT graph mode. However, the graph may be utilized through the unformatted binary mode.

Several other small changes have been made which are discussed under the section on non-related changes.

The reader should be familiar with the write-up covering IOX in the Papertape Handbook available from DEC.

Restrictions: No .END directive in last tape*Media Price Code:* A2, G30**EDDY—A Scope Oriented Editor for the PDP-11***Author:* G. Bernstein

McGill University, Montreal, Quebec, Canada

Operating System: DOS/BATCH*Source Language:* PAL-11R*Special Hardware Required:* VR14 Point Display, Scope Controller

11-86

Abstract: EDDY is a modification to the EDIT11 (Editor) program which will display portions of the Editor's ASCII buffer on a CRT. Only minor modifications were incorporated into EDIT11 so that all EDIT11 commands have been preserved, and all modifications are invisible to the user. EDDY may be used without the CRT with no obvious differences to the user. With the CRT connected, 70 characters are displayed on the screen, 10 preceding 'dot' and 60 following it. In addition, facilities are provided for a quick scan of the entire ASCII buffer.*Note:* EDIT11.OBJ (modified) and DISTXT.PAL also provided on DT should user wish to make modifications. Modification procedures can be obtained through personal communication with the author*Note:* DECtape includes 11-87.*Documentation on Media.**Media Price Code:* D2, H32*Format:* DOS-11**CRTEXT***Author:* G. Bernstein

McGill University, Montreal, Quebec, Canada

Operating System: DOS/BATCH*Source Language:* PAL-11R*Special Hardware Required:* VR14 CRT, CRT Controller*Abstract:* This is a stand-alone module which allows the user to display alphanumeric messages on a point-plot CRT. Up to 9 lines of message can be displayed. The user communicates with CRTEXT via a suitable executive program, which simply involves pushing the address of his ASCII buffer onto the stack and making repeated jumps to CRTEXT to maintain the display.*Media Price Code:* (Order DECUS No. 11-86)**COMPU/CORDER PDP-11 DOS Driver**

11-88

Author: Jon Shapiro*Submitted by:* Edward L. Pavia

Sykes Datronics, Inc., Rochester, NY

Operating System: DOS/BATCH*Source Language:* PAL-11*Special Hardware Required:* Sykes COMPU/CORDER 120 or 220*Abstract:* This is a driver that causes a Sykes COMPU/CORDER 120 or 220 to behave exactly like DECtape. Each cassette will contain 578 blocks of 256 16-bit words exactly like DECtape. Each block of data is directly accessible at 120 inches per second. All DECtape requests from DOS, PIP, etc. are intercepted by the driver and executed on the cassette. By emulating DECtape, files may be generated, assembled, edited, etc. on a cassette in exactly the same manner as they would be on DECtape. Bench mark tests show similar speeds between DECtape and the cassette. A ZERO program (DECUS No. 11-89) is used to initialize the cassette (write bit maps and change interleave factor from 4 to 1).*Media Price Code:* D2, H32**ZERO**

11-89

Author: Staff

Sykes Datronics, Inc.

Submitted by: Edward L. Pavia

Sykes Datronics, Inc., Rochester, NY

Operating System: DOS/BATCH*Source Language:* PAL-11*Other Software Required:* COMPU/CORDER Handler (DECUS No. 11-88)*Special Hardware Required:* Sykes COMPU/CORDER 120 or 220*Abstract:* This is a short routine used to initialize cassettes similar to the way DECtape is initialized when using the /Z switch in PIP. Bit maps are written and the interleave factor is changed from 4 to 1. Cassettes that are initialized can then be used with the COMPU/CORDER DOS Driver (DECUS No. 11-88) to emulate DECtape.*Media Price Code:* (Order DECUS No. 11-88)**Listing Program for a PDP-11 Computer**

11-90

Author: R. P. Loretan

University of Essex, Colchester, Essex, England

Source Language: PAL-11*Other Software Required:* IOX*Special Hardware Required:* HS Reader/Punch*Abstract:* This program paginates PAL-11 Source tapes in A4 format. A page header is introduced which is accepted by the assembler as a comment. "Formfeed" in the source effects the start of a new page. This

11-90 (Cont.)

is not corrupted by subsequent editing, as the pages are regenerated by the program in every run (blank lines after a "Formfeed" are ignored).

Media Price Code: D2, F5, G5

BLDP11 Block Display Program**11-91**

Author: Rudolf E. Kubli

Institut fur Biomedizinische Technik, Der Universitat und der ETH Zurich, Zurich, Switzerland

Operating System: DOS/BATCH

Source Language: PAL-11R

Special Hardware Required: VR20 or VR14 point plot display

Abstract: BLDP11 allows the user to display randomly selectable 256 word data blocks (1 word integers) of contiguous files by keyboard commands. Features: 1 input file (automatic linear X-scale) or 2 input files, maximum 4 blocks (next to each other or superposed) + 50 ASCII characters comment, automatic and manual scalings.

Media Price Code: A2, H32

Format: DOS-11

SAPLOD—Stand-Alone Program Loader for DOS**11-92**

Author: William Little IV

Digital Equipment Corporation, Houston, TX

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: SAPLOD allows DOS-11 users to load stand-alone programs such as Paper Tape Software Programs, MAINDEC diagnostics and user written routines which have been stored as normal DOS files on disks, DECTape and magtape.

Media Price Code: D2, R30

ADC**11-93A**

Author: Morris Frimer

University of Washington, Seattle, WA

Operating System: DOS/BATCH

Source Language: MACRO-11

Special Hardware Required: KW11-P Programmable Clock, AD01 Converter, KE11-A Extended Arithmetic Unit

Abstract: ADC is a multiple entry subroutine designed to interface a user's high level language program with the A/D converter for high data rates. This subroutine returns immediate control to the user while it drives the converter and stores the data on a mass storage device and keeps the user informed on status of process. The user may specify order of channels to be digitized simultaneously, gain to be used on each channel, and name for output contiguous file if desired.

Note: Tape includes versions for 11/45 and 11/20. DECTape includes 11-93B and 11-93C.

Media Price Code: A2, H32

Format: DOS-11

SCORE**11-93B**

Author: Morris Frimer

University of Washington, Seattle, WA

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: SCORE is a multiple entry subroutine to provide the higher level language user with means to directly extract any segment of any

length from a contiguous file without regard to any logical or physical boundaries. File parameters describing the logical organization of the data are: number of groups (number of blocks (number of records (length of record))). Data is extracted starting at a work number (record number (group)) through the number of words requested for the same record number. This is compatible with the architecture of files created by subroutine ADC.

Restrictions: Full blocks of 256 words each

Media Price Code: (Order DECUS No. 11-93A)

NPACK

11-93C
Author: Morris Frimer

University of Washington, Seattle, WA

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: NPACK is a FORTRAN callable subroutine to RAD50 code an ASCII string that adheres to standard DOS file naming conventions. Compatible for both 11/20 and 11/45.

Media Price Code: (Order DECUS No. 11-93A)

Transformed Z Scores

11-94
Author: William Wilmot and Wesley Shellen

University of Montana, Missoula, MT

Source Language: FOCAL-11

Abstract: This program can be used to calculate transformed Z scores on student grades and other data. The Z scores have a mean of 50, standard deviation of 2103 and range of 1-99. In addition an output option allows for frequency counts and cumulative percentages of raw scores.

Media Price Code: D1, G5

Real-Time Overlay for 1-8 User BASIC-11**11-95**

(V002A)

Author: James E. Davis and L. B. Rogers

Chemistry Dept., Purdue University, West Lafayette, IN

Source Language: PAL-11

Other Software Required: 1-8 User BASIC-11 (V002A)

Special Hardware Required: Real-Time and line clocks, DECTape, EAE, D/A converter, DR-11A scope (TEK-611)

Abstract: The source program and additional descriptive material show how to add real-time I/O patches to BASIC without recompiling in a paper tape based environment. Although BASIC, together with the I/O patch, fits into 8K of core a more realistic minimum is 12K. One-user operation is approximately five times faster than BASIC written for a single user having 4K of core. With 16K, two-user BASIC has been employed successfully for rather lengthy periods.

Restrictions: Overlay should be tailored to user's peripherals. Multi-user priority on peripherals not resolved.

Media Price Code: A2, B5, H32

Format: DOS-11

PROCON-11**11-97**

Author: Paul R. Condit

Automatic Production Systems, Pennsauken, NJ

Source Language: PAL-11R

Memory Required: 4k

Abstract: PROCON-11 is a set of debugging aids designed to assist the programmer in the maintenance and alteration of existing programs and

11-97 (Cont.)

to facilitate the preparation of new ones. In addition to commonly used debugging routines such as core dumps, PROCON-11 also includes a selected group of self-contained device handlers, which are often useful in the debugging of more complex handlers.

No Source Available.

Media Price Code: A2, F6

MASK

Author: Bernt Hogkvist

Submitted by: Tomas Lofgren

Digital Equipment Corporation, Stockholm, Sweden

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: This subroutine package for use in FORTRAN programs provides the user with a simple means of working on bit level which is generally available only in MACRO programs. The functions included are: AND, OR, XOR, Rotate, Bit set, Bit clear and Bit test.

Media Price Code: D1, G5

KTDVR—Keyboard Terminal Driver for DOS

Author: Thomas R. Reed

University of Western Australia, Nedlands, Australia

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: KTDVR.MAC is a MACRO source module for keyboard drivers which can be conditionally assembled to provide drivers for either the command device "KB" or additional keyboard terminals. The driver can provide standard DOS character handling or can be conditionally assembled to allow VT05 cursor and display control including direct cursor addressing. When assembled for VT05B the driver will insert the proper padding for high Baud rate operation. Drivers can be generated for either V4 or V8 of DOS.

Restrictions: Not suitable for Serial LA-30 at 300 Baud

Media Price Code: A2, G22

LP.PAL, SP.PAL; TTY Drivers for Printer, Punch and Reader of V4 Monitor

Author: Thomas R. Vanderpool

University of Wisconsin, Madison, WI

Operating System: DOS/BATCH V004A

Operating System: V004A DOS

Source Language: PAL-11R

Special Hardware Required: PDP-11, Additional TTY other than console

Abstract: Two programs written for use with the PDP-11 V004A DOS Monitor. SP.PAL replaces the MT Magtape driver on disk with a driver for the slow punch and reader of an additional TTY. LP.PAL replaces the CR Card Reader driver on disk with a driver for the TTY Line Printer.

Media Price Code: A1, G8

Conway's "Life", PAL-11S Version

Author: H. J. Morrison

Naval Underwater Systems Center, New London, CT

Source Language: PAL-11S

Abstract: An assembly level digital computer program for Conway's "Life." A Digital Equipment Corporation PDP-11 minicomputer, with at

least 4,000 words of core memory and a teletype is required. A VR-14 display unit, a high speed paper tape reader and a DECtape recorder can be used. Simple commands are input via the teletype to control the operation of the program.

Program will start automatically if loaded with Absolute Loader.

Media Price Code: D5, F12, G20

FBTRAN—Formatted Binary Transfer

Author: James H. Stein

Security General, Santa Clara, CA

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: FBTRAN supports formatted binary transfers from the low speed paper tape reader (teletype). This is a function not provided by PIP. Absolute tapes can be read into a disk or DECtape file, which can then be used as input to SAPLOD (DECUS NO. 11-92). For convenience SAPLOD files are included on the FBTRAN tape.

Media Price Code: D2, H32

Format: DOS-11

11-102

HDC1, a Finite Element Computer Program for Two-Dimensional Stress of Elastic Solids

Author: Howard D. Curtis

Embry-Riddle Aeronautical University, Daytona Beach, FL

Operating System: DOS/BATCH V8.02

Source Language: FORTRAN IV

Memory Required: 12K minimum

Abstract: The finite element displacement method of two-dimensional stress analysis of elastic solids using the constant-strain triangular element.

Restrictions: Attempts to run in less than 12K, without modifications, will not be successful

Media Price Code: D5, H32

Format: DOS-11

11-103

HDC2, a Finite Element Computer Program for Two-Dimensional Steady-State Conduction Heat Transfer Analysis

Author: Howard D. Curtis

Embry-Riddle Aeronautical University, Daytona Beach, FL

Operating System: DOS/BATCH V8.02

Source Language: FORTRAN IV

Memory Required: 12K minimum

Abstract: The finite element method of two-dimensional steady-state conduction heat transfer analysis using the linear-temperature triangular element.

Restrictions: Attempts to run in less than 12K, without modification, will not be successful

Media Price Code: D5, H32

Format: DOS-11

11-104

POLFIT, A FOCAL Program to Fit Data to Polynomials up to 6th Degree

Author: Larry V. East

Los Alamos Scientific Laboratory, Los Alamos, NM

Source Language: FOCAL-11

11-105

11-105 (Cont.)

Abstract: A FOCAL program that makes a least-squares polynomial fit to data supplied by the user. The program uses doubly subscripted variables, and is intended for use with the PDP-11 version of FOCAL.

Media Price Code: A2, G5

Assorted Routines for use with DOS-11

11-106

Author: Glenn Everhart and Craig Everhart

Massachusetts Institute of Technology, Cambridge, MA and Wesleyan University, CT

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: Documentation and Source files for the routines listed below are available on one DECTape. The write-up available from DECUS describes the groupings on the tape and explains them more fully than the brief abstracts listed here.

1. Subroutines for plotting lines, graphing, and writing alphanumeric text on the VT01 storage display, from the NAL Bison package, with modifications for PDP-11/45 use, are provided, with FORTRAN-Callable interfaces.

2. Two games, DOTS and SPACEWAR, both written in FORTRAN IV, are provided. In SPACEWAR, two humans play, using the VT01 in non-store mode as a display of the positions of their rockets with respect to the sun, each other, and all torpedoes on the board. In DOTS, a human plays against the computer. The VT01 is used in store mode, and plotting and text routines in package 1 are illustrated. Advantages and limitations of the machine's heuristic strategy, and of prediction of results in certain situations, are shown.

3. A set of functions and subroutines is provided which can be inserted in a system FORTRAN library, giving FORTRAN the capability of performing all Boolean logic operations of one or two variables directly on integers, of finding addresses of arguments, of word shifts and rotations, and of finding the contents of any part of memory. In addition, a pair of routine packages, one DOS-oriented, the other stand-alone, but both FORTRAN-callable is provided to allow direct access to magnetic tape, outside the usual DOS-11 file label and record length conventions. (This is handy for talking to other kinds of computers.)

4. A VT01-using editor is supplied. It is a modified EDIT-11 V006A in which all commands are preserved, but which displays 10 characters before dot to 60 after dot on the VT01 storage display, when the switches on the console are not all zero. When they are all zero, slow stepping of the display through the entire text buffer, 60 characters at a time starting at dot, is provided. Normal operation resumes when 1 or more switches are raised.

5. A set of FORTRAN-callable functions to provide scatter plots, line graphs, or generalized graphs on the Versatec (11" wide) printer-plotter is provided. These drive the plotter in stand-alone, non-interrupt mode to activate any nib in the write head under control of the calling routines.

Documentation on Media.

Media Price Code: A2, H32

Format: DOS-11

"The Hockey Game"

11-107

Author: Rick Siraco and Glenn Martinsen

Digital Equipment Corporation, Westminster, MA

Source Language: BASIC

Memory Required: 8K

Abstract: A player versus computer game of hockey which closely simulates the real thing. Includes faceoffs, deflected pucks, kick saves, pucks tied up against boards, etc. Games are close and exciting.

Note: Requires modification for use with RT-11 BASIC.

Media Price Code: G8, K27

Format: RT-11

TTYALL, Multi-Teletype Dispatcher

Author: James Stanfill

Department of Medicine, University of Washington, Seattle, WA

Operating System: RSX-11D

Source Language: MACRO-11

Memory Required: 1424 words

Special Hardware Required: PDP-11/45 (or 40), 1 to 15 remote TTY-like terminals, sufficient core to support the multi-user capability of RSX-11D

Abstract: This is a multi-teletype dispatcher designed to utilize the Control-X function of the RSX-11D Operating System for the PDP-11/40/45 Computer. It is not designed to be another MCR. Its intent, rather, is to allow a user (e.g., a nurse or technician) who is not familiar with RSX-11D to run previously developed programs at a remote terminal. The dispatcher task executes at a priority just under the MCR, and will service any remote terminal for which a specific task (also described) is installed in the task list.

Media Price Code: A5, H32

Format: FILES-11

IOS—PDP-11/45 Formatted Input/Output Task

11-109

Stacker and Processor

Revised: 8 July 1974

Author: John Koschik

Randall Laboratory, University of Michigan, Ann Arbor, MI

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 3K (with Floating Point Processor)

Other Software Required: (Modified) SYSMAC.SML file

Special Hardware Required: PDP-11/45, Keyboard Device, Disk (DK, DF or DC), Line Frequency Clock

Abstract: IOS allows the programmer to perform formatted input/output at assembly language level to/from any peripheral device. It runs under DOS version V08-08 or V9-19, reading and writing DOS compatible files. Additionally IOS will run, with total transparency, in an environment with memory management enabled.

Documentation on Media.

Media Price Code: A2, H32

Format: DOS-11

Utility Routines for a PDP-11/45 With a

Floating Point Processor

Author: Kenneth B. Wiberg

Department of Chemistry, Yale University, New Haven, CT

Source Language: MACRO-11

Special Hardware Required: PDP-11/45 with FPU

Abstract: This is a set of routines for input/output, square root, trigonometric and exponential functions which are designed for convenient interfacing with assembly language main programs. The floating point routines use AC0 to transmit the argument and operate in the precision of the calling program (i.e. single or double). The input/output routines are designed for flexibility. Thus, the floating point input routine accepts both F and E format input and takes any non-numerical character other than +, -, . or E as a terminator. The F format output routine gives an E format output if the number is too large for the field specification.

The I/O routines are monitor independent in order to provide maximum flexibility and eliminate the need to set up link-blocks, file-blocks, etc. If desired, they could easily be interfaced into the DOS monitor.

11-110 (Cont.)

Unlike most math routines, the ones given here use straightforward application of power series so that the user may control the precision. Timing and precision data are given as a function of the number of terms used.

Media Price Code: A2, B5, H32
Format: DOS-11

"LEM" (Simulation of a Lunar Landing)

Author: Leigh Clayton
 Acadia University, Hantsport, Nova Scotia, Canada
Operating System: DOS/BATCH
Source Language: MACRO-11

Abstract: The LEM program is a simulation of the landing of the Lunar Excursion Module on the moon. The program gives constantly updated numerical displays of all relevant data on the VT05 screen, while allowing the user to change main thrust and attitude, as well as certain control functions, by striking keys on the VT05 keyboard. The program requires VT05, KL11-L (Line Frequency Clock) with 60 Hertz supply, and a basic PDP-11/45 with the floating-point option. It is assembled, linked and loaded under the DOS-11 system, version 6A or later, and requires the MACRO-11 assembler.

Media Price Code: A1, B3, H32
Format: DOS-11

Fast, Accurate Matrix Equation Solver and Matrix Inverter

Author: G. Everhard
 Massachusetts Institute of Technology, Cambridge, MA
Operating System: DOS/BATCH
Source Language: MACRO-11
Special Hardware Required: PDP-11/45 with F.P.P.

Abstract: Solves the matrix equation AX=B where A is an N by N matrix and B and X are N by M matrices. Matrix inversion is a special case of this equation.

Restrictions: Uses floating-point and extended instruction set operations, though the simple version DOS BASIC contains code that probably can enable any PDP-11 to carry out the same operation, albeit more slowly

Media Price Code: D2, G6

READ—FORTRAN Compatible Free Format Input Routines

Author: Kenneth B. Wiberg
 Yale University, New Haven, CT
Operating System: DOS/BATCH
Source Language: MACRO-11
Other Software Required: DOS-11 FORTRAN
Special Hardware Required: PDP-11/45, Floating Point Processor

Abstract: PDP-11 FORTRAN currently does not have provision for free format integer and floating point data input. These routines (IREAD and FREAD) provide such a facility. With both routines leading spaces are ignored, and any illegal character in the context of the number is taken as a terminator. The usual terminators are a space or a carriage return.

Media Price Code: D2, G8

11-110 (Cont.)

GT40.MAC—A FORTRAN Subroutine Set for the GT40 Series Display (VT11)

Author: Everett A. Bruce
 Digital Equipment Corporation, Maynard, MA
Operating System: DOS/BATCH
Source Language: MACRO-11
Memory Required: 900 words
Special Hardware Required: GT40 Series Display (VT11)

Abstract: A set of subroutines has been written to allow the FORTRAN programmer to create, interact with, and modify pictures on the GT40 series displays. The calling sequences are designed to correspond as closely as possible to the PDP-15/VT15 FORTRAN routines. Facilities are included to build pictures in FORTRAN arrays from lines, points, text and other pictures, to modify the coordinates and parameters of those pictures in real time and to interact with an operator via the light pen, tracking symbol and keyboard. The routines are compatible with either DOS-11 or RT-11 and occupy less than 1000 decimal words of memory.

Media Price Code: A4, H32
Format: DOS-11

One Programmer's Utility Package for the PDP-11

Author: William H. Talbot, Ph.D.
 The Johns Hopkins University School of Medicine, Baltimore, MD
Operating System: DOS/BATCH V08.02 or V08.08
Source Language: MACRO-11
Special Hardware Required: Incremental Plotter optional

Abstract: This package contains macros, subroutines, and free-standing programs selected from the results of nearly two years' intensive assembly-language programming for the PDP-11. Most have been in error-free use for many months. Most will run in any PDP-11 DOS hardware configuration.

In all, the package comprises two macro library files, two object module library files, 44 MACRO-11 source files, and seven relocatable object files (for generation of free-standing programs). The two pair of library files provide for systems with and without a KE-11A extended arithmetic element.

Each of the two macro libraries contain approximately 40 macro definitions among which are macros that do the following: (1) push to or pop from the system stack any number of words or bytes that can be specified in the call, (2) simulate the integer multiply and divide instructions of the 11/40 and 11/45, (3) generate FORTRAN IV compatible subroutine calls in which argument lists may include a variety of addressing modes, (4) generate Link Blocks, File Name Blocks, and Line Buffer Headers, and (5) provide convenient linkages to subroutines contained in the object module libraries.

The object module libraries contain more than 30 modules each. These include modules for controlling an incremental plotter which are described separately below. Other modules include the following: (1) one that provides the assembly-language programmer with an output formatting capacity similar to FORTRANs, (2) two that provide alternate means of obtaining free-format input to FORTRAN programs, (3) a module that supports simple input/output macros to control the console terminal, (4) a module that performs the variety of input, output, and internal operations required to accept integer input values, check that each is in the range of acceptable values, and store checked values in structured arrays, (5) efficient FORTRAN subroutines to find the minimum, maximum, or both in an array of integers, and (6) a number of simple arithmetic subroutines that extend the assembly-language programmer's arithmetic power.

Ten of the modules in each object module library have to do with the control of an incremental plotter such as the Calcomp Model 565. Although these modules have been written for and tested with a particular plotter and a particular interface design, they may be of greater interest. All physical output is from a single module which can be adapted to a different plotter or interface to make the remaining modules immediately available for use. Plotter modules may be called from

11-114

11-115 (Cont.)

assembly-language or FORTRAN programs to draw vectors or character strings and to perform a variety of higher order function.

Free-standing programs in the package include three programs for manipulating DECtape directories to produce alphabetized and chronologically ordered indices to the contents of one or more DECtapes and programs for producing paged listings from ASCII files. Two of the listing programs produce reformatted listings of LINK11 load maps and macro library files.

Documentation includes separate descriptions of each major module and a brief general introduction.

Note: Listing service charge is per file.

Media Price Code: E10, H32

Format: DOS-11

BACADI, ASCII—EBCDIC Magtape File Dump**11-116**

Author: Robert Saunders and William Campbell

Searle Medidata, Inc., Lexington, MA and G. D. Searle & Co., Ltd., High Wycombe, Bucks HP124HL, England

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 2400 bytes

Special Hardware Required: Magtape

Abstract: BACADI creates a card image copy of an ASCII DOS file on an industry compatible magnetic tape, with each line expanded to 80 characters to simulate punched cards. This tape may now be processed by another computer system for easier card duplication, etc. The output may be either ASCII or EBCDIC, defined by a switch option. File concatenation is done on multiple input files. BACADI will run under either DOS or BATCH.

Media Price Code: D2, M55

Format: DOS-11

**TY.MAC, Typewriter Driver for Extra Teletypes
for DOS****11-117**

Revised: 2 April 1975

Author: G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH (V08 or later)

Source Language: MACRO-11

Special Hardware Required: Teletype-compatible extra terminal

Abstract: This is a driver for a teletype compatible terminal without paper tape. It will work on DOS V08 or later, and allow programs to do input and/or output to extra teletypes.

TY will correctly interpret CR and LF, ignore vertical tab, and echo form feed as line feed. Horizontal tabs are echoed as single spaces. Other control characters echo as up-arrow followed by the correct non-control character. The monitor buffer is used for I/O, so type-aheads are not possible. However, the driver is made small by this.

Media Price Code: D2, G10

GULP, Gamma-11 Utility Program**11-118**

Author: Dr. Robert Farmer

University of California, San Francisco, CA

Submitted by: Charles Merrill

Digital Equipment Corporation, Maynard, MA

Operating System: GAMMA-11

Source Language: FOCAL

Memory Required: 16K

Special Hardware Required: GAMMA-11 System

Abstract: This program was written to facilitate analysis of ROI dynamic curves. It can be used to move ROI-formatted data between

save registers, working buffer, keyboard device, and paper reader/punch. It allows pre-processing of curves, smoothing, masking, editing, subtracting background, removing previous studies, and correcting for dead-time. It is intended for use as data I/O for ROI analysis programs.

Media Price Code: A2, G8

Volume/Dosage Calculation Program for Tc or In**11-119**

Author: Trevor Cradduck

Toronto General Hospital, Toronto, Ontario, Canada

Submitted by: Charles Merrill

Digital Equipment Corporation, Maynard, MA

Operating System: GAMMA-11

Source Language: FOCAL

Memory Required: 16K

Special Hardware Required: GAMMA-11 System

Abstract: Creates a table of volumes of Tc or In to be used for a given dosage at a given hour of the day.

Media Price Code: D1, G5

Determination of Blood Volume & Red Blood**11-120****Cell Survival**

Author: T. J. Buchanan and R. W. Carlson

San Diego Naval Hospital, San Diego, California

Submitted by: Charles Merrill

Digital Equipment Corporation, Maynard, MA

Operating System: GAMMA-11

Source Language: FOCAL

Memory Required: 16K

Special Hardware Required: GAMMA-11 System

Abstract: A. Results of blood volumes are printed out in both total volume in millimeters and volume per weight in kilograms.

B. Least squares analysis for To (Extrapolated Intercept) and T 1/2 (Half Time) survival time of red blood cells.

Media Price Code: D2, G6

WABC Core Dumper**11-121**

Author: Thomas Powers

Hendrix Electronics, Manchester, NH

Source Language: PAL-11A

Memory Required: 1600₈ bytes

Special Hardware Required: High speed punch or line printer optional

Abstract: The WABC (Word, Absolute, Byte and Character) core dumper is a position independent program used to examine blocks of PDP-11 core too large to be easily examined by console action or ODT. All commands are entered through the teletype keyboard, and output can be directed to the teletype, line printer, or high speed punch (for later listing). Output is in the form of words, bytes, or ASCII characters, or in absolute loader compatible format. When accessed as a subroutine or trap routine, all user status and registers are saved and restored.

Media Price Code: D2, F5, G10

DVRTST DOS Driver Testing Package**11-122**

Author: J. K. F. Lee and Christopher Pottle

Cornell University, Ithaca, NY

Operating System: DOS/BATCH V08

Source Language: MACRO-11

Abstract: A pair of routines is provided to aid in the process of developing and debugging new DOS driver programs. The first replaces

11-122 (Cont.)

the PP: (high-speed paper tape punch) driver in DOS and contains hooks which will be hooked by the second program when called by a testing program to which it is linked. Thereafter any references to PP: will invoke the driver under test which has also been included in the user's load module.

Media Price Code: A1, G8

AN5800; A Group of Routines for Handling the Analogic AN5800 Data Conversion System

Author: Christopher Pottle

Cornell University, Ithaca, NY

Source Language: MACRO-11

Special Hardware Required: Analogic AN5800 Data Conversion System with AN374-DR11 Interface

Abstract: A group of FORTRAN-callable assembly programs which will handle analog-to-digital or digital-to-analog conversion through the Analogic AN5800 Data Conversion System. These programs are rather flexible, allowing conversion to be initiated under program control, externally, or using the KW11-P programmable clock.

Media Price Code: A2, G10

BLKUSE, Block Usage Summary for File

Structured Devices

Author: Thomas R. Reed

University of Western Australia, Nedlands, W. Australia

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 1063₁₀ words

Abstract: BLKUSE is a utility program which reports summary information about block utilization on DOS file structured devices. Each UIC in the master file directory is reported along with the following information: the number of contiguous files, the number of blocks occupied by contiguous files, the total number of files, and the total number of blocks occupied by all files. The program will not report on industry compatible magnetic tape units since they do not have a standard DOS file structure.

Restrictions: Has only been tested with multiple RK11 drives

Media Price Code: A1, F5, G12

MINIPIP-11

Author: Tom Adametz

Lincoln-Sudbury Regional High School, Sudbury, MA

Source Language: PAL-11A

Special Hardware Required: High speed reader and punch and line printer optional

Abstract: Minipip-11 (MINIature Peripheral Interchange Program for the PDP-11) can be used to set up a transfer between any paper device (TTY, HSR, HSP, LPT). The user has an option of 3 formats for the transfer, formatted or unformatted ASCII, or binary. Minipip can accommodate an 80-column or 132-column line printer.

Media Price Code: D4, F5, G30

ECAP

Author: Robert Michael Owens

Naval Weapons Laboratory, Dahlgren, VA

Source Language: FORTTRAN

Memory Required: 16K minimum

Abstract: NWL ECAP is a useful tool for the analysis and design of linear study state L (inductor), C (capacitor), and R (resistor) networks of twenty-five or fewer branches and ten or fewer nodes.

11-123

The basic electrical element is the branch which must include, at most, one passive element, which may be either a resistor, capacitor, or inductor. This branch may also include a current source, a voltage source, or a transconductor (a voltage-controlled current source).

As all the operator inputs are position free, the program is still very useful to the electrical engineer who is a novice at computer programming.

Restrictions: OTS Complex divider \$DVC error

Media Price Code: D2, G10, K27, M55

Format: Floppy-RT-11, Magtape-DOS-11

Interval Histogram Program V.003

11-127

Author: Fred E. Koch and Keith E. Davison for Marcel Verzeano, M.D.

Department of Psychobiology, University of California, Irvine, CA

Source Language: PAL-11

Memory Required: 8K

Special Hardware Required: KW-11 Real Time Clock, A-D Converter

Abstract: The Interval Histogram Program can acquire pulse train data from one or more analog channels simultaneously. The program can generate, in real time, interval histograms. The generated histograms may then be displayed on a scope or listed on the TTY. The channels are sampled at rates of 97 to 250 usecs. per channel, depending on the number of channels sampled. A special high speed pulse counting option is included to determine if pulses are being missed.

Media Price Code: A2, B6, F10

QUANDA

11-128

Author: G. Bernstein

McGill University, Montreal, Quebec, Canada

Operating System: DOS/BATCH V08.08

Source Language: MACRO-11

Memory Required: 260 words

Special Hardware Required: GT40 Display System

Abstract: QUANDA is a subroutine written for a DOS-based GT40 system which allows the user to simply program question and answer dialogs on the GT40 CRT. When called, it will display a user-specified question on the CRT, and if desired, will accept alpha or numeric information input from the console. Console input is echoed on the CRT, followed by a blinking cursor which moves to the right as each character is entered. In alpha mode, the entered character string is deposited in the user's buffer. In numeric mode, the binary equivalent of the decimal numeric input is retransmitted. Refresh of the current display is maintained until the next call to QUANDA.

Media Price Code: D2, G8

Single User BASIC, Version GEO8B

11-129

Author: Staff

Digital Equipment Corporation

Revised by: Larry W. Finger, Geophysical Laboratory, Washington, D.C.

Abstract: This version of Single User BASIC for the PDP-11 revised V008A to correct an error in the LIST command and to fix the faulty program flow that occurs when a GOSUB command is used on the same line as a FOR statement. The new Version also detects the improper nesting of FOR-loops, generating an ERROR 24 for this condition. Additional modifications include a new command, MERGE, for loading multi-tape source programs and a change in the user list processing to reduce the execution time by 70% or more for complicated programs. The

11-129 (Cont.)

extra speed is achieved by adding one extra word to each list item. The standard requirements are outlined in Appendix A of the BASIC programming manual, DEC-11-XBPMA-B-D.

No Source Available.

Media Price Code: A1, F8

VT, PDP-11 DOS Compatible Driver for Tektronix 4010 Graphics Display Terminal

Author: Carl Akerlof and Mark Taylor
Randall Laboratory of Physics, University of Michigan, Ann Arbor, MI
Operating System: DOS/BATCH
Source Language: MACRO-11
Special Hardware Required: Tektronix 4010 Graphics Display Terminal

Abstract: VT is a DOS compatible driver which allows the use of a Tektronix 4010 Graphics Display Terminal as an alphanumeric input device and as both an alphanumeric and graphics output device. This driver may be edited into the DOS CIL (Core Image Library) so that the Tektronix terminal may be accessed via the standard DOS I/O macros.

Media Price Code: A1, B4, H32

Format: DOS-11

CALEND—Calendar Generator

Author: Thomas Powers
Hendrix Electronics, Manchester, NH
Source Language: PAL-11A
Memory Required: 850 words

Abstract: CALEND is a simple program which accepts a decimal year value from the teletype and prints out a 12 month calendar for that year on the teletype or line printer. The digits of the year are blocked out in a 8×8 matrix to display the year as a header.

Note: Listing on paper tape

Media Price Code: A2, F5, G32

TED-11A, Text Editor

Author: Joseph Kocanowski
Stephens Institute of Technology, Hoboken, NJ
Source Language: PAL-11
Special Hardware Required: High speed reader and punch

Abstract: A modified version of ED-11 (DEC-11-UEDPA-A-LA), DEC's PDP-11 Paper Tape Software Text Editor. It accepts a series of commands typed on a single line. In addition several commands have been altered slightly to extend their usefulness.

Restrictions: Cannot be used on system having only LSR and LSP

Media Price Code: A2, B7 F5, G42

COLIST

Author: James H. Stein
Security General, Sunnyvale, CA
Operating System: DOS/BATCH
Source Language: MACRO-11

Abstract: "COLIST" is six-characterese for "Column Lister." Given an ASCII input file consisting of a large number of (presumably rather short) lines, "COLIST" creates an ASCII output file representing the same text as a series of "pages," with several "columns" on each page.

The column width, number of columns per page, number of lines per page, and inter-column spacing are all specified by the user.

Note: DECTape includes DECUS 11-134

Media Price Code: D2, H32

Format: DOS-11

11-130

GONIF

Author: James H. Stein
Security General, Sunnyvale, CA
Operating System: DOS/BATCH
Source Language: MACRO-11
Memory Required: 8K

Abstract: The DOS program GONIF (Hebrew for "thief") provides a convenient collection of routines to read, examine, and modify data on a block-structured device (disk, DECTape).

With GONIF, one can easily modify creation dates or protection codes of (any) files, perform word searches through linked or contiguous files, sort file directories by file name, access cylinders 200 & 201 on RK05 drives, delete one of a pair of files which DOS has gotten tangled, copy/verify DECPacks, and/or totally clobber the system disk.

Note: DECUS 11-133 and 11-134 are on same DECTape.

Media Price Code: A2, B3

Format: DOS-11

11-131

TGH GAMMA-11 Package—HEAD, STOM, RENO

11-135

Author: T. D. Cradduck
Toronto General Hospital, Toronto, Ontario, Canada
Submitted by: Charles Merrill
Digital Equipment Corporation, Maynard, MA
Operating System: GAMMA-11
Source Language: FOCAL
Memory Required: 16K
Special Hardware Required: GAMMA-11 System

Abstract: HEAD compares curves obtained for each side of the head during a cerebral circulation study. Input is ROI curves and output is ratio of amplitudes, slopes, times to peak and plateaus. Their parameters give a value to be associated with a visual inspection of the curves.

STOM corrects ROI curve from stomach emptying procedure for decay $In - 113m$, then plots resulting curve on LA30 to allow for calculation of $T_{1/2}$.

RENO—ROI curves are adjusted for area and blood background curve subtracted. Resulting curves are stored back into Save area plus 1.

Media Price Code: D1

11-132

THYR

Author: Dr. T. D. Cradduck
Toronto General Hospital, Toronto, Canada
Submitted by: Charles Merrill
Digital Equipment Corporation, Maynard, MA
Operating System: GAMMA-11
Source Language: FOCAL
Memory Required: 16K
Special Hardware Required: GAMMA-11 System, Automatic sample changer with paper tape O/P

11-136

Abstract: This program is used to calculate values of effective thyroxine index (ETI's) and T4 assay from prepared punched paper tapes from an automatic sample changer (gamma counter).

Media Price Code: D2, G10

| | | | |
|---|---------------|---|---------------|
| BOOT | 11-137 | FXSUBS | 11-141 |
| <i>Author:</i> Robert Farmer | | <i>Author:</i> David L. George | |
| University of California at San Francisco, San Francisco, CA | | Medical College of Pennsylvania, Philadelphia, PA | |
| <i>Submitted by:</i> Charles Merrill | | <i>Submitted by:</i> Charles Merrill | |
| Digital Equipment Corporation, Maynard, MA | | Digital Equipment Corporation, Maynard, MA | |
| <i>Operating System:</i> GAMMA-11 | | <i>Operating System:</i> GAMMA-11 | |
| <i>Source Language:</i> FOCAL | | <i>Source Language:</i> FOCAL | |
| <i>Memory Required:</i> 16K | | <i>Memory Required:</i> 16K | |
| <i>Special Hardware Required:</i> GAMMA-11 System | | <i>Special Hardware Required:</i> GAMMA-11 System | |
| <i>Abstract:</i> When using FOCAL G-11, the absolute loader and bootstrap loader are usually destroyed. This program will restore the bootstrap and thereby facilitate the loading of overlay and other programs. | | <i>Abstract:</i> Several FOCAL subroutines that may be of use in conjunction with user generated programs. Each set uses the FX (Unibus) function to obtain values from or change values at particular locations on the Unibus. | |
| <i>Media Price Code:</i> D1, G10 | | <i>Media Price Code:</i> D1, G6 | |
| FODT | 11-138 | UPTK | 11-142 |
| <i>Author:</i> Robert Farmer | | <i>Author:</i> David L. George | |
| University of California at San Francisco, San Francisco, CA | | Medical College of Pennsylvania, Philadelphia, PA | |
| <i>Submitted by:</i> Charles Merrill | | <i>Submitted by:</i> Charles Merrill | |
| Digital Equipment Corporation, Maynard, MA | | Digital Equipment Corporation, Maynard, MA | |
| <i>Operating System:</i> GAMMA-11 | | <i>Operating System:</i> GAMMA-11 | |
| <i>Source Language:</i> FOCAL | | <i>Source Language:</i> FOCAL | |
| <i>Memory Required:</i> 16K | | <i>Memory Required:</i> 16K | |
| <i>Special Hardware Required:</i> GAMMA-11 System | | <i>Special Hardware Required:</i> GAMMA-11 System | |
| <i>Abstract:</i> Allows the user to search and/or dump the contents of a specified area of core. It is useful for locating data or program routines without disturbing either. FODT uses octal input and output via the keyboard device. | | <i>Abstract:</i> UPTK calculates percent uptake. It is valid for such studies as thyroid uptakes and T3's. | |
| <i>Media Price Code:</i> D1, G5 | | The program is designed for KB: data input. It is particularly useful for studies where most of the input parameters are the same from study to study. This is true, for example, in T3 calculations where only the patient source count changes. Other parameters of the study are moved from run to run by striking the altnode terminator upon request for data input. | |
| QANDA | 11-139 | <i>Media Price Code:</i> D1, G5 | |
| <i>Author:</i> J. Anthony Parker, M.D. | | STIRS, Self-Training Interpretive and Retrieval | 11-143 |
| Peter Bent Brigham Hospital, Boston, MA | | System Programs For Mass Spectral Data | |
| <i>Submitted by:</i> Charles Merrill | | <i>Author:</i> G. M. Pesyna, R. Venkataraghavan and F. W. McLafferty | |
| Digital Equipment Corporation, Maynard, MA | | Cornell University, Ithaca, NY | |
| <i>Operating System:</i> GAMMA-11 | | <i>Operating System:</i> DOS/BATCH | |
| <i>Source Language:</i> PAL-11 | | <i>Source Language:</i> FORTRAN IV and MACRO-11 | |
| <i>Special Hardware Required:</i> GAMMA-11 System or Standard Tektronix 611 Interface | | <i>Memory Required:</i> 16K | |
| <i>Abstract:</i> A general purpose, reentrant, FORTRAN compatible, assembly language question, and answer subroutine, offers FORTRAN and assembly language programmers the easy use of the Tektronix 611 scope and teletype for textual input/output. Answers are typed in by the user at the teletype. Questions and answers are displayed on the 611 scope. Question fields are set up by the programmer as simple text strings. Answer buffers are likewise returned as text strings. Several options are available. | | <i>Special Hardware Required:</i> High-speed Paper Tape Reader and Punch, 2 RK05 Disk Drives | |
| <i>Media Price Code:</i> D4 | | <i>Abstract:</i> The STIRS software has two major programs. The first condenses the unknown spectrum using specific procedures to correspond to the unpacked format of the reference spectra. The second program does the actual matching of the unknown spectral data with that in the data base. A match factor is computed for each class of data, indicating the degree of similarity of the unknown to that in the reference file. | |
| SQRS | 11-140 | <i>Media Price Code:</i> A2, B4, G60 | |
| <i>Author:</i> David L. George | | DELFIL, Delete A File From FORTRAN | 11-144 |
| Medical College of Pennsylvania, Philadelphia, PA | | <i>Author:</i> Herbert J. Bernstein | |
| <i>Submitted by:</i> Charles Merrill | | Brookhaven National Laboratory, Upton, Long Island, NY | |
| Digital Equipment Corporation, Maynard, MA | | <i>Operating System:</i> DOS/BATCH V9.19 | |
| <i>Operating System:</i> GAMMA-11 | | <i>Source Language:</i> MACRO-11 | |
| <i>Source Language:</i> FOCAL | | <i>Memory used:</i> 162 ₈ bytes | |
| <i>Memory Required:</i> 16K | | <i>Other Software Required:</i> FORTRAN OTS V20, PRMR5.MAC, PRMPC.MAC, PRM.MAC, MAP.MAC needed to assemble source | |
| <i>Special Hardware Required:</i> GAMMA-11 System | | | |
| <i>Abstract:</i> SQRS calculates a least-squares straight line from user selected points on a ROI curve. Parameters of the line, including confidence limits, are output to the KB. | | | |
| <i>Media Price Code:</i> D2, G5 | | | |

11-144 (Cont.)

Abstract: DELFIL is a subroutine to be called from a FORTRAN program to delete a file by:

CALL DELFIL (IUN, IERR)

where IUN is the unit number, and IERR will be 0 if the file was deleted. ASSIGN or SETFIL should be used if files other than the defaults are to be deleted.

Note: Can also be used under DOS V08.08 by putting \$SRV and \$CAL from OTS V20 into library.

Media Price Code: D2, F5, G5

X-RAY: An On-Line Program for Automatic Electron Microanalysis of Oxides and Silicates Using a Si (Li) Spectrometer

11-145

Author: R. J. Gehrke and R. C. Davies
Aerojet Nuclear Company, Idaho Falls, ID

Source Language: FORTRAN IV

Special Hardware Required: 16K PDP-11 with Disk and DECTape

Abstract: X-RAY is an on-line, FORTRAN program for the automatic electron microanalysis of silicates and oxides. It is written for a PDP-11 computer having 12K of core in addition to disk, drum or magnetic tape storage. Energy dispersive x-ray data is acquired with a Si(Li) spectrometer mounted on a scanning electron microscope (SEM) or an electron microprobe. The data is transferred from the acquisition instrument through an interface to the PDP-11 computer for on-line processing or is stored on paper tape or magnetic tape for later batch processing. X-RAY automatically locates the x-ray peaks in a spectrum, determines the elements associated with the x-ray peaks and calculates their relative abundances through a least-squares fit of the spectrum with spectra of element oxide standards (i.e., components). In this application of least-squares fitting, the component spectra are obtained from the electron excitation of simple oxide standards whenever possible or from multi-element oxide or silicate standards. The contributions of each component spectrum are expressed as ratios of composite to component spectrum. Finally, the ratios are corrected for matrix effects to yield the percent concentration of each element oxide in the sample. The appendices include a descriptive program handbook for the user, a list of the program commands with their functions, the link modules, the format requirements for data to be input to the computer, a detailed flow chart of the program and a complete program listing.

Media Price Code: D8

PDM70 Support Routines

11-146

Author: S. R. Alpert and Ph.D. and R. Hully
HIAS, Inc., Worcester, MA

Operating System: RT-11

Source Language: MACRO-11

Memory Required: 12K minimum

Other Software Required: BASIC/RT-11 or BASIC/PTS

Abstract: These routines allow the user to fully utilize the PDM70 (Programmable Data Mover) using BASIC. Commands to the PDM70 are easy to construct and interpret. Numerous error diagnostics aid the programmer when attempting to illegally program the PDM70.

Documentation on Media.

Media Price Code: A2, B5, F8, G26, H32, L33

Format: DOS-11

AMD—CDC 200 UT Simulator

11-147

Author: G. H. Campbell, H. B. Chiang, T. V. Willoughby and H. J. Bernstein

Brookhaven National Laboratory; Upton, Long Island, NY

Operating System: DOS/BATCH V08.08 or V09.19

Source Language: MACRO-11

Memory Required: DOS + 9K + 2K EMTs + drivers + buffers

Abstract: AMD simulates a Control Data Corporation ANSI or BCD series user terminal for remote batch and interactive work via synchronous 2000 baud half duplex telephone lines. The CDC mode 4C protocol is used. DOS data sets may play the role of card reader and line printer.

Restrictions: Requires change in keyboard driver (supplied). Does not handle DIAGNOSTIC WRITE message.

Media Price Code: A2, B12, F26, G48, H32

Format: DOS-11

RSX-11D Core Dump

11-148

Author: Jim Serwer

Moore Systems, Inc., Sunnyvale, CA

Operating System: RSX-11D

Source Language: MACRO-11

Memory used: 2200₈ bytes

Special Hardware Required: Printing Device

Abstract: CDP is a rudimentary core dump program for use with RSX-11D. It may be called with an MCR command; or, if fixed in memory, it may be started from the toggle switches following a system crash.

It accepts only physical addresses, dumps at most 4K words at a time, prints only in octal word format and does not spool output.

Media Price Code: D2, G14

SNPDMP

11-149

Author: Jim Serwer

Moore Systems, Inc., Sunnyvale, CA

Operating System: RSX-11D

Source Language: MACRO-11

Memory Required: 1600 Octal bytes

Special Hardware Required: Printing Device

Abstract: SNPDMP, Snapshot Core Dump, is a routine to dump a portion of memory during execution of a RSX-11D task. Its object module is included in the task build of the task to be dumped. It may be called in either of two ways: 1) A JSR instruction or 2) if properly initialized, by a synchronous trap (e.g., segment fault, odd address, etc.).

Media Price Code: D2, G8

RFSAV and RFRST

11-150

Author: Jim Serwer

Moore Systems, Inc., Sunnyvale, CA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory used: 756, 726 octal bytes

Special Hardware Required: RF and RK disks

Abstract: RFSAV saves an RF disk image in a continuous DOS-11 file on an RK disk. RFRST is a companion program which restores the RF disk from the RK file.

These programs will become obsolete when ROLLIN is modified to perform this function.

Media Price Code: D2, G10

FFT—A Conversational Fast Fourier Transform*Author:* H. J. Morrison

Naval Underwater Systems Center, New London, CT

Operating System: DOS/BATCH V004A*Source Language:* PAL-11*Memory Required:* 16K*Special Hardware Required:* EAE-KE11A, RC11-64 disk, DEC-tape, VR-14

Abstract: Access to a Fast Fourier Transform is provided for users of a PDP-11. Input can be from a teletype or a high-speed paper tape reader. Output is to a teletype or a VR-14 point plot display.

Media Price Code: D4, H32*Format:* DOS-11**GAMMA-11 Package: VQ, MTT, QPQS, XEBH***Author:* D. S. Ahnberg, S. Treves, M.D. and D. L. Maltz, M.D.

Children's Hospital Medical Center, Boston, MA

Operating System: GAMMA-11*Source Language:* FOCAL*Special Hardware Required:* GAMMA-11 System

Abstract: VQ calculates and displays ventilation/equilibration, perfusion/equilibration and ventilation/perfusion ratios from dynamic lung studies.

MTT calculates the mean transit time of hemodynamic flow, based on a least-squares fit to the gamma variate function.

QPQS calculates the QPQS using the pulmonary transit curve from radionuclide angiography.

XEBH calculates percent distribution of regional lung ventilation, equilibration (volume) and perfusion from xenon-133 lung studies conducted according to the method of Ball.

Media Price Code: A1, G18**SMOT***Author:* Dr. Ulrich B. Noelpp

Inselspital Bern, Bern, Switzerland

Operating System: GAMMA-11*Source Language:* FOCAL*Special Hardware Required:* GAMMA-11 System

Abstract: The program SMOT is an adaptation of 3 routines which are collected in the IBM-SSP (360A-CM-03X) under the names SE13, SE15 and SE35. It does smoothing of ROI-Curves, using a local least-square-fit to a polynomial. Input is a set of ROI-curves in a Save-Register and Control-Information from the keyboard. Output are curves which can again be saved in a register.

Media Price Code: D2, G5**DEXP***Author:* Dr. Ulrich B. Noelpp

Inselspital Bern, Bern, Switzerland

Operating System: GAMMA-11*Source Language:* FOCAL*Special Hardware Required:* GAMMA-11 System

Abstract: Program DEXP performs a double-exponential fit to a set of data points. It is a FOCAL adaption of a FORTRAN Program. Double-exponential-curves-analysis can be important for renal clearance investigations, cerebral blood flow measurements and other functional studies in nuclear medicine. The present Version 1 is a pure off-line program with keyboard data entry, curve presentation on the VTO 1 and LA80 output. Raw data curve and filled output curve can be saved in a Save-Register. Numerical output are the parameters of the filled exponentials and their half-lives.

Media Price Code: D2, G5**11-151****RADIX—Base Conversion Routine***Author:* Daniel H. Anderson

Johnson Space Center, NASA, Houston, TX

Operating System: DOS/BATCH*Source Language:* FORTRAN IV

Abstract: This program will convert a number expressed in one base system to a number having the same value expressed in another base system. Any input and output bases may be used from 2 to 36. The input and output character strings may be up to 25 characters long, and may include a point. The characters A through Z are used to represent the values 10 through 35.

Media Price Code: D2, F8, G5**DOS FOCAL, DOS DRIVERS and LIST-11****11-156***Author:* Glenn C. Everhart and MIT CIPG Group

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Abstract: DOS FOCAL is a version of DEC paper-tape FOCAL with a few extensions (extended math, library routines) that runs under PDP-11 DOS. All features are preserved, and I/O to any DOS datasets may be performed.

TA.MAC is a driver for an extra DOS console. Paper tape is not supported, but type-ahead is, and nonzero fill counts may be handled.

DVGB.MAC is a driver for a "garbage device" for DOS. When incorporated into DOS, device GB: will throw away all output written onto it, and give endfiles on input after a finite amount of random data.

LIST-11 is a multi-column ASCII file reformatter. Files may be reformatted into up to 6 columns on any page size. Switch options allow tabs to be treated as single or multiple spaces, headers to be printed/omitted, long lines to be truncated/wrap-around, and cases to be translated to upper case or not. If zero columns are specified, LIST-11 formats text into as many columns as fit into the page size given without wraparound. Form feeds on input may be ignored or used to go to the next column. Up to 61 lines 132 columns across may be treated (easily increased by reassembly).

Media Price Code: A2, H32*Format:* DOS-11**RSX-11D Task Package****11-157***Author:* Robert H. Douglas

General Electric Company, Louisville, KY

Operating System: RSX-11D*Source Language:* MACRO-11

Abstract: A. ODT Initiate Task—The ODT Initiate Task is used to initiate the On-Line Debug and Test routine in a task that has suspended unexpectedly, is running out of control, or does not have any breakpoints. The task is useful for regaining control over programs in tests that have run wild.

The ODT initiate function is identical to the "SET" function described in the Version 1 release of RSX-11D but never implemented.

B. Print Task Status Program—STATUS is a task that outputs information as to the current status or any task in the system. The program lists the task's running status (OFF, RUN, CHECKPOINTED, etc.), the pool usage, and AST and Send Data message status. For active tasks the priority, partition name, I/O usage, and event flags are also output.

STATUS differs from the DEC-supplied ACT function in that only one task status is listed and the output format is more readable.

C. File Change Program—This program allows alterations to the contents of a file one word at a time. Data may be input in octal, decimal, ASCII, or as Radix-50 characters. The program has a special mode for patching task-image files, that allows the user to address task virtual addresses and not be concerned with file headers or block boundaries. (However, the program does not properly address overlays.)

*Documentation on Media.**Media Price Code:* D7, M55*Format:* DOS-11

STAGE 2 For The PDP-11*Author:* W. M. Waite*DOS-11 Implementation by Peter H. Heinrich, University of Karlsruhe, Inst. f. Biokybernetic, D-75 Karlsruhe, Germany
University of Colorado**Operating System:* DOS/BATCH*Source Language:* MACRO-11*Memory Required:* Uses all core available*Special Hardware Required:* PDP-11/20 + EAE, PDP-11/40 + EIS or PDP-11/45*Abstract:* STAGE2 is a general purpose macro processor similar to ML/1 (DECUS No. 11-69). The features are described in William M. Waite's book "Implementing Software for Non-numeric Applications," Prentice-Hall, N.J., 1973.*Documentation on Media.**Media Price Code:* A1, H32*Format:* DOS-11**READID.MAC****WITHDRAWN***Note:* Order DECUS No. RSTS11-36.**1401 Simulator***Author:* Edward Geigler

Carleton College, Northfield, Minnesota

Submitted by: Alice Peters

Digital Equipment Corporation, Maynard, MA

Source Language: MACRO-11*Abstract:* The 1401 Simulator runs 1401 programs on the PDP-11. The maximum 1401 machine configuration which can be simulated is: 16K 1401 with Sense Switches B-G, high-low equal compare, indexing, modify address, start A and B-address registers, move characters to record-mark or group-mark-wordmark, scan disk and direct seek, 1402 card reader/punch, 1403 line printer, 1407 console inquiry station, and up to five 1311 disk drives.*Media Price Code:* A8, H32*Format:* DOS-11**CHSSLV: A CHESS-PROBLEM SOLVER***Author:* Ir. R. C. Van Der Eijk

Hogere Technische School, Heerlen, The Netherlands

Operating System: RT-11*Source Language:* MACRO-11*Abstract:* This program solves chess problems. White checkmates black in 2 or 3 moves.

Casting and "En Passant" are forbidden moves.

Media Price Code: D2, G24, K27*Format:* RT-11**Clock Generator***Author:* Mike Rudnick

Tektronix, Inc., Beaverton, OR

Source Language: MACRO-11*Special Hardware Required:* Line Frequency Clock*Abstract:* The Clock Generator is a group of routines which allow for convenient and flexible use of the PDP-11 line frequency clock. Clocks generated by the Clock Generator may be thought of as self-resetting alarm clocks.*Media Price Code:* D2, G5**11-158****MR11DX****11-165***Author:* David T. Boylan

ELS Systems Engineering, East Cleveland, OH

Source Language: MACRO-11*Memory Required:* 1/2K*Abstract:* MR11DX is an extended version (cassette boot included) of the MR11DB hardware ROM boot loader. It is intended for use in systems which have occasion to boot from many devices but do not have the hardware version; it can also be used in conjunction with the paper tape ROM boot loader to save cost and card space.*Media Price Code:* D1, F5, G5**11-159****CILINK—A Swapping Overlay Loader****11-166***Author:* R. N. Stillwell

Baylor College of Medicine, Houston, TX

Operating System: DOS/BATCH*Source Language:* MACRO-11*Memory used:* 1362 bytes (total)*Other Software Required:* LINK V.11, CILUS*Abstract:* CILINK is a FORTRAN-compatible swapping overlay loader which will run on a PDP-11/40 or PDP-11/45 under PDP-11 DOS V.08 or V.09. It allows an overlay to call another overlay into its own memory space, without losing the values of its local variables. It also allows recursive calls. The RK11 is a required peripheral.*Restrictions:* Not compatible with new LINK*Documentation on Media.**Media Price Code:* A1, H32*Format:* DOS-11**11-162****Real Time EXF for Single User BASIC****11-167***Author:* Stephen E. Edgell

University of Louisville, Louisville, KY

Source Language: PAL-11A*Memory Required:* 8K*Other Software Required:* Paper tape software loader and assembler—DEC-11-L2PC-PO; DEC-11-UPLAA-A-PB Single User BASIC-DEC No. LIBKIT-11*Special Hardware Required:* DR-11C, clocks as stated in abstract*Abstract:* External event control and data recording are facilitated for the PDP-11 Single User BASIC paper tape software. The control of one DR11C interface is supported. Timing control including delaying of execution and recording of external latencies are supported by version 1 using the line frequency clock and by version 2 using the programmable real time clock. User programming is in BASIC with function references to this EXF for real time actions.*Media Price Code:* D2, G18**11-164****PDP-11 Program to Load Card Output Produced by the Wang IBM 370/PDP-11 Cross Assembler and Linker****11-168***Author:* E. H. Spencer

Exxon Company, Baton Rouge, LA

Abstract: The Wang 370/PDP-11 Cross Assembler and Linkage Editor, when assembling and linking PDP-11 programs on an IBM 370 computer, punches a PDP-11 object module to cards in the Absolute Binary Loader (V006A) format. This DECUS Library entry provides a

11-168 (Cont.)

bootstrap and a modification of the DEC Absolute Binary Loader (V006A) to allow the Documentation 300 card reader to read and store these load modules to PDP-11 memory.

Restrictions: Not relocatable, but can be changed for different core sizes

Media Price Code: D2, R30

Tri-Data Paper-Tape PAL-11A Assembler

Author: Jack R. Ellis

Tri-Data Corporation, Mountain View, CA

Source Language: PAL-11A

Special Hardware Required: Supports high-speed reader/punch, line-printer

Abstract: This program is a revised paper-tape PAL-11A assembler for PDP-11 computers. Additional features include true double-buffering of source, binary, and listing data for maximum throughput; 11/40 and 11/45 extended instruction handling; line-printer listing output; and a wide-line listing format that allows multiple-word instructions to be printed on one line. This assembler operates in 4K to 28K of memory and handles up to 7000 symbols.

Media Price Code: A1, B12, F8, G72

DOS/RT-11 9-Track Magtape Generate/Read Programs for UNIVAC

Author: Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: DOS/BATCH or RT-11

Source Language: FORTRAN with FLD functions

Other Software Required: NTRAN and ERTRAN in UNIVAC FORTRAN library

Special Hardware Required: 9 track magtape drive on both UNIVAC and PDP-11

Abstract: A library of four (4) programs that when run on a UNIVAC 1108 or 1110 allows a user to generate or read a 9-track magtape in either DOS or RT-11 format. The generating programs will take any mix of UNIVAC DATA files and FILE ELEMENTS and put them on 9-track magtape in the format wanted on a one for one basis—one UNIVAC DATA file or FILE ELEMENT will produce one tape file. The magtape reading programs will transfer the selected tape files to UNIVAC DATA FILES. These programs will handle ASCII files only—binary files cannot be handled.

The source for the four (4) programs comes as a card deck ready to be run on a UNIVAC with only the addition of a @RUN card. This deck, when run, creates a new file USER*FILE. into which is put the source listings for the four (4) main programs and six (6) subroutines, their respective relocatable binaries and the four (4) executable absolute binaries.

Media Price Code: D2, H32, R70

Format: DECsystem-10

DEAS

Author: G. Everhart

P. O. Box 402, Upton, Long Island, NY

Operating System: DOS/BATCH V08 or V09

Source Language: MACRO-11

Abstract: DEAS is useful for the program which does PAUSES a lot and requires users to assign datasets to do its I/O. It will remove any part of the Device Assignment Table built since a program began running and free the associated memory. Thus it enlarges the size of the largest

possible program by enabling it to get by with less memory for assignments. It will also help reduce fragmentation of DOS buffers caused by such assignments while drivers are still in core.

FORTRAN and assembly language calls are provided.

Media Price Code: D1, G5

RTDOS

11-172

Author: Glenn C. Everhart

P. O. Box 402, Upton, Long Island, NY

Operating System: DOS/BATCH V08 or V09

Source Language: MACRO-11

Abstract: RTDOS-PAL provides DOS-11 with the ability to call a user subroutine upon completion of a read or write, thus enabling it to do "real-time" I/O. Because DOS allows multiple output files to be open at a time on a device, this makes it the system of choice for real-time applications in many situations.

Restrictions: Not tested for DOS V4. Patch does not survive ↑ C KILL; method for allowing it to is given in document.

Media Price Code: D2, G5

MOONLANDER (LEM)

11-173

Author: Jack Burness

Submitted by: John Mucci

Digital Equipment Corporation, Maynard, MA

Source Language: MACRO-11

Special Hardware Required: GT40 or equivalent; KW11-L Line Clock

Abstract: Moonlander is an interactive graphical simulation of a Lunar Excursion Module (LEM) landing on the lunar surface. The program requires a GT40 or equivalent. The program runs in real time, solving differential equations of motion by integration. The result is a highly interactive and instructional experience.

Media Price Code: A1, F10, H32

Format: DOS-11

STAR-TREK (SPACWR)

11-174

Author: Mike Mayfield

FORTRAN IV version by Kay R. Fisher, Digital Equipment Corporation, Maynard, MA

Centerline Engineering

Operating System: RT-11

Source Language: FORTRAN IV

Memory Required: 12K

Abstract: This program simulates the TV program "STAR-TREK."

Media Price Code: D2, G22, K27

Format: RT-11

DC.MAC—R C Disk Driver for RT-11

11-175

Author: Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11 V02

Source Language: MACRO-11

Special Hardware Required: PDP-11 RC disk

Abstract: This program, when assembled, linked and entered into the monitor device tables, allows the RT-11 user to access an RC disk as a non-system device-file structured unit.

Media Price Code: D2, G5

RUN.MAC/SSWTCH.MAC*Author:* Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11*Source Language:* MACRO-11*Other Software Required:* RT-11 V02-01A FORTRAN*Abstract:* Implementing CALL RUN and CALL SSWTCH to RT-11 FORTRAN.

When used in a FORTRAN program, the CALL SSWTCH is identical to the DOS version. The CALL RUN differs from the DOS version in that the file you wish to call up must be specified in RADIX50 format.

Media Price Code: D2, G5**PARITY.MAC—High Speed Even (Odd) Parity****Paper Punch Driver***Author:* Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11 V02-01A*Source Language:* MACRO-11*Special Hardware Required:* High speed paper tape punch*Abstract:* This program, when assembled, linked, and entered into the monitor driver tables, allows the user to punch paper tapes in either even or odd parity (depending on how the program was edited), the parity punch being used in the same way as any other I/O device. The final driver for the even parity punch being called EP.SYS and the driver for the odd parity punch OP.SYS.*Media Price Code:* D2, G5**CDA—Crash Dump Analyzer***Author:* Robert H. Douglas

General Electric Company, Louisville, KY

Operating System: RSX-11D Version 4A (only)*Source Language:* MACRO-11*Other Software Required:* 20K₁₀*Special Hardware Required:* Magtape, DECTape or RK05*Abstract:* CDA is a crash dump analyzer for RSX-11D Version 4A. The program produces a number of separate reports on various aspects of the system contained in the crash dump. The crash image may be obtained from a dump taken by the resident crash module. . . . CRSH, a user-written on-line dump routine, or from the file written by the MCR SAVE command. The crash image may be stored on a DK, DT, or MT.

Reports are available on the contents of registers and the kernel stack at the instant of crash, a listing of the System Task Directory, the status of all active tasks, a map of the machine's memory, the status of all I/O devices, a list of all entries in the Clock Queue, and a list of all free nodes. The user may select one or more reports for output.

Restrictions: This program will be made obsolete by RSX-11D Version 6*Media Price Code:* A2, F26, G90, H32, M55*Format:* DOS-11**Fast Fourier Transform Routine***Author:* Robert Day*Submitted by:* Charles A. Rossier

Digital Equipment Corporation, Maynard, MA

Operating System: DOS/BATCH or RSX-11*Source Language:* MACRO-11*Memory used:* 1400 words*Abstract:* FFTR is a PDP-11 assembly language subroutine which performs a 16-bit precision forward or inverse Fast Fourier Transform of N real-valued data points, where N is a power of 2 in the range**11-176**

(16 < N < 2048). A sample size of 2048 points is transformed in 1.21 seconds on a PDP-11/20 with EAE. Accuracy is preserved by scaling only when overflow occurs. FFTR requires about 1400 words of memory, exclusive of the user supplied N + 2 word buffer. It can be called from FORTRAN under DOS or RSX-11D/M or linked with an assembly language program. Versions are available for all PDP-11's and no hardware arithmetic unit is required. However, use of a hardware arithmetic unit greatly improves the speed of FFTR and special versions of the routine are available for machines which are equipped with EAE or EIS.

Media Price Code: A2, H32, K27*Format:* DECTape-DOS-11, Floppy-RT-11**11-177****CAREERS****11-180***Author:* H. R. Taylor and P. D. Shaw

University of Manchester Institute of Science and Technology, Manchester, England

Source Language: BASIC*Memory Required:* 8K*Abstract:* This program asks the user a number of questions about his/her interests and educational attainments and from the results computes his overall ability and best subject group. (All available subjects are divided into nine groups.) It then asks about the type of work the user would like, e.g., "do you want to work with people?" and for each affirmative answer suggests a career. Too simple to offer serious careers guidance, but a popular game.*Media Price Code:* D2, G8**11-178****Modification of the RT-11 General Terminal Handler to Simulate Hard Copy Form Control****11-181***Author:* J. E. Bourne

The Dow Chemical Company, Midland, MI

Operating System: RT-11*Source Language:* MACRO-11*Memory used:* 256 Octal Words*Special Hardware Required:* LA30 DECwriter or equivalent*Abstract:* The RT-11 general terminal handler has been modified to provide form-controlled output to an LA30 DECwriter. The altered handler is still compatible with the RT-11 system monitor. Implementation requires replacement of the original handler on the mass storage device and patching the system monitor table \$ HSIZ to indicate the increased handler size, followed by a reboot of the system.*Media Price Code:* D2, G6**11-179****LPS-11 IOX Package****11-183***Author:* C. Petrovic

Rutgers University, College of Engineering, New Brunswick, NJ

Operating System: PTS-11 Paper Tape Operating System*Source Language:* PAL-11S*Memory Required:* 8K*Special Hardware Required:* IPS-11 System with LPSAD-12 A-D Converter, LPSKW RT Clock*Abstract:* This program allows Analog-to-Digital conversions to be performed under control of standard IOX calls. It allows for selection of channels, clock rates and sequential channel sampling.*Media Price Code:* D2, F10, G26

Gradient-Scintigraphy*Author:* Dr. Ulrich B. Noelpp*University Hospital Bern, Bern, Switzerland**Operating System:* GAMMA-11*Source Language:* GAMMA-11 Command Language*Special Hardware Required:* GAMMA-11 System (EVTL. plus 4601 hardcopy unit)**11-185**

the top of the next page. Therefore, the program FORM was written to simulate forms control while copying a listing from a mass storage device to a DECwriter or teletype. FORM counts printed lines and introduces the correct number of line-feeds in place of a form-feed. The line count is determined by line-feed characters in the text and by extra lines introduced by the DECwriter due to line overflow.

Media Price Code: D2, G5

Abstract: The operating procedure GRADSCI allows the nuclear medicine physician to visualize the in and outflow of a tracer from an organ-group. The procedure consists in a series of commands, which have to be given one after the other. The resulting images show gradients, fitted to straight lines.

Media Price Code: A2**Absolute Loader for DOS, RT-11 and RSTS****11-186***Author:* Martin Minow*Digital Equipment AB, Solna, Sweden**Operating System:* DOS/BATCH, RT-11 or RSTS*Source Language:* MACRO-11*Special Hardware Required:* high-speed paper tape reader or console with reader

Abstract: This version of the PDP-11 absolute loader can be linked and run by the DOS-11 or RT-11 monitors. In addition, it can be incorporated into the RSTS/E 'CIL' and loaded during initialization. When started, it resets the unibus, relocates itself to the top of memory, and starts reading from the paper tape reader (if there is one), or from the console keyboard reader.

Media Price Code: D2, G5**TAXRTN—Canadian Individual Income Tax Return****11-187***Author:* Simon H. Whitlow*Inland Waters Directorate, Environment Canada, Ottawa, Canada**Operating System:* RT-11*Source Language:* FORTRAN (RT-11)*Memory Required:* 16K

Abstract: This is a program to aid an individual in completing his personal T1 income tax form. The program prompts the user by asking questions and supplying references to the income tax filing guide. Multiple parameter entries are permitted with ease of use being a primary consideration. The output includes the formatted 4 pages of the income tax return together with schedule 1, the detailed tax calculation, and the Ontario tax credit form, if appropriate. The program is designed for the 1974 taxation year, but should be relatively simple to update.

Restrictions: Uses overlays under RT-11; can be run as (.LDA) core only

Media Price Code: D3, H32, L33*Format:* DOS-11**Forms-Control Simulation for DECwriters and Teletypes****11-188***Author:* Stephen N. Cole*Georgia Institute of Technology, Atlanta, GA**Operating System:* RT-11*Source Language:* MACRO-11*Special Hardware Required:* PDP-11/40, Mass Storage Device, DECwriter or teletype

Abstract: Several RT-11 system software programs (e.g., MACRO and DUMP) generate listings punctuated by form-feed characters. DECwriters and teletypes do not respond to form-feeds by spacing the paper to

FFTSC—16-Bit Complex FFT**11-189***Author:* Don Nelson*National Magnet Lab, Massachusetts Institute of Technology, Cambridge, MA**Operating System:* DOS/BATCH*Source Language:* MACRO-11*Memory used:* 398 words

Other Software Required: IQSIN (IQSIN2 or IQSIN4) DECUS No. 11-190 or DECUS No. 11-191

Special Hardware Required: PDP-11/20 or PDP-11/40; KE11A EAE or KE11-E EIS

Abstract: FFTSC is a radix-2 complex 16-bit Fast Fourier Transform for the PDP-11/20 with EAE or the PDP-11/40 with EIS. A 1024-point FFT takes 1.4 seconds on the 11/20, 1.0 seconds on the 11/40. Trigonometric factors are calculated as needed, rather than stored in a fixed quarter-wave table. The addresses of real and imaginary arrays are passed to FFTSC as arguments.

Media Price Code: D2, G10**ISNCS2 and IQSIN2—16-Bit Trigonometric Functions****11-190***Author:* Don Nelson*National Magnet Lab, Massachusetts Institute of Technology, Cambridge, MA**Operating System:* DOS/BATCH*Source Language:* MACRO-11*Memory used:* ISNCS2: 41 words; IQSIN2: 75 words*Special Hardware Required:* PDP-11/20; KE11-A EAE

Abstract: ISNCS2 has entries ISIN(I,J) and ICOS(I,J) for the computation of 16-bit sine and cosine of $(\pi/2)^*(I/J)$, where I and J are 16-bit integers and the returned values are the appropriate trigonometric values scaled up by a factor of 2^{**15} .

IQSIN2 has a lower-level entry, IQSIN(I,J), for calculation of the 16-bit sine in the first or fourth quadrants only. A seventh-order Chebyshev approximation is used to calculate that sine in 222 microseconds with a maximum error of 1.60 least significant bit.

Media Price Code: D2, G8**ISNCS4 and IQSIN4—16-Bit Trigonometric Functions****11-191***Author:* Don Nelson*National Magnet Lab, Massachusetts Institute of Technology, Cambridge, MA**Operating System:* DOS/BATCH*Source Language:* MACRO-11*Memory used:* ISNCS4: 41 words; IQSIN4: 65 words*Special Hardware Required:* PDP-11/40; KE11-E EIS

Abstract: ISNCS4 has entries ISIN(I,J) and ICOS(I,J) for the computation of 16-bit sine and cosine of $(\pi/2)^*(I/J)$, where I and J are 16-bit

11-191 (Cont.)

integers and the returned values are the appropriate trigonometric values scaled up by a factor of 2^{**15} .

IQSIN4 has a lower-level entry, IQSIN(I,J), for calculation of the 16-bit sine in the first or fourth quadrants only. A seventh-order Chebyshev approximation is used to calculate that sine in 185 microseconds with a maximum error of 1.60 least significant bit.

Media Price Code: D2, G8

SPACE WAR

Author: William Seiler and Lawrence Bryant
SYCOM, University of South Florida, Tampa, FL
Source Language: PAL-11S
Memory Required: At least 4K
Special Hardware Required: PDP-11/10, 4 channels of AD01-D, the first 4 channels of AA11-D, a teletype and a large screen oscilloscope

Abstract: A program, used in conjunction with a large screen oscilloscope, to create a game where two contestants maneuver spacecraft and battle for points on the screen. Variables include the number of torpedoes each spacecraft has, the number of hits to destroy a spacecraft, and whether there exists a sun and gravity.

Restrictions: Users must construct simple controllers for each of the two spacecraft

Media Price Code: A2, F30, G76, K27
Format: RT-11

TERM.MAC—Terminet Device Driver for PDP-11/20, DOS V8.02

Author: A. B. Dargis
Bell Laboratories, Murray Hill, NJ
Operating System: DOS/BATCH
Source Language: MACRO-11
Special Hardware Required: PDP-11/20; Terminet 1200 with horizontal and vertical tab option.

Abstract: A device driver subroutine for the Digital Equipment Corporation's PDP-11/20 Disk Operating System (DOS), originally written for the ASR33 teletype, has been modified to accommodate the G. E. Terminet 1200 KSR data terminal. The Terminet's higher transmission rate (120 characters/sec) requires different timing considerations than the ASR33 teletype. Special characters are assigned to set the optional horizontal tabs and the form feed control has been modified to use the Terminet's optional form feed mechanism.

Media Price Code: D2, G14

KA—The Small Console Driver

Author: G. Everhart and Keith Rich
Massachusetts Institute of Technology, Cambridge, MA
Operating System: DOS/BATCH
Source Language: MACRO-11 (PAL-11 OK)

Abstract: KA.MAC is the source of a DOS V8 or later driver that takes over the console interrupt vectors and allows console I/O with a much smaller driver than the DEC KB driver. Paper tape is not supported, and no fill characters are added, but the driver works for teletype-compatible terminals. It uses a 64-character line, is smaller than the DEC driver, and follows the KB conventions for control-U and rubout, ignores null or vertical tab, and echoes tabs as single spaces.

11-192

Typing control-Z causes the driver to indicate end-of-file on input. It may be used by programs instead of the KB driver to conserve space, as for large assemblies or links.

Restrictions: No fill count option; suitable for TTY and like consoles, but probably not good for all consoles

Media Price Code: D2, G10

PCP-11/MFT-11, DOS Timesharing and Catalogued Procedures**11-195**

Author: G. Everhart and S. Haflich

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH V08 or V09

Source Language: MACRO-11

Abstract: PCP/MFT will allow any data sets to be used for console input or output for running programs or issuing DOS keyboard commands. True catalogued procedures are available, with the ability to pass arguments and do things conditionally based on the arguments, to detect compiler/assembler/linker errors, and to use crash control files without any changes to DOS. The MFT program permits full timesharing under DOS for two users, each of whom has a fixed area of the machine, and each of whom may use catalogued procedures. Initial dialogue specifies the boundary of the areas, and it may be fully automated by placing replies in a file.

SY:LIMPRT.MFT in the 1,1 area. Timesharing is initiated by running MFT, and a simple exit command may restore normal DOS. System security may be achieved for novice users through assignments which limit system access unless users know the correct passwords to log in under PCP or MFT. Or installations may define whatever procedures they like to speed their work. Error protection is fairly comprehensive, and support for real-time tasks in one partition operating simultaneously with normal DOS operation in the other is provided. There are no differences in the privileges of the two partitions, however, so MFT can support timesharing for any purpose; it is in that sense more general than either RT-11 or RSTS. Note that 16K is a realistic minimum core size for timeshared operation; PCP can run profitably in 12K. Both procedures and normal DOS keyboard-style operation are available, with a few extra console commands. Conditional assemblies support EAE or the 11/45 FPU options if present. Since MFT and PCP only use the EMT vector, all other interrupt vectors are available as under DOS, and DOS programs run without change under MFT, including system programs like EDIT, PIP, and FORTRAN and LINK.

Restrictions: Will NOT run under DOS V4; Requires .RUN EMT

Documentation on Media.

Media Price Code: A2, H32

Format: DOS-11

REDISK—DOS File-Structure Rebuilder**11-196**

Author: G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 12K (8K if modified to verify only RK or RF disks).

Abstract: REDISK is a program to rebuild DOS file-structures on a disk which already has MFD, UFD and Bitmaps on it. It relies on the previous existence of the MFD and Bitmaps for its operation. It will list file-structure problems and optionally fix Bitmaps and zero unused regions of the disk.

Restrictions: Works on any disk, up to 65K blocks—does not work on DECTape

Note: Output of disk information to any data/set

Documentation on Media.

Media Price Code: D2, G10, H32

Format: DOS-11

FFT Demonstration Package*Author:* Rex Tracy and Gene Pope

Colorado State University, Fort Collins, CO

Source Language: PAL-11A and FOCAL/GT*Other Software Required:* FOCAL/GT; FFT 11C*Special Hardware Required:* KE11A Extended Arithmetic Element; GT40 with 8K of core; Programmable clock; Datel Systems #256 D/A—A/D Converter (or other D/A—A/D system)

Abstract: This set of programs provides a means of demonstrating forward and inverse Fast Fourier Transforms. The effects of finite precision arithmetic and overflows in 2's complement arithmetic can also be demonstrated.

Restrictions: Needs to be modified for other than serial interface*Media Price Code:* D4, F5, G22**MEMSEG—A 4K-123K Bank-At-A-Time****PDP-11 Memory Diagnostic***Author:* Philip D. Brooke

Oak Ridge National Laboratory, Oak Ridge, TN

Source Language: MACRO-11*Other Software Required:* SYSMAC.THM macro file (included on tape)*Special Hardware Required:* PDP-11/40, 45; Console TTY and medium from which loaded

Abstract: MEMSEG is a memory diagnostic for the PDP-11/40 and PDP-11/45 computers. The tests utilize the memory management unit (which must be installed) of the computer to check any 4K bank of memory from 4K to 120K corresponding to bank numbers 1 to 36. After loading and starting, the operator types in the number of the bank to be tested. Notification is given of a bank which does not exist, and the entire diagnostic may be run without detailed knowledge of the program. There are currently four tests in MEMSEG.

Restrictions: Tests only 4K-123K (Banks 1-36); Cannot test bank 0 (0-3K). Requires memory management*Note:* DECTape includes 11-199*Media Price Code:* A1, B3, H32, K27*Format:* DECTape-DOS-11, Floppy-RT-11**SYSMAC.THM***Author:* Philip D. Brooke

Oak Ridge National Laboratory, Oak Ridge, TN

Source Language: MACRO-11

Abstract: SYSMAC.THM is a group of assembler-language macros which have been found to be useful in various ways. Some of these macros are simple utility functions, while others, in particular the CALL macro, contribute greatly to the tidiness, understandability, and overall consistency of the programs in which they are used.

Media Price Code: (Order DECUS No. 11-198)**DIBOL Translator***Author:* Gene Naddeo

Digital Equipment Corporation, Maynard, MA

Operating System: RT-11*Source Language:* DIBOL-11*Memory Required:* 16K*Special Hardware Required:* COS 350 System with 132 column printer and running with a single user monitor

Abstract: The DIBOL TRANSLATOR is a programming tool designed specifically to translate DIBOL-8 programs to DIBOL-11 pro-

11-197

grams. The translator functions as an intermediate step; a means of locating and altering the areas within a DIBOL-8 users program which are not compatible with the requirements of the DIBOL-11 compiler.

Error-free DIBOL-8 programs are translated into programs that, with minor modifications, are capable of running under COS 350. The DIBOL TRANSLATOR cannot, however, perform as an automatic converter, nor can it correct program errors. Rather, the translator serves as a means of discovering the inconsistencies between the two languages, eliminating them (where possible), and notifying the user that certain areas may require further work on his part.

Media Price Code: A3, H32, K27, M55, Q145*Format:* RT-11**PAL-8, 11—A PDP-8 Assembler Implemented on a PDP-11****11-201***Author:* Bruce Rodolphe Bergeron

University of Massachusetts, Amherst, MA

Source Language: PAL-11*Special Hardware Required:* High speed reader

Abstract: PAL-8, 11 is a two-pass assembler with optional third pass, for assembling PDP-8 code on the PDP-11. All features of PAL-III, the assembly language of the PDP-8, are included with several additions. Source input is via the high speed reader. Output is via the ASR33, high speed punch, or line printer.

Media Price Code: A1, F6, G18**EDITX—An Improved DOS EDIT****11-202***Author:* D. Nelson*Submitted by:* G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH*Source Language:* MACRO-11

Abstract: EDITX is a version of EDIT-11 which has a substitute command allowing one to replace a string without counting characters. It looks like

z/hello/goodbye/

and will in that case find "hello" and replace it with "goodbye". It has the ability to accept lower-case commands, and has a few other utility commands in addition to all EDIT-11 commands. (It is about the same as V7 of EDIT otherwise.)

*Documentation on Media.**Media Price Code:* H32*Format:* DOS-11**FORM—A Formatter for MACRO Source Code****11-203***Author:* G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH*Source Language:* MACRO-11

Abstract: FORM is a program which takes MACRO source code and puts tabs at the start of each line and between opcode and arguments. It uses a PIP-like command string—2 files. It will make MACRO code punched on cards look good and even.

Media Price Code: H32*Format:* DOS-11

MFT Utility Package*Author:* G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Source Language: MACRO-11*Other Software Required:* MFT-11 (DECUS No. 11-195)

Abstract: A system status report program is provided which, running under MFT-11, will report who is using the system and what their terminals are, and how much core is allocated to the user. This is for people timesharing with two widely separated terminals.

A pair of programs and examples of matching catalogued procedures for inter-partition communications of commands is provided. These enable one partition to submit jobs to the other to be done while the submitting partition does its own jobs. (This is designed for single-terminal systems.)

Restrictions: Will not work under DOS. Intertask message sender is restricted to sending from low to high partition

Media Price Code: A1, G10**Core-Only RSX-11M, Version 1***Author:* John Sutherland

11-205

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M BL08 V1*Source Language:* MACRO-11*Memory Required:* 24K*Special Hardware Required:* 2 RK05s, LA36, TA11

Abstract: This set of 22 files allows a present user of RSX-11M BL08 to generate a core-only executive. Transfer media is three TA11 cassettes. The cassette files are used to replace standard RSX-11M SYSGEN files on the host disk-based system on which the sysgen must be done. The sysgen is done in a manual mode (rather than via the indirect files) according to cook-book operator procedures supplied and requires a minimum 24K system.

CAUTION!! The user should know PDP-11s and RSX-11M well before he tries this technique. Even with the cook-book-instructions there are subtle aspects of this system that require in-depth user knowledge.

Restrictions: Persons requesting these files must enclose proof of an RSX-11M license, or be DEC personnel.

Media Price Code: A2, L33**DSKPAT**

11-206

Author: J. E. Pollack and G. C. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH*Source Language:* MACRO-11

Abstract: DSKPAT is a revision of DPEEK with one simple addition. It is a simple disk patcher for use under DOS-11 allowing inspection and patching in octal, RAD50, or ASCII and able to be used in a batch environment. It follows the same conventions as DPEEK, but will type out one word's contents if the word number followed by a colon is typed. All other DPEEK commands are preserved.

Restrictions: Must assign any disk to be patched to logical name "DSK" unless device is SY0:

Media Price Code: A1, H32*Format:* DOS-11**MRMLIB**

11-207

Author: Dr. M. R. Manning

Institute of Nuclear Sciences, Lower Hutt, New Zealand

Operating System: RT-11*Source Language:* FORTRAN IV

Abstract: MRMLIB is a personal collection of subprograms which can be called by FORTRAN programs and which can also be written in FORTRAN. The principal aim in setting up this library has been to establish a reasonably portable set of subprograms which carry out operations that would otherwise be continually rewritten. Thus, many of the routines in this library perform simple (even trivial) tasks. Two strong secondary aims are to establish a standard set of interfaces which are inherently more portable than the routines, and to establish proven subprograms for non-trivial operations particularly in the numerical area.

No guarantee as to the correctness or efficiency of any routine can be given but generally the routines will have been used to a degree that should allow some confidence in them.

Media Price Code: A2, H32*Format:* DOS-11**BIOMAC—Macros for Structured Programming in MACRO**

11-208

Author: Scott Herman-Giddens

Duke University, Durham, NC

Operating System: DOS/BATCH V8.02 or later*Source Language:* MACRO-11*Memory Required:* 16K

Abstract: BIOMAC is a set of PDP-11 macro skeletons which may confer a block structure on MACRO programs, enabling structured programming. They include provisions for selective (IF ... ELSE ... END, for example) or repetitive (WHILE, REPEAT, etc.) block execution, execution of blocks as subroutines, and verification and debugging.

Media Price Code: A2, B5, H32, K27*Format:* DECTape-DOS-11, Floppy-RT-11**RX11 Floppy Utility**

11-209

Author: Kay Fisher

Digital Equipment Corporation, Maynard, MA

Source Language: PALX11*Memory Required:* 8K*Special Hardware Required:* RX11 floppy disk system

Abstract: This program will copy or scan RX01 floppy disks assigned to Unibus address 177170 to 177172 only.

Media Price Code: D2, F5, G14**Everhart Collection on Magtape**

11-210

Author: Glenn C. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Special Hardware Required: DOS-11 Operating System

Abstract: This package contains a collection of programs submitted to DECUS in the past on DECTape or paper tape. The author has resubmitted them on a 9-track, 2400 ft. magtape for the convenience of those who do not have DECTape. Some programs are given as source code here, which were given as object code previously, and some programs are new versions not available on other media. It is suggested that individual write-ups be ordered for the specific programs desired.

Among the programs in the package are: 11-70; 11-106; 11-156; 11-171; 11-172; 11-195; 11-196; 11-202; 11-203; 11-206.

Media Price Code: A2, P85*Format:* DOS-11

PLOT—Digital Incremental Plotter Software Package

Author: Jeffrey Kodosky
Applied Research Labs., University of Texas, Austin, TX
Source Language: MACRO-11
Memory used: 760 words minimum, 2900 words maximum
Other Software Required: FPMP or FORTRAN Library Routines
Special Hardware Required: DIGITAL Incremental Plotter

11-211

Abstract: This plot package consists of five MACRO-11 source modules containing FORTRAN callable routines which implement plotting operations on a Digital Incremental Plotter. A FORTRAN source tape for a demonstration program is also included. The subroutines in the foundation module handle interrupt driven vector plotting, origin resetting, vector scaling, dotted line plotting, and Y-motion limiting to prevent loss of origin. In addition, a subroutine is provided which will implement a circular buffer to buffer the plot vectors. The other modules contain utility subroutines which call the subroutines in the first module. A small lettering routine containing 64 characters is provided for use where core space is restricted. A more sophisticated symbol plotting subroutine exists which has a 157 character repertoire and is expandable to many times that number. It presently contains upper and lower case Roman and Greek alphabets and standard math symbols. An axis plotting subroutine is included which will plot a linear or logarithmic coordinate axis at an arbitrary angle.

Media Price Code: A2, B8, G68

LIB.FOR—Library Routines

Author: David Sykes
Mead Technology Laboratories, Dayton, OH
Operating System: RT-11 V2B
Source Language: FORTRAN
Other Software Required: SYSLIB

11-213

Abstract: LIB.FOR is a concatenated series of FORTRAN source modules for a variety of useful utility routines. They are intended to be built into the user library, although they can be separated out into separate subroutines. SORTR, SORTI, SORTB, and SORTW are a series of similar routines which provide very rapid sorts of arrays of real numbers, integers, byte ASCII characters, and word ASCII characters (A1), respectively. They all use the monkey puzzle tree sort technique. SHELL and SHELLR are a pair of relatively fast in-place sort routines for integers and real numbers, respectively. All sort routines can also be used under DOS. CAD is a subroutine which implements the CAD function of the VT05 terminal, allowing the program to place the cursor anywhere on the screen. JDATE, KDATE, and LDATE provide manipulation for a Julian date in the same format that DOS uses; this is more useful for many purposes than the standard RT-11 system date word.

Media Price Code: A1, G10, K27

Format: RT-11

RENUM—FORTRAN Renumbering Program

Author: David Sykes
Mead Technology Laboratories, Dayton, OH
Operating System: RT-11 V2B
Source Language: FORTRAN

11-214

Abstract: RENUM is intended to provide two useful services for the FORTRAN programmer: (1) Replace the existing statement numbers (labels) with a new (and equivalent) series of sequential numbers, and (2) produce a cross-reference table of all the variable names used in the source file showing all line numbers where each occurs. Either or both of these services along with a listing of the source code can be produced. The two functions are completely independent. Control is by means of terminal-entered command strings following the standard RT-11 rules. Input files (up to 6 per command line) can be on any disk device and output files can be directed to any device. When renumbering, a new disk

file is created with the renumbered source code and the original source file is changed to .OLD. The line numbers used for cross-referencing the variable names agree with those on a compiler-generated listing. RENUM runs only under RT-11 version 2B and requires SYSLIB.

Media Price Code: A1, G48, K27

Format: RT-11

TRACE.MAC/TR.MAC

Author: Michael N. LeVine
Naval Weapons Center, China Lake, CA
Operating System: RT-11 V2
Source Language: MACRO-11

11-215

Abstract: TRACE/TR are meant as debugging tools for writing assembly language programs. When implemented and directed to do so, either program will, upon completion of execution of an instruction in a section of code being traced, print out the location in memory of that instruction, its mnemonic and arguments as well as the contents of all registers and memory locations referred to. They then return to the traced program for the next instruction. The resulting output is a listing of exactly what instructions were executed and what happened because of it.

TRACE.MAC is a subroutine that must be linked in with the program to be traced and be initialized by it.

TR.MAC is a pseudo device driver that is assembled and linked to TR.SYS, entered into the monitor device driver tables. The user does not have to link it into the main program each time.

Both versions can be modified to direct their output to the LP: rather than the console device.

Media Price Code: A1, H32, K27

Format: RT-11

FORMAT—DECtape Formatter for RT-11

Author: David Ofsevit
U.S. Department of Transportation, Cambridge, MA
Operating System: RT-11
Source Language: MACRO-11
Special Hardware Required: DECtape control and transports

11-216

Abstract: This program is the standard PDP-11 DECTape formatter TOG-11, modified to run under RT-11. It makes formatted DECTapes on unit 7 with a standard format of 578₁₀ blocks of 256₁₀ words each.

Media Price Code: D2, H32

Format: RT-11

LP.MAC—A Handler for Use With an A.B. Dick

Videojet Line Printer Under RSX-11D
Author: T. J. Kuriakose and W. F. Edgell
Purdue University, West Lafayette, IN
Operating System: RSX-11D
Source Language: MACRO-11
Memory used: 414 words
Special Hardware Required: PDP-11/45

11-217

Abstract: This LP handler for the A.B. Dick Videojet Line Printer for the RSX-11D system runs under interrupt and is useful for all general purposes. It can easily be incorporated into the system by installing after assembling and task building. The interface is available from A.B. Dick.

Media Price Code: D2, H32

Format: FILES-11

A Device Handler and Plotting Package for Houston Instrument DP1-Plotter Under RSX-11D

Author: T. J. Kuriakose and W. F. Edgell
Purdue University, West Lafayette, IN

Operating System: RSX-11D

Source Language: MACRO-11

Memory Required: 1595 words

Other Software Required: FORTRAN Modules: \$POLSH, \$MLR, \$RI + FCO, \$ECO, \$GCO

Special Hardware Required: PDP-11/45; Houston Complot (DP1) Plotter

Abstract: These are routines for basic scientific plotting with a Houston Complot (DP1) plotter and the PDP-11/45 under the RSX-11D system. They consist of a device handler and a plotting package. The routines are callable either from FORTRAN or assembly language programs. Although the programs are written for a specific interface they are readily adaptable to any other. The documentation describes the basic action of each of the ten modules.

Media Price Code: A2, B3, H32

Format: FILES-11

PTHEAD—Paper Tape Heading Program

11-219

Author: John Steiert

University College of Wales, Aberystwyth, Dyfed, Wales

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 4K

Special Hardware Required: Teletype, Papertape punch

Abstract: This program punches legible headings on paper tape in response to characters typed at the teletype. The full ASCII (1968) character set is defined.

No Source Available.

Media Price Code: A1, F5

PICT—Machine Code Tester

11-220

Author: John Steiert

University College of Wales, Aberystwyth, Dyfed, Wales

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 12K

Special Hardware Required: TTY

Abstract: This program allows octal machine code instructions to be typed in at the keyboard. The user can then execute his program at a selected address. Illegal and reserved instructions are trapped. At the end of the text the stack is checked.

It is particularly useful for testing small sections of position independent code.

No Source Available.

Media Price Code: A1, F5

ODT-11T

11-221

Revised: 12 October 1977

Author: Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11

Source Language: MACRO-11

Abstract: ODT-11T is an extension of RT-11 ODT (DEC-11-ORODA-D) adding three (3) commands:

11-218

- N;T Trace any section of code in which the user is interested, giving the instruction mnemonic, registers and accumulators referenced.
- R;M Monitor the contents of memory location R after each instruction is executed and do a breakpoint if has been changed.
- N;V Simulate an interrupt to the vector N, for check out of interrupt service routines.

Media Price Code: A1, H32, K27, M55

Format: RT-11

DOSLST—DOS Directory/File Lister

11-223

Author: G. Everhart and T. Lagerlund

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 2 1/2 K

Abstract: DOSLST is a program to list DOS files and directories from DOS-Format disks. It differs from PIP in that its directories are in a two-column format and contain information about the file locations on disk, and in that it supports the use of ? as a wild-card character in addition to the use of * in specifying wild-card files. It can list files on any DOS disk, outputting to any DOS dataset. But, defaulting to LP: it will not correctly transfer binary files. However, it writes entirely in formatted ASCII mode.

Restrictions: Lists only on disks—not on magtape or DECtape

Media Price Code: D2, G14, H32

Format: DOS-11

MPS Cross Assembly Programs for RT-11

11-224

Author: Robert Tedford

Digital Equipment Corporation, Marlboro, MA

Operating System: RT-11

Source Language: FORTRAN and MACRO-11

Memory Required: 16K

Other Software Required: RT-11 FORTRAN

Special Hardware Required: DECtape or Disk pack

Abstract: This is a set of programs written in FORTRAN and MACRO which allows the user to assemble and execute programs written for the 8008 Microprocessor. The package includes an assembler, cross-reference program, simulator and binary punch program.

Restrictions: Maximum size program that is supported by the simulator is 8K

Media Price Code: A2, G34

GT40 Graphics Utility Routines

11-225

Author: Rex Tracy

Colorado State University, Fort Collins, CO

Operating System: BASIC V007A

Source Language: PAL-11 and BASIC

Other Software Required: 8K GT40 and 8K 11/20

Special Hardware Required: PDP-11/GT40 or PDP-11/20, DL11E and an incremental plotter interfaced to the GT40

Abstract: This set of programs provides the GT40 user a method of obtaining a hard copy of the information (plots) currently on the screen. A subroutine interprets the GT40 display code and produces commands to an incremental plotter interfaced to the GT40. A driver routine is

11-225 (Cont.)

provided to use the GT40 as an X-Y plotter. An external function for use with BASIC in another PDP-11 will provide graphical output from BASIC programs. Test programs are provided for all routines.

Restrictions: Display stop instruction not interpreted, character mode not available on plotter, line types not implemented for plotter

Media Price Code: A2, B5, F5, G60

RO.MAC MT ROLLIN File Device Driver

11-226

Revised: October 1977

Author: Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11 V3

Source Language: MACRO-11

Abstract: RO.MAC is a magtape device driver that allows the user to access one disk rollout on a magtape containing any number of rollouts and treat the file as if it were a file structured device. The specified rollout file is then the pseudo disk RO:; available to the user for any operation that does not involve writing on the magtape (RO:), available to the user for any operation that does not involve writing on the magtape.

Media Price Code: D2, H32

Format: RT-11

**TAGFIL.FTN—Directory Annotation Program
for DOS and RT-11**

11-227

Author: Robert Wells and Robert Feinstein

Marine Biomedical Institute, University of Texas Medical Branch, Galveston, TX

Operating System: DOS/BATCH 9-20c and RT-11

Source Language: FORTRAN IV

Special Hardware Required: RK05

Abstract: This program is used for maintaining file documentation in the form of annotated and updatable disk file directories. It requests from the user the names of three files:

(1) Old tagged directory—This is a directory previously created by this program which one wishes to update (or if creating a new tagged file, this can be most anything). Previously assigned tags are transferred from here to the new tagged directory.

(2) PIP Directory—This is a disk directory produced by PIP. This directory is used to update the old tagged directory by reflecting added or deleted files and newer versions of old ones.

(3) New Tagged Directory—This is the updated tagged directory produced by TAGFIL.

For every file in the PIP directory, the old tagged directory is searched. If a tag exists for the file, it is copied into the new tagged directory. If not, a tag for the file is requested from the terminal.

Modifications to old tags and similar operations can best be performed using EDIT.

Media Price Code: D2, G8

Contour Plotting Program

11-228

Author: Rajesh Motwani

Marine Biomedical Institute, Galveston, TX

Operating System: DOS/BATCH

Source Language: FORTRAN IV

Memory Required: 32K or more

Other Software Required: Gould Plot Library Routines

Special Hardware Required: PDP-11/45, disk, high speed reader/punch, Gould 5000 Printer/Plotter

Abstract: This program plots contours in two dimensions X, Y for several values of the third independent variable Z. The data for which

contours are to be plotted is assumed to be a discrete tabulation of a single value function.

$$Z = F(X, Y)$$

The program works on a Gould 5000 Printer/Plotter, but could be easily modified to work on any plotter.

Media Price Code: D2, G14

INDEX: FORTRAN Cross Reference Program

11-229

V02J

Revised: October 1977

Author: Michael N. LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11 V3

Source Language: MACRO-11

Abstract: INDEX is a cross referencing program that does for FORTRAN what CREF does for MACRO. A source program run through INDEX will be checked for all of its variable name and label usage. The results will then be listed in alphabetical order, listing all the variable names and labels used in the program, the lines on which they were used, and how they were used; if needed, the variables from specified programs can be saved along with those of other programs and later printed out as a super index giving variable name and the names of all the programs it was used in. Also included is the capability to exclude from the index listing all variables that only appear once in a program in a common block.

INDEX will handle all programs written in FORTRAN IV, FORTRAN IV PLUS in accordance with PDP-11 FORTRAN Language Reference Manual (DEC-11-LFLRA-C-D).

Documentation on Media.

Media Price Code: A2, H32, K27, M55

Format: RT-11

RMDEMO

11-230

Author: Eric Baatz and Kim Kinnear

Technological Institute, Northwestern University, Evanston, IL

Operating System: RSX-11M V02 or RSX-11S V01

Source Language: MACRO-11

Memory Required: Dependent on assembly options

Special Hardware Required: Any PDP-11 configuration supporting RSX-11M V02 or RSX-11S V01

Abstract: RMDEMO is an RSX-11M, V02 task that displays pertinent information about its system.

Restrictions: Must have RSX-11M license and the RSX-11M "MAPPED OBJECTS" distribution kit

Documentation on Media.

Media Price Code: H32, L33

Format: FILES-11

ALGOL for RT-11

11-231A

Author: Gregory D. Hosler

Digital Equipment Corporation, Maynard, MA

Operating System: RT-11

Source Language: MACRO-11 and ALGOL

Memory Required: 16K

Abstract: ALGOL compiler and run-time system for ALGOL-60 language operates on 16K or larger RT-11, or RSX-11M, RSX-11D Systems.

11-231A (Cont.)

This implementation of the ALGOL-60 language features dynamic allocation of program and data segments through a software virtual memory system. All ALGOL-60 statement components are supported, plus several extensions, such as the THRU statement, numbered and unnumbered CASE statements, and the string REPLACE and SCAN statements. Data types supported are 16-bit INTEGER, 16-bit BOOLEAN and one or two dimensional arrays (of INTEGER or BOOLEAN elements) with variable upper and lower bounds. Procedures may be typed INTEGER or BOOLEAN, or may be untyped. A Burroughs-compatible implementation of string operations using pointer variables is provided.

Other features include partial word operations, bit concatenation, IF and CASE expressions of all types, record-oriented random-access and stream sequential I/O. The I/O operations read and write standard RT-11 files.

The virtual memory support, RT-11 input/output, and all other operations are handled through an interpreter which executes the code files output by the ALGOL compiler.

Restrictions: Does not support floating point arithmetic.

Media Price Code: A10, H64, K81, M55

Format: RT-11

ALGOL for RSX-11

Author: Gregory D. Hosler

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M and RSX-11D

Source Language: MACRO-11 and ALGOL

Memory Required: 16K

Abstract: Same as DECUS No. 11-231A.

Media Price Code: A10, M55

Format: DOS-11

11-231B**FORTH Programming System for the PDP-11****11-232**

Author: H. Wayne Hammond and Martin S. Ewing

Owens Valley Radio Observatory, California Institute of Technology, Pasadena, CA

Operating System: RT-11 or stand-alone

Source Language: MACRO-11

Memory Required: 8K or more

Special Hardware Required: Disk, DECTape, or industry compatible magnetic tape

Abstract: FORTH is a self-contained programming system that has become popular in scientific applications requiring interactive control and data acquisition. The system supports a high-level structured language using reverse Polish notation; it contains an incremental compiler, an assembler, and a text editor. FORTH maintains a direct-access file on disk, DECTape, or pre-formatted industry magnetic tape. The programs submitted allow FORTH to be generated on an RT-11 system to run under RT-11 or to run stand-alone using disk or magnetic tape. The user may select versions that use the EIS or EAE options. A DECsystem-10 version (DECUS 10-241) is available.

Media Price Code: E12, H32, K27, M55

Format: RT-11

A Modified IOX for Handling More Than One Terminal**11-233**

Author: Rudy Krall, Jr. and V. E. Sater

Honeywell, Inc., Phoenix, AZ and Arizona State University, Tempe, AZ

Source Language: PAL-11A

Memory Required: 8K

Abstract: This program is an extension of the PDP-11 IOX package originally supplied by DEC. The extension adds the capability of using a second terminal (either TTY or CRT) with all of the programming functions available for it as for the first terminal, including a separate RESTART address.

Media Price Code: D3, F5, G22

MUD11**11-234**

Revised: 4 June 1976

Author: M. L. Zimmerman

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH, V8, V9 or V10

Source Language: MACRO-11

Memory Required: 16K or more to be useful

Special Hardware Required: Two terminal devices, real-time clock

Abstract: This program allows users (currently only two) at different terminals to time-share a PDP-11 in a DOS-11 environment. Memory can be partitioned as desired and various PDP-11 options specified at MUD11 assembly. MUD11 allows terminal type ahead at all times and the MUD11 commands include the commonly used DOS-11 commands.

Revision a: The original MUD11 was written in a piecemeal fashion, the new version is more integrated and has less code. The EMT processor was almost completely rewritten, making it faster and much less susceptible to crashes. Several new features have been added, notably the message command and the handling of A002 and A003 errors. Overall the system is now faster and much more reliable.

Restrictions: Has been tested only on PDP-11/20 and PDP-11/45

Documentation on Media.

Media Price Code: A2, H32

Format: DOS-11

CYCLES**11-235**

Author: Vincent Perriello

CAM Systems, Incorporated, Waterbury, CT

Operating System: RT-11 V02

Memory Required: 16K

Memory used: 3K MU BASIC Portion and 8 blocks on device "DK:" for virtual file storage.

Abstract: This program is an adaptation of RSTS11-76 by Susan Lewis. It has been rewritten for RT-11 and MU BASIC.

CYCLES formats a biorhythm chart for printing on either a user terminal or a line printer. Output may be directed to any legal RT-11 device. The output requires a wide carriage printer or terminal (such as LA36).

The biorhythms are calculated by methods which assume birth and current dates to be between January 1, 1901 and December 31, 1999.

For brevity the program always prints a 31 day chart, regardless of the actual length of the month.

Media Price Code: D1, G5, K27

Format: RT-11

SOTS - Small FORTRAN OTS for RSX**11-236**

Author: W. H. Brown

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M/RSX-11S

Source Language: MACRO-11

Abstract: This is a series of modules which when linked with a FORTRAN program, result in a significant reduction in program size.

11-236 (Cont.)

This is particularly intended for RSX-11S but can be used for other real-time tasks where size is critical and disk I/O is not required. I/O is limited to formatted I/O to UNIT RECORD DEVICES and QIO calls.

Using SOTS: There is an RSX-11M command file to build and run a sample task, just copy the files to your disk, and type:

@TESTS.BLD

Documentation on Media.

Media Price Code: H32, M55

Format: DOS-11

Extended FOCAL, DOS Version

11-237

Author: G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: about 2 1/2 K (load module for 16K supplied)

Abstract: DOS extended FOCAL is a version of FOCAL-11 that runs under DOS and has extensions for device control. A full set of library functions, extended mathematical functions, boolean functions, interrupt handling ability, and the ability to do octal I/O make this version of FOCAL useful for instrument tests as well as calculations. The full range of DOS CTRL-C commands is supported, and documentation is furnished to simplify addition of user functions.

Restrictions: Library Delete not yet implemented. Must link with/T switch to reserve program room.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

SGCML: Get Command Line Enhancement

11-239

Author: J. E. Pollack

University of Washington, Seattle, WA

Operating System: RSX-11 and IAS V01

Source Language: MACRO-11

Abstract: SGCML is an enhancement of the RSX-11D GCML subroutine. Added functions include the ability to include commands in an indirect file, to prompt the operator for yes/no responses and conditionally select commands for return to the calling program. This is similar but enhances from the RSX-11M task '... AT.' or indirect MCR. This function provides the capability for very complex startup files, applications program indirect command structures, etc. This routine is used by the following DECUS programs: 11-240 (STARTUP), and 11-238 (DIS-ASM).

Note: Suited for RSX-11D, M, or IAS

Documentation on Media.

Media Price Code: H32

Format: DOS-11

START: RSX-11D Startup Command Stuffer

11-240

Author: J. E. Pollack

University of Washington, Seattle, WA

Operating System: RSX-11D and IAS V01

Source Language: MACRO-11

Abstract: STARTUP is a program to aid in post-boot setup in RSX-11D or IAS systems. When set to run just after boot, STARTUP will mount the system disk and then open an indirect file of MCR and 'DOT' commands and process that file in a fashion related to the RSX-11M indirect MCR operation. The conditional command nature of SGCML permits operator selection of startup operations and configurations without the necessity of extensive typein at each boot operation.

The user is encouraged to obtain DECUS 11-239 (SGCML - command input routines) and DECUS 11-241 (RUNOFF - document preparation) as they are associated with this program.

Restrictions: Designed for RSX-11D, IAS. Not suitable for RSX-11M.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

RUNOFF: Documentation Preparation

11-241

Revised: 1 September 1977

Author: Larry Wade and J. E. Pollack

Digital Equipment Corporation, Maynard, MA and University of Washington, Seattle, WA

Submitted by: Mark Lewis

Federal Aviation Administration, Oklahoma City, OK

Operating System: RSX-11D V6.2, RSX-11M V3.0, IAS V2.0

Source Language: MACRO-11

Abstract: RUNOFF is a PDP-11 version of the DECsystem-10, RSTS/E, and PDP-8 programs of the same name. Document preparation is greatly aided by RUNOFF. DEC internal documentation is prepared entirely in RUNOFF before publication. Right margin justification, hyphenation, pagination, index creation, upper/lower case operation are among the facilities provided. This version is suitable for RSX-11D and RSX-11M and with moderate effort in the operating system interface, RT-11.

Documentation on Media.

Media Price Code: A3, H32, K27

Format: FILES-11

FILDMP: File Dump Utility and Object Module

11-242

Cracker

Author: J. E. Pollack

University of Washington, Seattle, WA

Operating System: RSX-11D and IAS V01

Source Language: FORTRAN IV—Plus

Abstract: FILDMP is a FORTRAN program written to function in a similar fashion to the DOS/BATCH-11 FILDMP program. In addition, a dump mode is included to read object module files and crack the internal code and present the various object record types. (Note that no disassembly of object code is attempted). Minor conversion will be necessary from F4P form to F4 or FTN.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

LISTER: Listing Utility Program

11-243

Author: Jeffrey Kodosky

University of Texas at Austin, Austin, TX

Operating System: RT-11 V02B

Source Language: MACRO-11

Memory Required: 1K

Abstract: LISTER is a utility program designed to format ASCII files for proper paging when listing on a device which doesn't support hardware form feeds. Page size as well as the number of printed lines per page are two of the items which may be specified.

Media Price Code: D2, F5, G8

RENUMB.BAS: BASIC File Renumbering Program

Author: Nick Hammond
 Friern Hospital, London, England
Operating System: RT-11
Source Language: BASIC (Single User)
Memory Required: 8K

Abstract: RENUMB will re-number the lines of any RT-11 Single User BASIC program. Various error conditions are detected and flagged. The program can therefore be used for diagnosing simple program errors.

Media Price Code: D2, G8, K27
Format: RT-11

T4010C TEKTRONIX 4010/4610/4953 Control Procedures

Author: Dr. Urs R. Wyss
 BRI, University of Zurich, P.O. Box 108 CH-8029 Zurich, Switzerland
Operating System: DOS/BATCH V9.20C
Source Language: MACRO-11 Assembly Language
Memory used: 561(10) 16-bit words
Special Hardware Required: PDP-11/20, TEKTRONIX 4010 Terminal TEKTRONIX 4610 and 4953 optional

Abstract: T4010C is a module of 14 subroutines for DOS/BATCH-11 compatible control of the TEKTRONIX peripherals 4010, 4610, and 4953, intended for use in a FORTRAN IV environment, and written in MACRO-11 assembler code. Besides 7 subroutines for special functions, 7 graphic routines may be used for point and vector plot, frames and graticules, text strings, thumbwheel cursor graphic input, and graphics tablet coordinate input. The .READ and .TRAN data transmission facilities of the DOS/BATCH monitor are used for all I/O operations.

Media Price Code: A2, B3, H32
Format: DOS-11

PASCAL: PASCAL-11 Programming System

Author: Lucien Feiereisen
 Universitaet Karlsruhe, West Germany
Operating System: DOS/BATCH V09
Memory Required: 48K or 64K

Abstract: PASCAL, a multipurpose language based on ALGOL, is designed for use as a tool for structured programming. The simple and concise language provides a rich set of data types and structuring methods allowing the programmer to define and use his own data types.

All features of the used PASCAL language (class & alfa variables, value & file declarations, global exits, ...) are implemented except for parametric procedures. The floating point processor is used for real arithmetic and for text & set handling. The I/C concept includes concurrency and explicit output control.

Note: Complete sources are not available

Media Price Code: A2, H32, K54
Format: DECtape-DOS-11, Floppy-RT-11

DXDRV: RX01/RX11 Handler for RSX-11D or IAS

Author: Greg Bassett
 Digital Equipment Corporation, Maynard, MA
Operating System: RSX-11D V6A or 6B and IAS
Memory Required: Approx 756 words
Special Hardware Required: Minimum RSX-11D or IAS configuration, with RX01/RX11

11-244

Abstract: This is a floppy disk handler for RSX-11D V6A or V6B and IAS V1A. With this handler there is full Files-11 support, including the following functions: BAD, INIT VOL, MOU, DMO, and all other standard file functions. No modifications need be made to executive or any utility to support this device. It will look like any other disk on the system. It produces disks fully compatible with RSX-11M. FILEX does support the RT-11 Floppy disk file structure.

Restrictions: MACRO-11

Media Price Code: A2, H32, M55
Format: DOS-11

TABS: Replaces Tabs with Blanks

Author: J. Mills
 University of Western Australia, Nedlands, Western Australia
Operating System: RT-11 V02
Source Language: MACRO-11
Memory Required: 1.7K
Special Hardware Required: PDP-11 with RT-11 support

Abstract: TABS will replace horizontal tab characters in ASCII files with the correct number of blanks for the normal 8 character tab spacing, thus making files with tab characters properly readable by FORTRAN and other programs requiring a strict format.

Media Price Code: D2, G5

WHO. OBJ

Author: Bruce Boswell
Submitted by: Gerard Zarka
 Digital Equipment Corporation
 Int'l. Europe, 81 Route del'Aire, 1211 Geneva 26, Switzerland
Operating System: RSX-11D/IAS

Abstract: The program WHO has been modified with the intention of giving more information to the users via the terminals. Concerning the "Active Task" the names of three tasks are given. If more than three tasks are used with the same terminal an * will appear after the 3rd name. The programs can also be used under IAS.

Media Price Code: A1, H32

Format: RT-11

SET. OBJ

Author: J. Masse
Submitted by: Gerard Zarka
 Digital Equipment Corporation Int'l. Europe, 81, Route L'Aire, 1211 Geneva 26, Switzerland
Operating System: RSX-11D/IAS

Abstract: SET has been modified to enable terminal characteristics to be changed for DH11 lines.

Two new keywords have been added: 1) SET/SPEED=TT(n): TRANSM: This instruction allows user to change the receiver and transmission speed of the terminals connected to a *DH line*. This instruction must be used when the terminal involved is inactive. 2) SET/LA36=TT(n): The modification allows the use of the 132 positions of a LA-36.

Media Price Code: H32

Format: DOS-11

11-248

STAGE2 For Small Paper Tape Systems*Author:* W. M. Waite*Submitted by:* M. A. MacLeanDepartment of Computer Science, University of Canterbury,
Christchurch, New Zealand*Source Language:* PAL-11A*Memory Required:* 8K or more*Special Hardware Required:* High-speed paper tape reader/punch
or Teletype

11-251

Abstract: STAGE2 is a language-independent macro processor described in W. M. Waite's book 'Implementing Software for Non-Numeric Applications' (Prentice Hall 1973). This version can be used with small PDP-11's having papertape software. The only feature of the original program not implemented is I/O channel 2 (the scratch file).

Media Price Code: D2, G18**LASL Cornucopia #1***Author:* Richard Kittell and other LASL programmers
Los Alamos Scientific Laboratory, Los Alamos, NM*Operating System:* RSX-11D, V6A*Source Language:* MACRO-11 and F4P*Other Software Required:* Same programs require F4P

11-252

Abstract: A collection of 37 useful routines including macros, file builders, integer conversion, searches, MCR tasks, partition mapping and much, much more. Complete documentation is included in the sources. Abstracts of all routines and a directory of files constitute the hard copy write-up offered.

Media Price Code: H32, M55*Format:* FILES-11**VOLUME***Author:* Terry Montlick

Haskins Laboratories, New Haven, CT

Operating System: RSX-11D V6A or later*Source Language:* MACRO-11*Memory Required:* 1K*Other Software Required:* RSX-11D Message Output Handler
(MO)

11-253

Abstract: The VOLUME MCR command allows a privileged RSX-11D user to change the characteristics of a previously initialized FILES-11 volume. VOLUME supports all the keywords that INITVOL does, except for the index file initialization keywords INF and INDX, and the bad blocks keyword BAD. VOLUME uses the same command syntax as INITVOL.

*Documentation on Media.**Media Price Code:* H32*Format:* FILES-11**MATRIX ROUTINES***Author:* Samuel Day

SUNY-Cortland, Cortland, NY

Source Language: BASIC-11*Memory Required:* 16K

11-254

Abstract: Programs written in BASIC for the PDP-11. MATADD, MATSUB, MATMUL and MATIN perform the fundamental operations of matrix manipulation, and would probably be most useful as subroutines in larger programs. MATSOL uses a matrix inversion subroutine to solve sets of simultaneous linear equations. MATPAK is a series of

chained programs which combine all of the above and some other features into a comprehensive package for matrix manipulation, and should be useful to anyone who deals with matrix algebra, but does not have MAT functions available.

Media Price Code: A3, B2, H32, K27*Format:* Floppy-RT-11**TELEP.BAS: Address Manipulator**

11-255

Author: Klaus E. Liebold

Salk Institute, San Diego, CA

Operating System: RT-11 V2C*Source Language:* BASIC

Abstract: A useful, enjoyable program which will order, save, edit, delete, search and print names, addresses, telephone numbers and birthdays. It lets your computer replace your "little black book".

Media Price Code: D1, G5**EAS.BAS: Enhanced Assembler Structures**

11-256

Author: R. Barry Price

University of Texas Medical Branch, Galveston, TX

Operating System: DOS/BATCH*Source Language:* MACRO-11*Memory Required:* approx. 14,000 characters*Special Hardware Required:* System supporting MACRO-11 Assembler

Abstract: A package of macros which provide control structures similar to those used in structured programming at the assembler level.

Media Price Code: D4, G16**ABSPAT: Absolute Binary Patch on RK Disk and DECtape**

11-257

Author: F. Kuster

Hybridrechenzentrum der ETH, Zurich, Switzerland

Operating System: DOS/BATCH (stand alone)*Source Language:* MACRO-11*Memory Required:* 7K/9K depending on version*Special Hardware Required:* RK Disk or DECtape, papertape punch, line-printer.

Abstract: ABSPAT is a stand-alone utility program that is used to read, display and patch the contents of any block on the RK-Disk and DECtape. The data may be printed and entered in the following formats: ASCII, RAD50, octal/decimal, word/byte, signed/unsigned. The main functions of ABSPAT are: dump and patch words/blocks; chain linked files; boot disk or DECtape; 'Keyboard calculator'. DOS-specific functions are: list block as Master-/User-Directory; Hook/Boot CIL-Files. The papertape version is direct bootable.

Restrictions: Uses 11/40 EIS Instruction Set*Media Price Code:* A2, G18, H32*Format:* DOS-11**OSCAR: Conversational Computer**

11-258

Author: Dr. N. E. Whitehead

Institute of Nuclear Science, LowerHutt, New Zealand

Operating System: RT-11FB VO2-01*Source Language:* FORTRAN IV*Memory Required:* 11K*Special Hardware Required:* Teletype, disk

11-258 (Cont.)

Abstract: OSCAR is a program which converses reasonably intelligently with the user via teletype. It will answer questions or make a relevant comment in approximately 95% of cases. OSCAR will not tackle arithmetic but usually types an appropriate comment about the problem. The overall conversation level is quite coherent, but sometimes slightly illogical. This result is achieved by examining the input material and dividing it into categories on the basis of the first few words. It is thus a 'brute force' example of programming. OSCAR is good party entertainment, but people's reactions also make an interesting psychological study.

Media Price Code: A2, H32

Format: RT-11

MOSFLD: A Least Squares Fitting Routine for Mossbauer and Effect Spectra**11-259**

Author: William R. Owens

Pontifica Universidade Catolica, Rio de Janeiro, Brazil

Operating System: DOS/BATCH

Source Language: FORTRAN IV

Memory Required: 6668

Other Software Required: FORTRAN compiler and library, link with autoload

Special Hardware Required: PDP-11/40 with min. 16K and disk

Abstract: Experimental data from Mossbauer effect spectrum are fitted with a constant background level and N(< 12) Lorentzian shaped dips of equal width but independent positions and depths. An adjustable symmetry point is included among the parameters to handle data accumulated in the triangular wave velocity mode. The constant background level can also be modulated slightly to correct for solid angle variations due to a moving source. Best fit values of the 2N + 4 parameters and a calculated best fit spectrum are output along with χ^2 and statistical uncertainties of the parameters.

Restrictions: Maximum of 12 peaks and 1024 data points for 16 K systems

Media Price Code: D2, G14

SRD: Sort Directory Utility**11-260**

Author: William H. Brown

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11

Source Language: MACRO-11

Memory Required: 8K

Abstract: SRD is a RSX-11M utility allowing a U.F.D. to be sorted into alphabetical order, then listed. The format of default listing is such that it can be easily edited to create an indirect file for PIP, for example, to copy the files. The default order on the files is to sort on the type field first, then by name. The name switch causes the Sort to be done. The name switch causes the Sort to be done by name first.

Media Price Code: A2, H32

Format: DOS-11

LKP. MAC: Improved Lookup Processor for DOS V9, 10**11-261**

Author: Glenn Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH, V9 or later

Source Language: MACRO-11

Memory Required: 255 words

Abstract: This is a modification of the DOS (V09 and V10) lookup processor which saves the device, unit, UIC and directory start block in resident core and uses it to avoid reading the master file directory blocks

where the same user file directory is consulted more than once. This saves 2 disk accesses per open when the same device, unit, and UIC are used as the last lookup. A conditional assembly permits DOS to skip reading the MFD block on DECtape entirely, saving 1 block read per DECtape open. It directly replaces the DEC version with no special provisions. However, this version is suitable for DOS V09 and later only.

Restrictions: If parity memory is present on system, user must find place for resident directory information (4 words) in vectors.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

TRA. MAC: "Real-Time" TRAN Processor for DOS (V9 or later)**11-262**

Author: Glenn Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH, V9 or later

Source Language: MACRO-11

Abstract: A TRAN processor for DOS which works correctly for multiple datasets and for devices which take the driver completion return immediately (i.e., are not interrupt driven). It fixes a DEC bug and permits automatic calling, if required, of a user-specified subroutine upon completion of the driver transfer. This permits asynchronous I/O at device-limited speed, complementing the asynchronous, monitor formatted I/O provided by RTDOS (DECUS 11-172).

Restrictions: Illegal completion routine addresses are not called, and no error message is logged.

Media Price Code: D2, G8

INSFCL: DOS Instrumentation FOCAL**11-263**

Author: Glenn Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 2.7K to 4.8K (depends on cond. ass'y's)

Abstract: Instrumentation FOCAL is a version of the FOCAL interpreter modified for ease of use in instrument testing and data collection. In addition to the normal ("real") data type, FOCAL supports a data type ("vector") consisting of a variable number of contiguous 16-bit integers, treated as a subscripted array. The address of any such array element may be found, and this data type may be used to interface easily to assembler routines. (Documentation for adding new functions is provided on the tape.)

Several functions specially adapted to manipulating integer array data are provided.

Restrictions: Integer vector elements may not be directly entered via ASK. Otherwise, they behave as normal FOCAL numbers.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

SPOOL—11: Generalized I/O Spooler for DOS/MUD/MFT/PCP**11-264**

Author: M. Zimmerman and G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Memory Required: 144 words of scratch buffers and datasets for each

Special Hardware Required: DOS configuration with clock (KW11L or KW11P)

11-264 (Cont.)

Abstract: SPOOL is a program to do multiple device transfers in parallel. Under the PCP, MFT, or MUD systems, it functions as additional users of the PDP11, permitting one to initiate I/O transfers from any dataset to any dataset and do other things while the I/O finishes by itself. Magtape rewind may be suppressed, and the transfer may be in ASCII or binary. Any number of spoolers may be active at a time, up to the limits of available buffer space. I/O may go to any datasets, and is not limited to hard-copy output.

Restrictions: System must have clock

Documentation on Media.

Media Price Code: H32

Format: DOS-11

TECO: DOS-11 TECO**11-265**

Author: Glenn Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH

Source Language: MACRO-11

Abstract: TECO is a powerful and versatile text editing and correcting program useful for people who are at least slightly experienced in on-line editing. This is a superset of PDP-10 TECO implemented to run under DOS-11. A manual file is included. TECO is a character editor, suitable for editing any form of data.

Restrictions: If used with KB=driver, must type ALTMODE twice for every ALTMODE sent to TECO.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

LISTRSX: RSX11D Multi-Column Listing Utility**11-266**

Author: Glenn C. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: RSX-11D V6, IAS

Source Language: MACRO-11

Abstract: This is a program to reformat ASCII text into up to 10 columns from any ASCII file structured as lines of text. It may be installed in an RSX system and used to save paper and time in listings.

Numerous options include the ability to specify how many columns per page are desired; page length and width, whether to truncate lines too long for the columns or have them wrap around within the column. Whether to ignore formfeeds on input or interpret them, whether to compress tabs into single spaces or not, and whether to pause between pages or not. The pause option is convenient for examining long files on CRT terminals a page at a time.

Restrictions: Does not interpret FORTRAN carriage controls—they must be removed by TECO.

Note: Minor edit needed for RSX-11D V4.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

LIFE Game for DOS and Scope**11-267**

Author: G. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: DOS/BATCH (or PCP/MFT)

Source Language: MACRO-11

Abstract: This is an assembly language version of Conway's Game of Life with interactive console control. For DOS or PCP/MFT. Display is

for a scope device (presently a VT01, but easily changed for other scopes). Simple commands permit one to move in all 8 directions, draw points in all 8 directions, erase points, and move in any direction by large steps if desired. For the PCP/MFT system, catalogued procedures are provided which put a glider-gun on the board and allow users to add additional objects, or which put 2 different kinds of gliders on the board and permit user modification. The board is 128 by 128 dots. This program is modified from an RT-11 program for RT-11 written for an LPS system.

Restrictions: Catalogued procedures for PCP/MFT to draw glide gun required PCP/MFT (DECUS No. 11-195)

Documentation on Media.

Media Price Code: H32

Format: DOS-11

CAMAC Support Library for Industrial Systems**11-268**

Author: Dale W. Zobrist

4528 165th Ave. NE, Redmond, WA 98052

Operating System: RSX-11, DOS-11, RT-11

Source Language: ANSI Standard FORTRAN (X3.9-1966)

Abstract: The CAMAC library is an implementation, rather than a specification. It provides a system of ready-made computer-independent software modules which can be referenced by a higher level of programming (i.e., by the application programs.)

Much beyond IML or handlers for specific CAMAC systems, the CAMAC-Support Library for Industrial Systems includes test programs, adaptor programs, and general utility programs. It may be considered analogous to the various instrumentation modules, test equipment, and highway adaptors which support CAMAC systems from a hardware standpoint. The library provides similar support in a software structure.

Written in standard FORTRAN (ANSI X3.9-1966 or ISO Full FORTRAN R/539-1972), the main library includes about 4000 source records in its current release. It is organized into various sub-libraries. A separate file name is suggested for each main program (e.g., a utility program) while related subprograms (i.e., functions and subroutines) are grouped with a file name suggested for each group.

Only partial documentation is offered by DECUS. Users who request software from DECUS should contact the author for current information and documentation.

Media Price Code: A2, H32

Format: DOS-11

RSX-11 BASIC**11-269**

Author: David Beckwith

Lilly Research Laboratories, Indianapolis, IN

Operating System: RSX-11 D or M

Source Language: MACRO-11

Memory Required: Approx. 6K words

Abstract: This RSX-11 version is an adaptation of DEC's PDP-11 4K stand-alone basic (DEC-11-LBSUA-A). The "save" and "old" commands can use any RSX-11 device for storage of programs. There are no provisions for programmed I/O to any device except the user's terminal. This system is useful as a desk calculator or for calculations requiring only small amounts of input data. The best documentation for this system is DEC's "PDP-11 BASIC Programming Manual" (DEC-11-XBPMA-B-D). Documentation and command files are provided with the source files.

Documentation on Media.

Media Price Code: H32

Format: DOS-11

FODT: FORTRAN IV On-Line Debugging Tool*Author:* David Beckwith*Operating System:* RSX-11D, RSX-11M*Source Language:* MACRO-11*Memory Required:* 730 Decimal Words*Other Software Required:* RSX FORTRAN IV

Abstract: This debugging aid allows the user of RSX-11D/M FORTRAN IV and RT-11 FORTRAN IV to monitor the operation of his program using commands similar to ODT. FODT provides a subset of the commands available with ODT such as single stepping, breakpoints, and inspection of several types of variables. FODT can be built into a task without editing or recompiling the source and does not interfere with the normal operation of FORTRAN IV.

*Documentation on Media.**Media Price Code:* D3, H32, M55*Format:* DOS-11**FODT: FORTRAN IV On-Line Debugging Tool
for RT-11***Author:* David Beckwith*Revised by:* Mitchell E. Kawasaki*Operating System:* Naval Research Laboratory, Washington, DC*Source Language:* MACRO-11*Memory Required:* 730 Decimal Words*Other Software Required:* RT-11 FORTRAN IV

Abstract: DECUS 11-270, FODT, has been modified by the addition of assembly conditionals to run under the RT-11 operating system as well as the RSX-11M/D operating systems. Everything supported in the original RSX-11M/D version is supported under RT-11 with the exception of changing LUN's for the console terminal.

*Documentation on Media.**Media Price Code:* D3, H32, K27*Format:* RT-11**SYZER: RT-11 System Sizer***Author:* Wendell Goodwin*Operating System:* Digital Equipment Corporation, Sunnyvale, CA*Source Language:* RT-11*Other Software Required:* MACRO-11*Other Software Required:* RT-11 LP: and TT: Handler

Abstract: This program prints out a description of the PDP-11 system it is run on, including CPU type, CPU options, memory size and address map. It also lists the peripheral devices found on the system by the program.

*Documentation on Media.**Media Price Code:* H32*Format:* RT-11**PDP-11 Utility Routines: ASCIB, JLBITS,
CSISR***Author:* Robert DiGrazia*Operating System:* Harvard University, Cambridge, MA*Source Language:* RSX-11 M for JLBITS and CSISR*Other Software Required:* MACRO-11

Abstract: ASCIB allows FORTRAN programs to execute high-speed conversions in either direction between 16 bit integers and decimal ASCII character strings of specifiable length. It makes no error checks.

11-270A

JLBITS allows FORTRAN programs to execute 8-bit and 32-bit logical operations: AND, OR, exclusive OR, and complement. It also provides 16-bit rotate.

CSISR allows FORTRAN programs to decode MCR command lines, returning file specifications in ASCII strings, and switch codes in variables similar to those returned by RT 11's ICSI. Functions INCSI and IOUTSI extract filespecs and switches from the right and left sides of a command line's equal sign. Function IGTCLM reads an MCR command line.

Media Price Code: A2, G10**FTCHEM: Fast Fourier Transform for CAPS-11
BASIC without EAE**

11-274

Author: T. J. Weslowski and E. F. Beadel, Jr.*Operating System:* State University of New York, Oswego, NY*Source Language:* CAPS-11*Memory Required:* 0.55K words plus data*Other Software Required:* BASIC V01

Special Hardware Required: Standard Terminal and TU-60 for CAPS-11 BASIC

Abstract: FFT is a subroutine designed to be linked to BASIC/CAPS-11 (it could probably be linked with BASIC/PTS or BASIC/RT-11 also) that will enable the user to perform a Fast Fourier Transform on 2 data points, where $2 \leq n \leq$ machine storage capability. It is designed for those systems without EAE, and requires about 16 seconds for a 1K transform. (The equivalent BASIC program requires about 4 minutes.)

Media Price Code: A2, G6**MAP: Disk Block Usage**

11-275

Author: James Stanfill*Operating System:* University Of Washington, Seattle, WA*Source Language:* RSX-11D Ver 6B*Memory Required:* MACRO-11*Special Hardware Required:* 37100 (8) Bytes*Other Software Required:* Terminal (Graphic or Teletype)

Abstract: This task will depict disk usage in terms of blocks allocated. The output (either TI listing or disk file) consists of a map of all logical blocks on the disk. If a block is used, the corresponding word contains the file id. Additional information is contained in the source listing.

Restrictions: This program not suitable for large Disks.*Note:* DECTape and floppy includes 11-276, 11-277, 11-278*Documentation on Media.**Media Price Code:* H32, K27*Format:* FILES-11**REC: File Recovery**

11-276

Author: James Stanfill*Operating System:* University Of Washington, Seattle, WA*Source Language:* RSX-11D Ver 6B*Memory Required:* MACRO-11*Special Hardware Required:* 16000 (8) Bytes*Other Software Required:* Terminal (Teletype)

Abstract: This task will recover variable length record files which have been corrupted. Documentation is contained in the SOURCE LISTING.

A file SUBR.MAC which contains general conversion routines that normally will reside in a library is included in the offering DECTape.

Media Price Code: (Order DECUS No. 11-275)

DTY: Alphabetical Directory Listing*Author:* James Stanfill

University Of Washington, Seattle, WA

Operating System: RSX-11D*Source Language:* MACRO-11*Memory Required:* 30700 (8) Bytes*Special Hardware Required:* TTY-like Terminal

Abstract: This task will provide an alphabetical directory listing of the directory specified by the user. The number of blocks allocated for each file is displayed. The total number of blocks allocated for the directory is also displayed.

Media Price Code: (Order DECUS No. 11-275)**ACC: Accounting***Author:* James Stanfill

University of Washington, Seattle, WA

Operating System: RSX-11D*Source Language:* MACRO-11*Memory Required:* 41500 (8) Bytes*Special Hardware Required:* TTY like terminal

Abstract: This task will tabulate accounting information from the data file created by the system accounting task, ACCLOG. Operation and types of reports produced are documented in the source listing.

Media Price Code: (Order DECUS No. 11-275)**KERNEL: Security KERNEL for the PDP11/45***Author:* William Lee Schiller*Submitted by:* Grace H. Nibaldi

MITRE Corp, Bedford, MA

Source Language: SUE, PAL11*Memory Required:* 64K*Other Software Required:* SUE Compiler, PAL11 Cross Assembler*Special Hardware Required:* Magtape, RF11 Disk 4 Terminals

Abstract: The Security Kernel for the PDP-11/45 is designed to allow within a single computer system controlled access to data of various security levels.

By taking advantage of certain hardware features of the PDP-11/45 memory management unit, it can be invoked on every attempt to obtain information, and at the same time protect itself from tampering and misuse. The Security Kernel regulates access through predefined "right-to-know" and "need-to-know" rules.

Associated Documentation: Volume 1, Volume 2 and Listing is available from MITRE Corp, Bedford, MA 01730

Media Price Code: M55**VBS: IBM to PDP-11 VBS-Format Magtape I/O Package***Author:* Oliver Jones and Tom Powers

Yale University, New Haven, CT

Operating System: RSX-11M V02 BL12*Source Language:* MACRO, FORTRAN*Special Hardware Required:* TM-11 or MM-11 and RSX-11M configuration

Abstract: The VBS subroutine package permits the PDP-11 to read and write magnetic tape which can be directly accessed by IBM System/370 FORTRAN and PL/I programs in binary (unformatted)

11-277

mode. Binary and ASCII-EBCDIC conversion routines allow handling of INTEGER, REAL*4, and character data.

Restrictions: All logical records on magtape must contain an even number of BYTES. No check is made for this condition.

*Documentation on Media.**Media Price Code:* M55*Format:* DOS-11**GETBIN: Change a Paper Tape Binary Program To RSX-11M Bootstrappable Task.**

11-281

Author: Kaarle Kaila

Oy NOKIA AB Electronics, Helsinki, Finland

Operating System: RSX-11M*Source Language:* MACRO-11*Memory Required:* 10KW*Special Hardware Required:* Paper tape reader, DISK

Abstract: The program has been made to be able to get the hardware test programs booted quickly and easily from the disk to core. This means that any programs that the absolute loader can load can be put on disk and thereafter loaded by the RSX-11M BOOT command.

Media Price Code: D2, G6**M.I.T. Garbage Collection #1 and #2**

11-282

Revised: March 1978*Author:* Glenn C. Everhart

Maple Shade, NJ

Operating System: RSX-11D*Source Language:* Miscellaneous*Documentation on Media.**Media Price Code:* A1, N65*Format:* DOS-11**RSX-11 FOCAL**

11-284

Revised: 1 April 1978*Author:* Glenn C. Everhart

Maple Shade, NJ

Operating System: IAS, RSX-11D, RSX-11M*Source Language:* MACRO-11*Associated Documentation:* FOCAL-11 User's Manual (DEC-11-LFOCA-F-D)

Abstract: RSX FOCAL is an interpreter for the FOCAL language that runs as a multi-user task under the RSX11-D, RSX-11M, or IAS systems. Numerous language extensions include octal radix support, full Library facilities - support of I/O up to 8 binary files (including random access files permitting virtual arrays), and vectors. Vectors are integer arrays allocated continuously. They may be addressed as integers or bytes, and full string support is provided by new FOCAL language statements and functions. Moving substrings, conversion of number to ASCII string or back, string comparisons, and substring location are included.

Support for hardware control is extensive. FOCAL may handle up to 8 clock scheduling alarms, up to 15 interrupts (using supervisor space), execute any RSX EMT call, and control the system console (TI:) without the usual implied wait of ASK. 27 non-erasable variables are provided for communication with overlays, and provision is made for variables in global commons if desired. Diagnostics are in English for easy interpretation. Full trig. functions include arctangent, sine, and cosine. Log and exponential are also available (plus square root). Programs may be renumbered, data strings may be executed as FOCAL commands, and a modified IF that calls groups via DO rather than GOTO, are provided. Also, it is possible to break out of FOR loops. Very extensive conditional

11-284 (Cont.)

assemblies allow one to select as many (or few) of these features as desired. The pure segment of FOCAL is about 4.5K; impure sections may be about 1.5K up depending on allocated program space. Documentation shows how to add user functions.

Restrictions: Symbol table dump occasionally gets confused if vectors allocated start other than a 4-word boundary. Harmless to program execution. (FIX available). Hardware floating point very crude and slow. (Use software floating point this revision.)

Note: RSX-11 FOCAL is also included on DECUS 11-287 magtape

Documentation on Media.

Media Price Code: A2, H64

Format: DOS-11

TAGGET: Simple DATA Encriper for RSTS/E-RT-11**11-285**

Author: Cal Page

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS/E RT-11, or RT-11

Source Language: MACRO-11

Memory Required: 8K

Special Hardware Required: 11/34 or higher

Abstract: TAGGET is a simple ASCII data encriper designed for soft protection of priority information on RSTS/E—RT-11 systems.

The technique uses a pseudo-random number generator to do substitutions of the data.

Also a code string is requested from the user for use as a key to the file.

Media Price Code: D2, M55

Format: DOS-11

Utility Package for RSX11-D**11-286**

Author: Glenn C. Everhart

Massachusetts Institute of Technology, Cambridge, MA

Operating System: RSX-11D

Source Language: MACRO-11

Abstract: A package of useful RSX11D functions is offered for users who need them. A partition mapper, indirect MCR supporting replacement for MCR (in most ways) with extensive MACRO capabilities, Disk patcher, and an RSX11-D version of William Brown's "SRD" utility are included.

Restrictions: Disk patcher patches whatever LUN2 is assigned to; no provision for multiple unit patching is there.

Documentation on Media.

Media Price Code: H32, K27

Format: DECtape-DOS-11, Floppy-FILES-11

RSX-11 Cornucopia (formerly MIT RSX Cornucopia)**11-287**

Revised: 8 March 1978

Author: Glenn C. Everhart

Maple Shade, NJ

Operating System: IAS, RSX-11D, RSX-11M

Source Language: BASIC, FOCAL, FORTRAN IV PLUS, MACRO-11, TECO

Special Hardware Required: Special FOCAL functions support MBD-11 versatec Matrix 1100A. These are options, may be excluded by conditional assembly.

Abstract: A collection of programs on 2400' magtape is offered including a greatly enhanced FOCAL interpreter for RSX-11D,

RSX-11M, or IAS, and enhanced TECO with the ability to automatically use command files, buffer output, and support various scope devices, a multicolumn lister, partition map routine, various device handlers, conversions, and miscellaneous utilities. Certain programs (notably SRD) for RSX-11D are also included for the user's convenience, along with an RSX DDT that may be used in a mode where it accesses a terminal directly rather than using the RSX console handful (useful for debugging system components) or in a normal mode using the RSX handlers. A tape positioning MCR task is included in area 4,200, plus a variety of games written in FOCAL, BASIC, FORTRAN, and TECO. (For convenience, sources to BASIC, TECO, RUNOFF, and LIST/RSX are included, along with appropriate document files.) An indirect MXR routine (PCP) is also included, and other routines too numerous to mention. (Many are for RSX-11D or IAS. The others work for any RSX system.) The new FOCAL includes string handling, English diagnostics, schedulable alarms, and many bug-fixes and enhancements. If you have the old one, you should get this version. Documentation has also been greatly expanded. Some FORTRAN programs assume the F4P compiler will be used; most do not.

Restrictions: RSX FOCAL submitted for DECTape does not include special hardware support. The magtape version sources are complete. FOCAL interrupt handling requires Supervisor Mode, access to External Page, and 18-bit addressing for DMA devices as written.

Media Price Code: P85

Format: DOS-11

TECO V28 for RT-11**11-288**

Revised: 22 December 1977

Author: Mario DeNobili, et al.

Submitted by: Herb Jacobs

Digital Equipment Corporation, Maynard, MA

Operating System: RT-11

Source Language: MACRO-11

Abstract: TECO is a powerful text editor that runs under most PDP-11 operating systems. It is suitable for editing most any form of text file, including programs, manuscripts, correspondence, and the like. TECO is a character oriented editor, and as such is free from many of the inconveniences associated with many line oriented editors. In addition, TECO has most of the facilities found in programming languages, such as arithmetic, loops, conditional execution, GOTO's, etc., allowing the user to write editing programs that alphabetize lists, reformat tables, renumber statement labels, and much more.

This new version of TECO includes many new features, such as upper/lower case support, CRT style rubouts, wild card file lookups, bounded searches, and a keypad/scope editor option for the VT-52.

Note: The TECO-11 User Manual (DECUS 11-350) must be ordered separately. Write-up included with this program contains loading instructions only. Complete TECO-11 source files are not available from the DECUS Library.

Media Price Code: A2, H32, K27

Format: RT-11

DEBUG**11-289**

Author: T. L. Pickett

Environment Canada, Canadian Forestry Service, Chalk River, Ontario, Canada

Operating System: RT-11

Source Language: FORTRAN IV

Memory Required: 16K

Special Hardware Required: DECwriter II

Abstract: This program is a very useful debugging tool for users of large files of numeric data. The program scans the data and detects

11-289 (Cont.)
 characters other than numbers, decimals or blank spaces. It also detects blank lines. Program DEBUG prints number of lines scanned at end of run. Data may be typed in any format to be run with this program.

Media Price Code: D1

**MACRO Package for MACRO-11 to Assemble
INTEL 8008 Code**

Author: Bruce Filgate
 Digital Equipment Corporation, Marlboro, MA
Operating System: RT-11
Source Language: MACRO-11

Abstract: This is a set of MACRO routines to interpret DEC MPS (Intel 8008) mnemonics. The output consists of two files; one contains the binary image of the object, the other contains the assembly listing.

Media Price Code: D2, G10

**MACRO Package for MACRO-11 to Assemble
Signetics 2650 Code**

Author: Bruce Filgate
 Digital Equipment Corporation, Marlboro, MA
Operating System: RT-11
Source Language: MACRO-11

Abstract: This is a set of MACRO routines to interpret Signetics 2650 mnemonics. The output consists of two files; one contains the binary image of the object, the other contains the assembly listing.

Media Price Code: D2, G14

SORT: Generalized File Sort Utility

Author: M. J. Pullen
 E.I. duPont de Nemours & Co., Leominster, MA 01453
Operating System: RSX-11M
Source Language: FORTRAN IV and MACRO-11
Memory Required: 8K
Special Hardware Required: RK05

Abstract: The sort file utility (8K memory) sorts records from any input device on up to 20 keys, placing sorted, fixed-length data on any output device. The sorting subroutine package may be placed in the SYSLIB and called in any user written program.

Media Price Code: D3

STAR-TREK (SPACWR) for RSX-11M

Author: Mike Mayfield, Centerline Engineering; *Revised for RSX-11M by Mike Pullen, E.I. duPont de Nemours and Co., Wilmington, DE*
Operating System: RSX-11M
Source Language: FORTRAN IV
Memory Required: 8K w/FCSRES
Special Hardware Required: RK05, TTY device

Abstract: This program simulates the TV program "STAR-TREK".

Media Price Code: D2

Set of Utility Routines for any PDP-11 Machine

Running RT-11 BASIC

Author: N. A. Bourgeois
 Sandia Laboratories, Albuquerque, NM
Operating System: RT-11
Source Language: MACRO-11
Other Software Required: RT-11 BASIC

Abstract: These routines are for extending the capabilities of RT-11 BASIC; they provide the means of reading and writing words, bytes or bits at any implemented bus address; in addition, arrays may be nulled and time of day may be obtained.

Media Price Code: D2, L33

Modified Absloader and Dump Program

Author: Jeffery Kodosky
 Applied Research Laboratory, University of Texas at Austin, Austin, TX
Operating System: PTS
Source Language: PAL
Special Hardware Required: PDP-11/04, 11/34

Abstract: Users of DEC's PDP-11/04 and PDP-11/34 processors will experience some difficulties when attempting to run the paper tape software, specifically the PAL assemblers. The problem consists of two parts. The first is due to the lack of a switch register; PAL expects to use one in its initialization routine. The second is due to a vagary of the console emulator which leaves the processor status work at a high priority when transferring control to a program. A modified absolute loader is offered here which addresses both problems. Also included is a low speed punch memory dump program which doesn't require a switch register.

Media Price Code: D2, F5, G5

**Fast Digital Signal Processing Software Package
for the PDP-11**

Author: L. Robert Morris
 Carleton University, Ottawa, Canada; and Digital Equipment Corporation, Maynard, MA
Operating System: RT-11
Source Language: FORTRAN IV and MACRO-11
Memory Required: Varies

Abstract: This software package consists of a number of digital signal processing programs optimized for maximum speed on PDP-11 computers. Initial components are radix 2 fixed-point FFT, radix 4 floating-point FFT, fixed-point autocorrelation, and floating-point autocorrelation matrix solution. The latter 2 programs are useful in linear predictive speech coding. All fixed-point programs require the EIS instruction set (LSI-11, 11/34, 40, 45, 55, 70) and all floating-point programs require the FPP instruction set (11/34, 45, 55, 70 with FFP). 11/55 (bipolar) benchmarks are: 1024 point real FFT, 62 msec (fixed-point), 89 msec (floating-point); 128 × 12 fixed-point autocorrelation, 32 bit results, 5.3 msec; 12th order floating-point autocorrelation matrix solution, 1.82 msec.

Media Price Code: A2, H32, K27

Format: RT-11

File Utility Programs For MU-BASIC/RT-11

Author: Robert J. Tapp
 University Of Victoria, Victoria, B.C., Canada
Operating System: RT-11
Source Language: BASIC
Memory Required: 1800 Words
Other Software Required: MU-BASIC/RT-11

Abstract: A set of file utility programs written in BASIC which allow the MU-BASIC/RT-11 user to list and modify device directories, perform

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| <p>11-297 (Cont.)</p> <p>file transfers or edit line-formatted ASCII files. Conversion between virtual array and ASCII format files is supported and facilities are included for extensive character string search and manipulation, as well as user defined MACRO editing commands.</p> <p>Restrictions: Removes form-feed characters from text. This is a restriction caused by the INPUT statement of MU-BASIC</p> <p>Media Price Code: A2, G8</p> | <p>NULL Device Handler 11-300</p> <p>Author: Evan L. Solley Operating System: RT-11 Version 2 or later Source Language: MACRO-11 Memory used: 54₈ Words</p> <p>Abstract: NL or NUL can be used as a dummy BATCH LOG: device for debugging, and for maintenance. It is a source of endless zeros, and a sink for output. Listing includes installation notes for RT-11 V2C.</p> <p>Media Price Code: D2, G5</p> |
| <p>11-298</p> <p>QSORTA: Fastest Core Sort-Quicksort Author: A. S. Thompson and S. H. Yamamura Bell Aerospace Textron, Tucson, AZ Operating System: DOS/BATCH V10 Source Language: FORTRAN Memory Required: 6574₍₈₎ Bytes Other Software Required: FORTRAN Library, FTNLIB</p> <p>Abstract: QSORTA is the FORTRAN version of the rapid core sort algorithm, Quicksort, by C. A. R. Hoare. Run time of the Quicksort algorithm is proportional to log_n, where n = number of items sorted. QSORTA requires 6.2 seconds to sort 2000 floating point values, while a comparable algorithm, Shellsort, requires 10 seconds to sort the same number of items; both algorithms were timed on the PDP 11/45. The source listing of QSORTA provides information on modifying the sort to perform a descending, rather than ascending sort and how to sort an associated index array as well as the sort key array.</p> <p>Media Price Code: D2, G5, R30</p> | <p>11-298</p> <p>SEND.MAC: RXS-11D Interterminal Communications MCR Command 11-301</p> <p>Author: Philip D. Brooke Digital Equipment Corporation, Maynard, MA Operating System: RSX-11D Source Language: MACRO-11 Other Software Required: SYSLIB</p> <p>Abstract: SEND is a multi-user MCR command that will transmit a message to another terminal or terminals that exist in a message to another terminal or terminals that exist in the system. Four transmission modes are available to privileged users, two to non-privileged users. The issuer may 1) Send a message to any TTY-like device in the system. 2) Send a message to the operators console. 3) Send a message to all logged-in terminals, or 4) Send a message to all terminals in the system. Modes (3) and (4) are unavailable to non-privileged users.</p> <p>Media Price Code: D2, H32, K27 Format: DECTape-DOS-11, Floppy-FILES-11</p> |
| <p>11-299</p> <p>BENDIX: Handlers and Interface Subroutines for a Bendix Datagrid Coordinate Digitizer, Operating Under BASIC PTS or BASIC RT-11 Author: R. D. Beattie Submitted by: Dr. K. G. McCracken, Chief CSIRO, Div. of Mineral Physics, North Ryde, NSW 2113, Australia Operating System: RT-11 V02C-02-SJ Source Language: PAL11-S; MACRO-11 if using with BASIC RT-11 Memory Required: 2650, in addition to BASIC-PTS or RT-11 Other Software Required: Object modules for BASIC-PTS or BASIC RT-11 Special Hardware Required: Bendix Datagrid digitizer with Bi-directional computer interface</p> <p>Abstract: BENDIX is a package of interrupt handlers and interface subroutines for a Bendix Datagrid * coordinate digitizer interfaced to a PDP-11 operating under BASIC-PTS with strings. The software can also be used with BASIC RT-11 Version 01B in a single-job environment, provided certain restrictions are observed. All data are acquired under interrupt and written into a circular buffer for later transfer to BASIC as ASCII strings. Comment and other manually entered data are entered through the computer teletype keyboard.</p> <p>The package should not require drastic alteration to handle other digitizers and is easily modifiable to run as a stand-alone system.</p> <p>Restrictions: Date not to be INPUT from console when digitizer routines enabled; digitizer interrupts are not disabled on a normal exit from BASIC RT-11 (see write-up chap. 5)</p> <p>Media Price Code: D4, G16</p> | <p>11-299</p> <p>ODT.BAS: Octal Debugging Technique for MUBAS/RT-11 11-302</p> <p>Author: T. Miles University of Victoria, Victoria, B.C., Canada Operating System: RT-11 Source Language: BASIC Memory Required: 1800 words Other Software Required: MUBAS/RT-11</p> <p>Abstract: ODT.BAS is a program employing octal debugging technique, which runs under MUBAS/RT-11 in a multi-user environment. It can be used to make patches to files and directories on file-structured devices. It also will give octal dumps to users specified devices or files. Not recommended for non-privileged users.</p> <p>Restrictions: Does not support split octal.</p> <p>Media Price Code: D1, G5</p> |
| <p>11-303</p> <p>RESEQ.BAS: Line Resequence Programme 11-303</p> <p>Author: T. Miles University of Victoria, Victoria, B.C., Canada Operating System: RT-11 Source Language: BASIC Memory Required: 2200 Words (2000 without 'REM's) Other Software Required: MUBAS/RT-11</p> <p>Abstract: RESEQ.BAS is a program which will renumber up to 120 lines of any RT-11 MUBAS program. The user specifies the input and output files in command decoder format, and then specifies the starting line, number and increment size. Various error conditions are detected and flagged.</p> <p>Media Price Code: D1, G5</p> | |

LISP11*Author:* Jeffrey Kodosky*Applied Research Labs, University of Texas at Austin, Austin, TX**Operating System:* RT-11*Source Language:* MACRO-11*Memory Required:* 16K**11-304**

Abstract: LISP-11 is an interpreter for the LISP language which runs in the background under RT-11. There are 125 LISP functions implemented with provision to conditionally assemble out as many as 60 in order to maximize free space.

Media Price Code: A9, M55*Format:* RT-11**CMMT: Commenting and Lining up Assembler Files****11-305***Author:* Jorg Grimm*EDV Medizinische Poliklinik, Kantonsspital Zurich, Zurich, Switzerland**Operating System:* DOS/BATCH V09 or higher*Source Language:* MACRO-11

Abstract: The tedious job of documenting MACRO programs with the editor is eased with CMMT. As each line of source is printed on the TTY, new comment can be added or old comment retained and lined up to a standard format with too many tabs and spaces cleaned out. Line-up mode can be used alone. "Jump" and "Get Label:" commands facilitate commenting single blocks of code in larger programs. Restrictions: Double labels have to be changed back with the editor after processing.

Restrictions: Does not process double labels to standard format*Documentation on Media.**Media Price Code:* G14**DATMAN: BASIC Data Manipulation Package****11-306***Author:* Nick Hammond*Friern Hospital, Neuropsychology Research Unit, London N11 3BP England**Operating System:* RT-11*Source Language:* BASIC*Memory Required:* 8K

Abstract: DATMAN is a suite of programs written in RT-11/BASIC which allows simple manipulation of numerical data stored on file. Options include: stop data, print data, patch a file, merge files, copy files, selectively extract data, selectively average data, mathematical transformation of data, file arithmetic. All options are controlled via simple question and answer displays. Detailed documentation is included.

Media Price Code: D2, G30**Stage 2 for the PDP-11 Operating under RT-11****11-307***Author:* W. M. Waite and Peter H. Heinrich*University of Colorado and University of Karlsruhe**Submitted by:* D. M. Nesbett*Australian National University, Canberra, Australia**Operating System:* RT-11 V2B*Source Language:* MACRO-11

Memory Required: STAGE 2/RT-11 will not run in less than 12K and is not really useful unless there is 16K (assuming the S/J monitor)

Special Hardware Required: PDP-11/20 + EAE, PDP-11/40 + EIS or PDP-11/45

Abstract: Stage 2 is a general purpose macro processor designed to port software written for abstract machines. The macro processor is itself

portable being written for an abstract machine called "FLUB". This implementation of STAGE 2 is a modification of the DOS-11 version (DECUS No. 11-158 by Peter H. Heinrich) so that it will run under RT-11.

Restrictions: The Stage 2 command "Change I/O Channels and Copy Text" is modified.*Media Price Code:* A2, H32*Format:* RT-11**GT40 Debugger****11-308***Author:* Howard P. Katseff*University of California, Division of Computer Science, Berkeley, CA**Source Language:* MACRO-11*Memory Required:* 4006 octal bytes*Special Hardware Required:* GT40, Keyboard

Abstract: DB is an online debugger for the GT40. All user interaction is via the keyboard and display. DB is supplied as a relocatable program in MACRO-11.

Media Price Code: D2, G18**Line Printer Plot****11-309***Author:* William C. Nowlin, Jr.*Applied Research Laboratories, University of Texas At Austin, Austin, TX**Operating System:* RT-11*Source Language:* FORTRAN*Special Hardware Required:* Terminal or line printer

Abstract: This FORTRAN Subroutine accepts from one to nine real arrays and plots them on an 80 column wide line printer or terminal.

Media Price Code: D2, G8**RT-11 File Conversion Program for Absolute Loader Paper Tapes with SA < 1000****11-310***Author:* Charles T. Apel*Los Alamos Scientific Laboratory, Los Alamos, NM**Operating System:* RT-11 V02C-02D*Source Language:* RT-11 MACRO VM02-12*Memory Required:* 16K*Special Hardware Required:* Disk or DECtape, TTY (LSR) or console terminal + high speed

Abstract: This program loads absolute binary formatted paper tapes of programs occupying and having starting addresses in low core (< 1000) and converts them to .SAV modules which may be loaded and started from the RT-11 monitor.

Restrictions: For loading tapes which do not require use of switch register in loading. Good for formatting or diagnostic tapes.*Documentation on Media.**Media Price Code:* D2, G10, H32*Format:* RT-11**Real Time Sound Modification Programs****11-311***Author:* L. Bryant, W. Seiler, and R. Meyers*Submitted by:* L. Bryant*SYCOM University of South Florida, Tampa, FL**Source Language:* PAL 11S*Memory Required:* 8K*Special Hardware Required:* PDP-11/10, AD01-D, AA11-D

Abstract: A set of five programs which perform several different kinds of modifications to sound processed through the computer, in real time.

11-311 (Cont.)

Functions include a program which produces a delay for reverberation and echo effects, two different programs to shift frequency up or down, a program which outputs the sampled sound in reverse order from entry, and a program which produces a phasing (or flanging) effect. In all cases the sound is samples in from an A to D (AD01-D), processed, then output through a DAC (AA11-D).

Restrictions: Input must be DC level-shifted for unipolar A to D.

Media Price Code: D2, F5, G8

LALR (1) Parser Constructor to Translate Computer Languages**11-312**

Author: David M. Stern

Laboratory For Atmospheric & Space Physics, University Of Colorado, Boulder, CO

Operating System: RSX-11M or D

Source Language: MACRO-11

Memory Required: 10 to 32K Words

Abstract: Of interest to the compiler writer, the program "LALR" constructs a compacted LALR (1) parser from a description of a context-free language which may then be used as the basis for a compiler for that language. LALR (1) grammars encompass a large subset of LR(1) grammars and include most common languages such as ALGOL, FORTRAN, and BASIC. It has been proven that LR(K) parsers are the most efficient parsers known for a large subset of grammars in terms of both space and time. Input to the "LALR" program is a Backus-Naur form representation of the target grammar while output is a state table in "MACRO" assembler or absolute form.

Restrictions: 128 rules maximum in grammar

Documentation on Media.

Media Price Code: A2, K27

Format: FILES-11

RSX-11/DOS-11 DDT—Symbolic Debugger**11-313**

Author: G. Everhart, Maple Shade, NJ

Operating System: RSX-11D/RSX-11M/DOS-11

Source Language: MACRO-11

Other Software Required: Assembler, Linker or TKB

Abstract: A version of DDT, a powerful symbolic debugger, is provided that may be assembled conditionally to run under RSX-11D or RSX-11M, DOS-11, or stand-alone (including with RT-11).

This is reworked from the stand-alone original DDT-11 of Steven Rubin of CMU and has several additional features plus conditionals for use with a variety of DEC operating systems.

The RSX version may be assembled to do all its I/O through the normal console handler, or may be built with access to the console hardware registers to do its own I/O independent of the operating system. Both the DOS-11 and RSX-11 versions know the start address of the programs they are linked with, and may start them with a simple <ALTMODE> G. Console dialogue closely resembles PDP-10 DDT.

Restrictions: User symbols are not automatically known to DDT; most enter from console. Conditional assembly selects operating system.

Documentation on Media.

Media Price Code: A2, M55

Format: DOS-11

RT-11 RUNOFF**11-314**

Author: C. D. Lowenstein

Marine Physical Labs, San Diego, CA

Operating System: RT-11 V02 or later

Source Language: MACRO-11

Memory Required: 4.7K

Abstract: RUNOFF is a PDP-11 program running under RT-11 to facilitate the preparation of typed or printed manuscripts, such as memos, letters, manuals, etc. The user prepares his material on any regular PDP-11 terminal, and writes it onto a file using EDIT11. The user includes not only textual material, but also case and formatting information. RUNOFF then takes the file and reproduces it onto the line printer, teletype or other file to produce a final copy or final file image. It performs the formatting and case shifting as directed, and will also perform line justification, page numbering and titling, etc., as desired.

Documentation on Media.

Media Price Code: A2, H32, K27, M55

Format: RT-11

DIRECTORY: List Disk Directories**11-315**

Author: David P. Sykes

CTEC, Inc., Falls Church, VA

Operating System: RT-11 V2C

Source Language: FORTRAN, MACRO-11

Memory Required: 8K

Other Software Required: FORTRAN, MACRO, SYSLIB

Abstract: The Directory program provides the user with the ability to sort and display the directory of a RT-11 Disk (or DECtape). It is much like the PIP/L switch, but is more flexible. Directory will display for the user a list of all files on the specified device which match the input file specifications. Furthermore, it will sort the directory alphabetically by file name, alphabetically by extension, chronologically by date, in order of increasing size, or the reverse of any of these. In addition, files whose date is either before or after a specified date can be excluded from the directory.

Media Price Code: A1, G18

SPOOL: Foreground Line Printer Spooler**11-316**

Author: Martian W. Rothe

Submitted by: David P. Sykes

Mead Tech Labs, Dayton, OH

Operating System: RT-11 V2 or V3

Source Language: MACRO-11

Memory Required: 3K

Other Software Required: SYSLIB

Special Hardware Required: Line printer

Abstract: SPOOL runs in the RT-11 foreground and lists specified files on the line printer. It offers several improvements over the spooler in the back of the RT-11 manual: multiple copies of a file can be requested. Files can either be retained or deleted after printing.

Media Price Code: A1, G12

IBV-11A FORTRAN Support Package**11-317**

Author: Steve Alpert

Submitted by: Daniel L. Aldrich

Digital Equipment Corporation, Marlboro, MA

Operating System: RT-11 V2C

Source Language: MACRO-11

Other Software Required: FORTRAN

Special Hardware Required: LSI-11, IBV-11A

Abstract: This software provides FORTRAN support for the IBV-11A Interface for the IEEE bus. RT-11 version 2C with FORTRAN is required.

Media Price Code: K27

Format: RT-11

CONSOLE: Change System Console From One Terminal to Another

Author: David P. Sykes
 CTEC, Inc., Falls Church, VA
Operating System: RT-11 V2C
Source Language: FORTRAN
Memory Required: 6K
Other Software Required: SYSLIB

Abstract: CONSOL allows any one of several terminals connected to a RT-11 system thru DL11S to be made the system console by changing the pointers maintained internally by RT-11. The user must edit the file to insert the addresses of his DL11S (up to 6). Then, running CONSOL on the system console will allow the user to make any of the other terminals the effective system console. Changes are made only to the resident monitor, not the disk image.

Restrictions: Only tested for DL-11s

Media Price Code: G5

Nicolet 1090 Digital Oscilloscope Handler and Interface to PDP-11

Author: William C. Nowlin, Jr.
 Applied Research Laboratories, The University of Texas at Austin, Austin, TX
Operating System: RT-11
Source Language: MACRO-11
Special Hardware Required: Drill-C, Nicolet 1090

Abstract: This program uses a DR11-C along with a small user interface (described in the write-up) to read data from a Nicolet 1090 sampling digital oscilloscope. The program was written to be called using RT-11 FORTRAN; however, pains were taken to include sufficient documentation to allow any modifications necessary to implement the program in other ways. Using this program will allow the PDP-11 user to use the Nicolet 1090 as a high speed A/D converter and data buffer in a measurement system.

Media Price Code: D2, G5

FISH: Post and Inter Spike Interval Analysis

Author: Klaus Liebold
 Salk Institute, P.O. Box 1809, San Diego, CA
Operating System: RT-11 V02C
Source Language: MACRO-11
Memory Required: 4K
Other Software Required: Laboratory Applications V03
Special Hardware Required: Laboratory Peripheral System, VT-55

Abstract: FISH.MAC generates two programs which collect, display and store intervals between single neuronal action potentials in real time. ISH counts and orders absolute intervals between spikes, while PISH collects and sums spike intervals after synchronizing pulses. Histograms are constructed and displayed on a VT-55 graphics terminal. Data acquisition rate is 1 KHZ, using double precision arithmetic.

Media Price Code: A2, K27
Format: RT-11

Basic Image Processing System for CAT Scans

Author: M. W. Vannier and M. Oliff
 University of Kentucky Medical Center, Department of Radiology, Lexington, KY
Operating System: RT-11
Source Language: FORTRAN/RT-11
Memory Required: 16K
Special Hardware Required: Disk recommended, Magtape unit

11-318

Abstract: A complete Image Processing Software System written in FORTRAN/RT-11 for processing CAT scan images is available. The system contains programs for decoding magtapes in any arbitrary format and transferring selected contents to disk. Subsequent line-by-line processing of the CAT scan images will produce averages, laplacians, gradients, median smoothing and hyperbolic gray level reassessments for CAT scan images. An application of the system to images from an Ohio Nuclear Delta Scan is described.

Documentation on Media.

Media Price Code: A2, B5, H64, M55

Format: RT-11

MARGOT: A MACRO-Based Generator of Command Language Interpreters

11-322

Author: Paul M. Cashman
 Massachusetts Computer Assoc., Inc., Wakefield, MA
Operating System: RSX-11M
Source Language: MACRO-11
Memory Required: 400 Words
Other Software Required: MACRO-11, Task Builder

Abstract: Command Interpretation, while seldom the most important part of an interactive program, is nonetheless an indispensable part. MARGOT is a system consisting of a set of metalanguage operators which can be used to describe the syntax and semantics of command languages. The operators are implemented as macros which expand to produce operation codes for a "MARGOT machine". The latter is implemented as an interpreter written in PDP-11 assembler language. MARGOT is designed to be a powerful, problem-oriented, easy-to-learn language which corresponds naturally to BNF and allows a command's syntax and semantics to be associated easily. MARGOT includes facilities for definition of syntactic and semantic constructs, iteration, and specification of input and syntactic choice. The assembly-time and run-time actions of the MARGOT system are presented. MARGOT is an operating system independent.

Restrictions: (1) MARGOT will not work for recursively defined languages. (2) MARGOT-generated interpreters can only be called from MACRO-11 programs.

Media Price Code: A7, M\$5

Format: DOS-11

Picture Book

11-323

Author: Bob Friedenthal
Submitted by: Hank Maurer
 Digital Equipment Corporation, Marlboro, MA
Operating System: RSX-11D or M
Source Language: MACRO and FORTRAN IV
Memory Required: 8K GT40, Code 1-1/4K, additional memory to 28K
Special Hardware Required: GT40 connected to RSX-11 D/M system (RSX-11D, V4A or later)

Abstract: PICTURE BOOK is a set of programs which run interactively between a RSTS/E or RSX-11D System and a GT40 or GT42 Graphics Display Terminal. The package consists of three parts: a down-line loader; a communication and display file handler; and a set of FORTRAN (RSX-11D) graphics subroutines or BASIC (RSTS/E) functions.

The loader runs on the host system and loads PDP-11 binary files into the graphics terminal over the communications line.

The communications and display file handler is a compact routine residing in about 1.5K words of memory on the graphics terminal.

The graphics subroutines run on the host PDP-11 and are called by a user's application program. Each subroutine generates a string of ASCII characters to the terminal which the handler will interpret.

Media Price Code: A4, H32

Format: DOS-11

MUMPS Utilities*Revised:* 1 June 1977*Author:* James E. Peebles

University of Arizona, Tucson, AZ

Operating System: MUMPS-11*Source Language:* MUMPS

11-324

sideways on the keyboard to move your paddle up and down; your opponent does the same. Moving both fingers one adjacent key closer to keyboard center jumps the paddle four steps instead of one. There are beeps, too: one for bounce, two for serve, and three for miss. Block digit scoring, right or left "wall", and selectable paddle size and ball speed are also featured.

Restrictions: Requires RSX-11M System with "Unsolicited input CHAR.AST" and "Read with no echo" support.

*Documentation on Media.**Media Price Code:* A1, K27*Format:* FILES-11

Abstract: This is a set of utility programs: Directory List (% DL), String of Part Number Search (% SR), Program Save (% SP), Program Restore (% PR), Program Kill (% PK), Program Compare (% CM), Program List (% LP), Assign Sequential Disk Processor (% AA, % A) and Global Utilization (% JJ).

Media Price Code: (Order DECUS No. 11-362)**HIDE: Hidden Line Removal/Plotting Subprogram**

11-325

Author: M. Vannier and M. Oliff

University of Kentucky Medical Center, Department of Diagnostic Radiology, Lexington, KY

Operating System: RT-11 V2C*Source Language:* FORTRAN/RT-11*Memory Required:* 16K or more*Other Software Required:* Plotter Subroutines*Special Hardware Required:* Plotter (Pen or Electrostatic)

Abstract: A 2-dimensional plot of a 3-dimensional surface is generated using repeated calls to a FORTRAN subroutine, HIDE.FOR. Hidden portions of each subsequent curve are removed. The remainder of each curve is plotted. Axes with tick marks and labels may optionally be generated. This subroutine presently uses a Versatec D1200A electrostatic plotter or a HOUSTON COMPLOT DP-1 pen plotter. Virtually any pen or electrostatic plotter may be used. An example program which generates a surface plot is provided. The HIDE sub-routine is based on Williamson's algorithm.

Media Price Code: D2, H32, M55*Format:* RT-11**Enlarged Character Printing Utility**

11-326

Author: Charles Cormier

Digital Equipment Corporation, Marlboro, MA

Operating System: MUMPS-11*Source Language:* MUMPS-11*Memory Required:* Less than 3K partition

Abstract: This program accepts an ASCII string from the user up to 132 characters in length and reproduces each character up to 12.5 inches in height on the user assigned device.

Media Price Code: D2 (Order magtape DECUS 11-362)*Format:* DOS-11**VTPONG: RSX-11M Task To Play Pong Using VT52 or VT55 Terminal**

11-327

Author: J. L. Frost

Chevron Research Company, Richmond, VA

Operating System: RSX-11M*Source Language:* MACRO-11*Memory Required:* 11100 Bytes*Other Software Required:* IO.ATA & TF.RNE Terminal Driver*Special Hardware Required:* VT52 or VT55 Terminal (9600 BAUD)

Abstract: If you play Pong on your TV, you'll like VTPONG on a terminal screen. You put the index and middle fingers of one hand

VT, BD, BD011, and IOS

11-328

Author: Carl W. Akerlof

University of Michigan, Randal Lab, Physics Department, Ann Arbor, MI

Operating System: RSX-11D*Source Language:* MACRO-11*Memory Required:* VT and BD: 1024 Decimal words, BD011: 1255 Decimal words, IOS: 1108 Decimal words

Abstract: VT This is an RSX-11D device handler explicitly written for the Tektronix 4010 Graphic Display Terminal. It was coded to handle various features of the 4010 scope including cursor control for interactive use. The handler correctly interacts with MCR so that the 4010 can be used as a monitor control device. VT is a RSX-11D version of DECUS 11-130.

BD This is an RSX-11D device handler for an EG&G BD-011 CAMAC branch driver. This driver was written to enable flexible and efficient use of the EGG CAMAC branch driver, particularly with regard to LAM initiated data transfers. For use where a single task must control the branch driver, a subroutine, BD-011, is provided which reduces the task switching overhead incurred by the RSX-11D system.

IOS IOS is a formatting package for access by assembly language routines. It performs the conversion of single and double precision integers and floating point numbers to or from an ASCII data set. The IOS package communicates with the data set through the RSX file services routines; thus the formatting is completely device independent. The format control statement is identical to the standard FORTRAN conventions; A, D, E, F, L, O, R, X, and H format descriptors can be concatenated within the usual FORTRAN parenthetical constructions. (FP-11 floating point procession required for D, E, F, L format conversions.) IOS is an RSX-11D version of DECUS 11-109. THE DOCUMENTATION is in comments on the program source files. Additional documentation available from the author.

*Documentation on Media.**Media Price Code:* H32*Format:* DOS-11**ACCLOG: Task Accounting Package For RSX-11MV3.0**

11-329

Author: Greg Bassett

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M V3.0*Source Language:* MACRO-11*Memory Required:* MAX-4.7K words Min 1.3K TYP 1.5K

Abstract: The task accounting package is a set of privileged tasks and various indirect command files used to provide a system capable of compiling statistics on any number of tasks. Those statistics consist of the following: 1) Total elapsed time (From task request to task exit); 2) Total CPU time (Actual CPU time used including EXEC overhead for the task); 3) Total number of QIO's Issued.

Optionally available is the capability, system-wide, to compile information on system usage. That is, percentage of time spent in: Kernel Mode, Null task, User tasks.

11-329 (Cont.)

A system generation is *not* needed to provide support for this package. Output normally is printed on the terminal. However, optionally, the output can be written to any FCS supported device.

The accounting package will run on any normal (and most modified) RSX-11M V3 systems, mapped or unmapped.

Media Price Code: D3, H32, M55

Format: DOS-11

11-333**TECO V28 for RSX-11M**

Author: Andrew C. Goldstein/Mark Bramhall
Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M

Source Language: MACRO-11

Abstract: TECO is a powerful text editor that runs under most PDP-11 operating systems. It is suitable for editing most any form of text file, including programs, manuscripts, correspondence, and the like. TECO is a character oriented editor, and as such is free from many of the inconveniences associated with many line oriented editors. In addition, TECO has most of the facilities found in programming languages, such as arithmetic, loops, conditional execution, GOTO's, etc., allowing the user to write editing programs that alphabetize lists, reformat tables, renumber statement labels, and much more.

This new version of TECO includes many new features, such as upper/lower case support, CRT style rubouts, wild card file lookups, bounded searches, and a keypad/scope editor option for the VT-52.

Restrictions: Must be reassembled to run on RSX-11M V1, V2, or V3 if the terminal handler does not have "read pass all".

Note: The TECO-11 User Manual (DECUS 11-350) must be ordered separately. Write-up included with this program contains loading instructions only. Complete TECO-11 source files are not available from the DECUS Library.

Documentation on Media (Magtape only.)

Media Price Code: A2, H32, K27, M55

Format: Floppy - RT-11, Other - DOS-11

RENUMBERER**11-330**

Author: Dr. M. Pilot

Submitted by: Ron Ginger

Digital Equipment Corporation, Maynard, MA

Operating System: MUMPS-11 V4

Source Language: MUMPS

Abstract: The RENUMBERER is a general purpose utility meant to be used in conjunction with the program editor for facilitating the writing of MUMPS programs.

The Code resides in a global and is executed from the variable space—using the loaded program as data.

It is called much like the Editor: D %R

The RENUMBERER makes much use of the new features of version 4. It will not run on version 3.

Media Price Code: (Order DECUS No. 11-362)

VT-55 Plotting Utility**11-331**

Revised: 12 December 1977

Submitted by: Ron Ginger

Digital Equipment Corporation, Maynard, MA

Operating System: MUMPS-11 V4

Source Language: MUMPS

Abstract: The VT55 Plotting Utility is a collection of MUMPS-11 routines to support the graphic capability of the VT55 terminal, including the ability to display two graphs of 512 points each as either curves or histograms. In addition, routines are provided to utilize the VT55's cursor and grid line capability.

Media Price Code: A2 (Order Magtape DECUS No. 11-362)

MUMPS-11 Program Documentor**11-332**

Revised: 12 December 1977

Author: Ron Ginger

Digital Equipment Corporation, Maynard, MA

Operating System: MUMPS-11 V4

Source Language: MUMPS

Abstract: This is a set of MUMPS-11 routines to aid in the creation of program and GLOBAL documentation. The package includes an editor for input and correction of free text entries in a structured format appropriate to program documentation. There are also output routines to print an index of the documentation and properly formatted output.

The package starts at routing DDD and is very interactive including self help capabilities (when in doubt enter "?" for help). The editor operation mimics the MUMPS function of WRITE, ERASE and MOD-IFY.

Media Price Code: (Order DECUS No. 11-362)

11-334**TECO V28 for RSX-11D/IAS**

Revised: 15 November 1977

Author: Andrew C. Goldstein/Mark Bramhall
Digital Equipment Corporation, Maynard, MA

Operating System: IAS or RSX-11D

Source Language: MACRO-11

Memory Required: 10K Words minimum

Abstract: Same as DECUS 11-333.

Restrictions: Must be reassembled to run on versions of RSX-11D prior to V6.2.

Documentation on Media (Magtape only.)

Media Price Code: A2, H32, K27, M55

Format: Floppy - RT-11, Other - DOS-11

11-335**Reverse Assembler for RT-11**

Author: Dr. S. C. Chou and Mr. K. F. Yee

University of Malaya, Kuala Lumpur, Malaysia

Operating System: RT-11 Version 2

Source Language: MACRO-11

Abstract: This program (RASM.MAC) converts RT-11 disk files to a form similar to the output of other reverse assemblers. The output listing of words can be given in ASCII and in instruction form. The user can specify several switch options in the standard RT-11 command string format to obtain reverse assembly listing of any block of a particular file.

Note: Program disassembles runnable image files only.

Media Price Code: A2, K27

Format: RT-11

DATE

Author: Alan MacInnes
 The Bedford Group, Chelmsford, MA
Operating System: RT-11
Source Language: FORTRAN IV

Abstract: DATE is a program that can change the date in the RT-11 directory entry for a given file. Dates must be in a form acceptable to the monitor DATE command.

Example:

```
.R DATE
FILE: FILE.EXT
DATE: 2-Mar-77
FILE:
```

Documentation on Media.

Media Price Code: K27, M55
Format: RT-11

RT-11 General Purpose Magnetic Tape Handler

Revised: May 1978
Author: N. A. Bourgeois, Jr.
 Sandia Laboratories, Albuquerque, NM
Operating System: RT-11 V2 or later
Source Language: FORTRAN IV and MACRO-11
Special Hardware Required: TM-11 magnetic tape

Abstract: Two FORTRAN applications are included with this package which make it possible to read and write DOS-11 format magtape under the RT-11 Operating System. They are RDOSMT.FOR and WDOSMT.FOR which read from and write to 9 track magnetic tape respectively. Complete instructions are included as comments within each of these programs.

The actual magnetic tape handler, EXTMT.MAC, is much more general, and is a FORTRAN callable handler written in RT-11 MACRO. It is capable of reading or writing tapes in any arbitrary format. As herein implemented the tape density is 800 bpi (core dump mode for 9-track), lateral parity is even and the tape must be mounted on drive 0. No interrupts are used. To change any of these fixed parameters it is necessary to change the command prototype labeled "COMMAND" in the assignments section as required prior to assembly of the subroutine. The conditional assembly switch "CHANGE" is provided for this purpose. Complete instructions on the FORTRAN calling sequence are presented in a description section. Also, both a sample FORTRAN program and user assembly instructions are given.

Documentation on Media.

Media Price Code: K27, M55
Format: RT-11

GRADES: Grading, Recording, & Analyzing

Diverse Evaluations of Students
Author: C. Michael Levy, Ph.D, and Marc Durnin
Submitted by: C. Michael Levy, Ph.D.
Operating System: RT-11
Source Language: BASIC

Abstract: "GRADES" is a system of 16 programs whose overall functions are to score objective examinations; perform detailed item analyses; determine means, SD's and frequency distributions of tests; permit the instructor to modify test scores or to enter grades for essay exams, oral or written presentations and other endeavors; maintain a "gradebook" and provide a display of scores for each exam for posting; and allow the instructor to differentially weigh each student's entries plus establish unique upper and lower limits for each measure prior to calculating the overall course grade for all students.

Media Price Code: D8, M55
Format: RT-11

11-336**MACSP: MACRO-11/SP Structured Programming Macros**

Author: D. L. Heron
 SAENET Programming Services, Ingle Farms, South Australia, Australia
Operating System: RT-11, RSX-11D/M, IAS, DOS/BATCH
Source Language: MACRO-11

Abstract: MACRO-11/SP is a set of MACRO-11 macros which provides a concise, comprehensive set of control structures for assembler programs. The facilities provided are IF...ELSE..FI, LOOP..REPEAT, CASE..CASEND, PROC..END and CALL.

The facilities are specified so as to be efficiently implemented by in-line code; resulting programs are as good as would be coded by hand within the same structural constraints. At the same time the structures are simple to use.

Use of MACRO-11/SP provides a significant pay-off in increased programming efficiency, with negligible loss of run-time efficiency.

Documentation on Media.

Media Price Code: A2, H32
Format: DOS-11

11-337**ADVENTURE**

Author: W. Crowther, D. Sutton
Submitted by: Bob Supnik
 Digital Equipment Corporation, Maynard, MA
Revised by: Kent Blackett, Bob Supnik
Operating System: RT-11 and RSX-11
Source Language: FORTRAN IV and MACRO-11

Abstract: Adventure is a magical, unpredictable, and often addicting computer game that has caught on in the United States in near epidemic proportions.

It is a treasure hunt with all the trimmings—mysteries and challenges that grow more and more complex as the game unravels. Adventure is more of a puzzle than a game. Once solved, it's mastered. The mastering, however, often takes months of drawing maps and planning strategy.

Adventure's sweeping popularity lies in its power to enchant. Players are projected into a world of fantasy, one that blends the heart-pounding suspense of Treasure Island with the magic of Alice in Wonderland.

This version of ADVENTURE is based on two previous versions:
 1. A FORTRAN-10 version by Willie Crowther and Don Woods.
 2. A FORTRAN IV-PLUS version done by Ken Blackett.

Documentation on Media.

Media Price Code: A2, H32, K27
Format: RT-11

11-338**CALC: A Calculator Program**

Author: Peter Baum
 Digital Equipment Corporation, Maynard, MA
Operating System: RSX-11M V3.0
Source Language: FORTRAN IV
Memory Required: 26K Words

Abstract: CALC is a calculator program especially designed for the system programmer and features the ability to perform calculations in decimal, hexadecimal, and octal. Multiple precision numbers of up to 99 digits can be manipulated. Additional features make the program useful for a wide variety of calculations.

Expressions are entered for evaluation using a syntax almost identical to that of FORTRAN IV. These expressions may include variables as well as functions such as SIN and DLOG. Variable names are restricted to a single alphabetic character and may be any of 9 different data types. These data types include INTEGER (INTEGER*4), REAL (DOUBLE PRECISION), HEXADECIMAL, OCTAL, MULTIPLE PRECISION BASE 10, MULTIPLE PRECISION BASE 8, MULTIPLE PRECISION BASE 16, and ASCII. The latter data type is useful when making ASCII

11-339

11-341 (Cont.)

code conversions. Entering OCTAL or HEXADECIMAL constants is facilitated by a provision to alter the default base. Files of expressions or commands can be executed with up to 5 levels of nesting.

Sources are included and it should be relatively easy to convert the program for compilation under a variety of operating systems and machines. Except for heavy use of LOGICAL*1, almost all codes comply with the ANSI Standard. The compiler should, however, be able to perform INTEGER*4 and REAL*8 calculations. Extensive documentation and a 26K overlayed and 31K nonoverlayed task image for use under RSX-11M are provided.

Note: Printed User's Guide includes flow charts for the major routines. There exists a machine readable file of the User's Guide on the distribution tape. The distribution tape does not contain any flow charts.

*Documentation on Media.***Media Price Code:** A2, E5, N65**Format:** DOS-11**11-342****DECODE V01J****Author:** Michael LeVine

Naval Weapons Center, China Lake, CA

Operating System: RT-11**Source Language:** MACRO-11

Abstract: DECODE is a program written to run under RT-11 operating system to decode .SAV and .LDA files into their equivalent MACRO code complete with self generated labels, symbol table, cross reference table, octal, ASCII and RADIX 50 equivalents.

The output can be run through the MACRO assembler and linked to recreate the original file. By the use of switches the output code can be made to reflect the instruction set of one machine configuration only instead of all possible instructions.

*Documentation on Media.***Media Price Code:** A2, M55**Format:** RT-11**11-343****ED - Scrolling Video Text Editor****Author:** Wayne Rasband

National Institute of Mental Health, Bethesda, MD

Operating System: RT-11**Source Language:** PASCAL**Memory Required:** 20-28K**Special Hardware Required:** VT52 or VT55 terminal

Abstract: ED is an easy to learn, easy to use scrolling video text editor for use with a VT52 or VT55 terminal and the RT-11 operating system. The terminal's screen is treated as a "window" through which the user views a 24 line section of a text file. Single keystroke commands, whose effects are immediately visible, provide standard text editing functions.

Media Price Code: D2, K27, M55**Format:** RT-11**11-344****BB - Bit Bucket Device Handler For RSX-11D****Author:** David S. Kelly

Teledyne Controls, El Segundo, CA

Operating System: RSX-11D, V6B or later**Source Language:** MACRO-11**Memory Required:** Less than 1K words**Other Software Required:** FORTRAN IV-PLUS

Abstract: BB is a device handler task which is useful for running programs when some peripheral hardware is unavailable, or when

particular program output is not desired (the output may be re-directed or re-assigned to device BB). The handler accepts all QIO's directed to it and can process them in a variety of ways.

The user determines how each QIO function code is handled by writing a dispatch table which is task-built into BB. The table may be entered directly using an editor, or a utility program written in FORTRAN IV PLUS (hence the "other software required" note above) may be used to build the dispatch table automatically.

*Documentation on Media.***Media Price Code:** A1, K27**Format:** FILES-11**Square Root Routine For Integers****11-345****Author:** Thomas C. Lee

Digital Equipment Corporation, Maynard, MA

Source Language: MACRO-11

Abstract: This PDP-11 assembly subroutine takes the square root of a 16-bit integer. The result in RO contains both integer and fraction portion of the root, that is, with an implicit decimal point between RO(7) and RO(6).

This subroutine uses only a total of 26 words memory.

Media Price Code: D1**Format:** RT-11**PASCAL Compiler for the PDP-11 (Swedish Version V04)****11-346****Author:** Seved Torstendahl

LM Ericson, Sweden

Submitted by: John R. Barr

Hughes Aircraft Co., Los Angeles, CA

Operating System: RSX-11M, RSX-11D, IAS, RSTS/E**Source Language:** MACRO-11, PASCAL**Memory Required:** 31K (RSX), 28K (RSTS)

Abstract: The Swedish Pascal compiler is written in Pascal and runs on PDP-11 computers under the RSX-11M, RSX-11D, IAS, and RSTS operating systems. It compiles Pascal source files and generates a source file listing (optional) and relocatable binary object file (optional) acceptable to TKB. It has a complete Pascal run-time library encompassing the full standard Pascal (Jensen and Wirth) run-time library and some additional routines specific to the RSX operating system environments. It is possible to access MACRO and FORTRAN routines as external procedures. The compiler was originally implemented by Seved Torstendahl and modified by the PASCAL SIG. The compiler itself must be cross-compiled on a DEC-10/20 system. However, user programs can be compiled on PDP-11 systems with a partition of at least 32K (28K on RSTS). This compiler represents the current offering of the PASCAL SIG until it can be replaced by a more efficient compiler currently under development.

*Documentation on Media.***Media Price Code:** A2, M55**Format:** DOS-11**Simulation Of Electron Paramagnetic Resonance****11-347**

Powder Spectra

Author: David J. Lowe

University of Sussex, E. Sussex, U.K.

Operating System: CAPS-11**Source Language:** PAL-11

Abstract: This module provides a user defined function for use with BASIC-11 for simulation of spin effective = 1/2 electron paramagnetic

11-347 (Cont.)

resonance powder spectra. Input parameters are 3 principal g-values, details of 3 sets of anisotropic hyperfine interactions, anisotropic linewidths, microwave frequency and the magnetic field range. It runs 5-7 times faster than the equivalent BASIC program. Input to and output from the module are via arrays specified in the CALL statement.

Media Price Code: A1, L33

Format: CAPS-11

BNR Utilities**11-348**

Author: M. Blake-Knox, A. Leung, D. Ross

Submitted by: M. Blake-Knox

Bell-Northern Research, Ottawa, Ontario, Canada

Operating System: RSX-11M V2, RSX-11D V6, or IAS V1.1

Source Language: MACRO-11/FORTRAN

Abstract: This is a set of utilities used at Bell Northern Research on the various RSX-11 operating systems. The Utilities will:

- produce a formatted dump of a file or device (including file header)
- produce a summary report of disk usage
- report the distribution of free blocks on a disk
- format error messages
- remove bad file headers from a FILES-11 volume

Documentation on Media.

Media Price Code: A3, M55

Format: DOS-11

TCU-100 Clock Daemon For Digital Pathways**11-349**

UNIBUS Clock/Timer

Author: James M. Reardon

Lunday Thagard Oil Company, Irvine, CA

Operating System: IAS/RSX-11M

Source Language: MACRO-11

Abstract: TCU-100 is a daemon task which is to be installed via VMR to run ten clock ticks after the system is booted. It copies the current date and time from the unibus registers of the Digital Pathways TCU-100 clock module into the executive.

If the powerfail and mark time directives are present in the system, both are executed to have the task awakened after powerfail or periodically to keep the system clock and the TCU-100 in agreement. If both directiveness are not present, the task simply exists.

Documentation on Media.

Media Price Code: A2, M55

Format: DOS-11

TECO-11 Manual**11-350**

Abstract: This is a 92 page manual with complete instructions for using TECO-11 version 28. It includes a detailed explanation of all the TECO commands and editing functions and the use of control characters; separate appendices for RT-11, RSTS/E, and RSX-11; explanation of error messages; and a four page summary/index of all TECO command characters and functions.

This manual is recommended for use with DECUS 11-288, 11-333, 11-334, and RSTS11-105.

Media Price Code: E8

GATREC, GATDPY**11-351**

Author: Jau-Lin Ding

College of Podiatric Medicine, Philadelphia, PA

Operating System: RT-11

Source Language: BASIC LPS

Special Hardware Required: Laboratory Peripheral System, Forcplates, and Charge Amps. 2 RKO5s recommended

Abstract: GATREC is a package of programs which includes seven (7) subprograms to record the forces of human gait, and individual data of new or old patients. Three (3) dimensional forces, torque along Z axis and center of force of the gait of right foot plus Z and Y directional forces of the left foot are recorded. Forces are normalized by (weight of the subject) and the torque is by (weight of subject * 1 ft.) Z force is set at 50 lbs/unit, Y and X forces are set at 5 lbs/unit. I.D., No. of the patient is automatically incremented, and the data of the visit are also recorded.

GATDPY is a program package to allow user to display the data of human gait which were recorded by GATREC package. Eleven (11) subprograms can display curves on screen of VT-14 by separated or combined forces of both feet, and the display can be jumped to any curve by your command. File can be found by patient's name or the I.D. number. It also is able to show you the history of visit. Those curves are displayed with scales and also can superimpose another curve for the purpose of comparison.

Media Price Code: D3

DR11-A/C Loadable Driver with Build Package**11-352**

Author: Roy J. Fehlandt

NASA Kennedy Space Center, FL

Operating System: RSX-11M V3

Source Language: MACRO-11, FORTRAN IV

Memory Required: 3250 8 Bytes

Abstract: The DR11-A/C Loadable Driver will allow a user to access up to sixteen (16) DR11-A or DR11-C general device interfaces using standard QIO procedures under an RSX-11M Version 3 mapped system. The driver supports read, write, attach, detach, and interrupt requests. Interrupts are realized by the setting of event flags in the task, thereby eliminating the need for the user to handle the interrupt himself.

A build package, consisting of all sources for the driver, plus a command build file, and a set of sources for FORTRAN IV callable routines to control the driver, as well as full documentation, are included in this release version.

Restrictions: Loadable Driver Support with associated Exec Routines required.

Documentation on Media.

Media Price Code: H32, M55

Format: DOS-11

OS/8 To FILES-11 Source Program Converter**11-353**

Author: Stephen S. Bates

Submitted by: Richard N. Stillwell

Baylor College of Medicine, Houston, TX

Operating System: RSX-11D

Source Language: FLECS/FORTRAN

Special Hardware Required: DECTape

Abstract: OS2RSX uses DX, the PDP-8-format DECTape handler for RSX-11D/IAS (DECUS No. 11-355) to locate and read an ASCII file from PDP-8 OS/8 DECTape and list, punch, or store it in FILES-11 format. The user supplies the input file name and the output device and file name. The FLECS source (OS2RSX.FLX), a FLECS listing

11-353 (Cont.)
 (OS2RSX.FLL) and the FORTRAN source (OS2RSX.FTN) are provided. The FLECS listing serves as documentation for installations without a FLECS preprocessor.

Note: DECUS No. 11-354 and 11-355 are included with this program.

Media Price Code: D2, H32, K27

Format: DOS-11

PDP 8 Cross-Assembler for RSX-11D

Author: Stephen S. Bates and Richard N. Stillwell

Baylor College of Medicine, Houston, TX

Source Language: FORTRAN, MACRO-11

Special Hardware Required: Paper tape punch

11-354

Abstract: PL8RSX is a PDP-8 cross-assembler based on PAL8.11 (DECUS No. 11-201), modified to run under RSX-11D. Input to the assembler is from a PAL8 source file on disk. Binary output is to the paper tape punch (device PP:) and the listing goes to the line printer (LP:). The assembler (PAL8.11) has been modified (a) to run as a subroutine called by a FORTRAN main program, (b) to call FORTRAN subroutines to do I/O, (c) to generate literals and off-page indirect references, and (d) to handle TEXT and TEXTZ pseudo-ops.

Media Price Code: (Order DECUS No. 11-353)

DX: PDP-8 Format DECTape Handler

Author: Stephen S. Bates and Richard N. Stillwell

Baylor College of Medicine, Houston, TX

Operating System: RSX-11D

Source Language: MACRO-11

11-355

Abstract: DX is a read-only RSX-11D device driver for PDP-8-format DECTapes to facilitate transfer of programs and data from a PDP-8 to a PDP-11. Up to 4 blocks (516 PDP-8 words; can be changed by conditional assembly) can be read by one request. Data are returned one 12-bit PDP-8 word in one 16-bit PDP-11 word, right justified. The driver has been used on a PDP-11/45 under RSX-11D V6.B. Some modification would be required to use it on a PDP-11/70 or under IAS.

Restrictions: Read only handler. Required modification for IAS or PDP-11/70.

Media Price Code: (Order DECUS No. 11-353)

FORODT: FORTRAN Debug Routine for RT-11

11-356

Author: Duncan N. Tanner

Sandia Laboratories, Albuquerque, NM

Operating System: RT-11

Source Language: MACRO-11

Abstract: FORODT is an extension of ODT allowing runtime debugging of RT-11 FORTRAN programs. Eight FORTRAN breakpoints may be set and cleared at runtime. Data can be displayed and modified in octal, decimal integer, single and double precision floating point. A "GOTO" command is provided to alter the order of execution. All features of ODT are included so assembly language subroutines can also be debugged.

Media Price Code: A2, H32, K27

Format: RT-11

MTPS and MFPS Emulator

11-357

Author: Thomas C. Lee

Digital Equipment Corporation, Maynard, MA

Operating System: RSX-11M V3 or later

Source Language: Microprogramming

Other Software Required: Microprogramming Tools

Special Hardware Required: PDP-11/60 and U.C.S.

Abstract: This microprogram, after properly loaded to PDP-11/60 U.C.S., will allow users to use MTPS and MFPS instructions which are only available on PDP-11/03, 11/35, and 11/40. The program must be assembled and loaded through the use of microprogramming tools (KU116 - AE, - AT, or - AZ) under RSX-11M operating system.

Media Price Code: A2, H32

Format: DOS-11

LINK - FORTRAN Callable Task Linking

11-358

Author: David R. Dickey

Eastman Kodak Company, Rochester, NY

Operating System: RSX-11D V6.2

Source Language: MACRO-11

Memory Required: INSRUN = 608 words, LINK = 139 words

Abstract: "CALL LINK" allows a program (x) to start up another program (y). It is not necessary for program "y" to be installed. "INSRUN" performs a "INS Y/RUN=REM" on behalf of the calling program (x).

LINK builds and sends a matrix to "INSRUN". "INSRUN" is an installed task and must be privileged.

Restrictions: "INSRUN" must be installed. Restrictions noted in Write-up.

Media Price Code: A2, M55

Format: FILES-11

SORT - Utility ASCII Sort

11-359

Author: Keith R. Craft, Jr.

Teledyne Controls, El Segundo, CA

Operating System: RSX-11

Source Language: FORTRAN IV PLUS

Memory Required: 14K

Abstract: The Utility ASCII Sort is a multi-user task running under RSX-11 that is controlled from a terminal, a batch stream, an indirect command file, or an appropriate combination. I/O and command files must reside on the system disk. Flexible record length and sort field specification. Sample sort time: 4000 240 byte records (55 byte keys) in approximately 18 minutes (PDP-11/70, RPO4).

Restrictions: Input file limited to 40,000 records. Sort keys limited to 80 bytes. Maximum record length arbitrarily set at 320 bytes (can be modified).

Media Price Code: D2, K27

Format: FILES-11

RSX-11 TECO with Buffered Typeout and VT52

11-360

Window Support, plus TECO DOCTOR Game

Submitted by: G. Everhart

Maple Shade, NJ

Operating System: RSX-11D or RSX-11M

Source Language: MACRO-11

Abstract: Fast Scope-Using TECO for VT52, RSX: A version of TECO is provided which will allow use of TECO with a VT52 terminal

11-360 (Cont.)

as a scope editor displaying a "window" around your position in the text. A macro to allow TECO to do this, and a document file describing resulting special features of scope operation.

Note: Scope MACRO for TECO requires the version of TECO submitted. Must be changed slightly for non-VT52 terminals.

DOCTOR (The Computerized Analyst): The program DOCTOR is a version of the old ELIZA program written to run in TECO. It is less powerful than the original LISP program, but requires only a version of TECO to run. It causes the computer to respond to your statements as would (?) a psychoanalyst, and attempts to carry out a conversation with the user.

Note: DOCTOR Game runs with any version of TECO.

Write-up on media.

Media Price Code: A2, M55

Format: DOS-11

**Fast Spectrogram Generation/Display for
PDP-11/VT-11 or VS-60**

Author: L. Robert Morris/M. Pearlman
Carleton University, Ottawa, Ontario, Canada
Operating System: RT-11
Source Language: FORTRAN IV/MACRO-11
Memory Required: 20K

11-361

Abstract: This software package samples audio bandwidth signals (0-4 kHz) and produces either a wide or narrow band spectrogram on a VT-11/VS-60 graphics processor. Other hardware requirements are a 20K PDP-11 with EIS (11/34, 40, 45, 55, 60, 70) and any analog-to-Digital converter. Processing time for a 1.2 seconds for an 11/55. The spectrogram is then immediately viewable in subdued lighting or may be photographed in a darkened room using a time exposure. Superimposed short vectors are used to give a 16 level grey scale.

This package is particularly useful in speech processing, especially for testing new analysis/synthesis algorithms.

Media Price Code: A2, K27

Format: RT-11

MUMPS-11 Library Tape

11-362

Revised: December 1977

Submitted by: Ron Ginger

Digital Equipment Corporation, Maynard, MA

Operating System: MUMPS-11

Abstract: This tape includes the following MUMPS-11 DECUS programs: 11-324, 11-326, 11-330, 11-331, and 11-332.

Media Price Code: M55

Format: MUMPS-11 Compatible

Section 2.2

RSTS-11 ABSTRACTS

RSTS-11-1—RSTS-11-8

EDITOR.BAS (and EDITIN), Version 6A

Revised: 31 July 1973

Author: Walter E. Brown and Mark Williamson
Lawrence University, Appleton, WI
Operating System: RSTS V4A-12

RSTS-11-1

Abstract: EDITOR can be used for resequencing, deleting, extracting, listing (in paged format) and performing other useful editing chores on BASIC-PLUS programs. It was written for use in conversational mode via 64-character ASCII terminals.

Media Price Code: A2, G20

UTILITIES, EDITORS, AND HANGMAN GAME

Author: Clark Baker
Project DELTA, University of Delaware, Newark, DE
Operating System: RSTS V4A-12
Memory Required: 4K

RSTS-11-2

Abstract: EDIT8 will edit BASIC-PLUS programs. It is a character editor which will locate a character, delete characters, change characters, etc. It works only on files with line numbers.

EDIT will edit text files (BASIC-PLUS programs) and do two things: 1) locate any given string, and 2) replace one string with another.

PIP is like DEC's PIP but has different options. Some of these include /M—MACRO and /X—transfer.

FANNY will punch nice fanfold paper tapes on a low speed tape punch. It will punch the name of the program in readable punch at the start of the tape.

HANG will play a game of hangman on a VT06.

Media Price Code: D2, H32

TEXT EDITOR FOR RSTS

Author: William H. Blake
Purdue University, West Lafayette, IN
Operating System: RSTS V4A-12
Memory Required: 8K
Other Software Required: RECORD I-O Option

RSTS-11-3

Abstract: Provides text editing for RSTS. Commands are LIST, INSERT, DELETE, SEARCH, REPLACE, CHANGE, and END. Alternate files may be specified for LIST, SEARCH, INSERT and CHANGE. Variable length lines are allowed up to a maximum of 256 characters. The editor has a maximum capacity of 246,000 characters.

Media Price Code: D2, G8

CREATE and CREAT1

Author: Clark Baker
Project DELTA, University of Delaware, Newark, DE
Operating System: RSTS V4A-12
Memory Required: 4K

RSTS-11-5

Abstract: CREATE makes a virtual matrix called \$PUNCH.MAT which contains enough information to produce the 96 printing characters in 5 × 7 block letters on punch tape, lineprinter, or teletype. CREATE only creates the file; the user must write the programs or use FANNY or CREAT1 (See RSTS11-2).

Providing readable punched paper tapes, CREAT1 is capable of three possible formats; sentence structured, (capitalized first word and period) fully capitalized string, or all lowercase alphabet. CREAT1 will operate with any legal alpha-numeric and space. It will not output control characters, and requires CREAT1.INS for instructions, and PUNCH.MAT (created by CREATE) as the data base.

Media Price Code: D1, G6

RESEQ—Program Resequencing

Revised: 1 January 1974

Author: Clark Baker
Project DELTA, University of Delaware, Newark, DE
Operating System: RSTS-E and RSTS-V4A
Memory Required: 5K

Abstract: RESEQ will resequence any BASIC + program. The user has the option of resequencing the whole program or only certain parts of the program.

Media Price Code: D1, G5

Accounting Package

Author: Staff
Bentley College, Waltham, MA
Operating System: RSTS V4A-12

Abstract: This package is a set of 12 accounting programs designed to illustrate college accounting texts and perform useful calculations. Output format is formal on major subjects. Texts used include: *Intermediate Accounting* by Simons, *Cost Accounting* by Matz/Curry and *Accounting with the Computer* by Wilkenson. Programs included are:

| | |
|---------|---|
| BDAMRT | bond amortization |
| BYFIELD | bond yield |
| BDVAL | mathematical valuation of bonds |
| DEPRE | six methods of depreciation |
| OVHVR | overhead standard variances |
| PRIMEV | material and labor variances |
| PENFUN | pension fund analysis |
| LEASE | lease purchase method of leaseholds |
| CASE1 | dynamic accounting simulation with (includes student interaction 6 files) |
| MXFIB | finds max. of user-defined function over an interval |
| MXTRI | similar to MXFIV, trisection method |
| ROOTS | finds roots of user-supplied function over an interval |

Media Price Code: D6, H32

System Status Display—Hazeltine 2000

Author: R. N. Bialec and K. A. Sheridan
Interactive Information Systems, Cincinnati, OH
Operating System: RSTS V4A-12

Abstract: Provides continuous monitoring of a RSTS System similar to Cusp VT5DPY. The program is written for the Hazeltine 2000 CRT.

Media Price Code: D2, G8

**Project DELTA Educational Package, Section A, RSTS-11-9
Mathematics Programs**

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: 8K

Abstract: Programs included are:

| | |
|--------|---|
| CROUT1 | solves simultaneous linear equations by Crout algorithm |
| SIMEQN | solves simultaneous linear equations |
| CDETER | computes value of complex determinant |
| CALC2 | extended precision calculator |
| FACTOR | finds prime factors of positive integers |
| EUCLID | computes largest common factor of two integers |
| DERIV | derivative of a function at a point |
| SQRS | express an integer as the sum of four squares |
| SPHERE | solves spherical triangles |
| LRGNUM | large number of addition and multiplication |
| FNCTS | computes trig functions for complex arguments |
| SQUARZ | computes square root of a complex number |
| CURFIT | performs least squares fit |
| INTGRT | computes numeric integral of a function |
| ROMINT | integrates a function by Romberg method |
| ROOTER | find roots of polynomials |
| BESSEL | calculates Bessel functions |
| GFFT | fast Fourier transform |
| PLOT | plots a function on user terminal |
| DEQFO | solves first order differential equation |
| DQEFO2 | solves second order differential equation |
| LINFIT | best linear curve fit calculations |

Note: DECtape includes RSTS-11-10.

Media Price Code: D6, H32

**Project DELTA Educational Package, Section B, RSTS-11-10
Statistics Programs**

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: 8K

Abstract: Programs included are:

| | |
|--------|--|
| LNREG1 | Simple linear regression calculations |
| LNREG2 | simple linear regression calculations |
| BINOPO | probability distribution comparisons |
| REGCOR | regression and correlation analysis |
| CHISQ | computes probability of chi-square values |
| CHISQS | chi-square statistics for m × n contingency tables |
| GEOMEN | statistics of geometric distribution |
| PHICOE | phi-coefficient calculations |
| CORMAT | correlation matrix for n series of data |
| ANVAR1 | analysis of variance for a randomized one-way design |
| ANVAR2 | analysis of variance (Latin square design) |
| HISTOG | produces histogram on user terminal |
| RANDEV | generates random deviates |
| STAT1 | produces statistics on two groups of unpaired data |
| STAT2 | Mann-Whitney two sample rank test |
| STAT3 | Spearman rank correlation coefficients |

Note: DECtape includes RSTS-11-9.

Media Price Code: D3, H32

**Project DELTA Educational Package, Section C, RSTS-11-11
Business Programs**

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: 8K

RSTS-11-9

Abstract: Programs included are:

| | |
|--------|--|
| DECSN | management decision simulation for 10 to 60 participants |
| MANAGE | Management decision simulation for 3 teams |
| DYNPRO | dynamic programming model, business simulation |
| DEPCOM | four methods to calculate depreciation |
| ANNUIT | annuity analysis |
| EQUITY | computes cost of equity capital |
| INSTMT | produces income statement |
| LENDER | simple loan analysis |
| TRUINT | true annual interest rate |
| LESSEE | lease analysis compares lease with purchase |
| SALES | prints sales commission report |
| MKBUY | make vs. buy analysis |
| MORGAG | mortgage analysis |
| GNPSUM | gross national product summary |
| EXDRSK | extended risk analysis |
| STKRTN | stock return report |
| STKSMO | exponential smoothing stock guide |
| STKVAL | stock value report |
| STKINC | stock merger incentive |
| BNDPRC | bond price analysis |
| BNDYLD | bond yield analysis |
| BNKRSV | bank reserve calculations |
| CAPINV | capital investment analysis |
| EXSMOO | exponential smoothing on price data |
| BALSHT | balance sheet and income statement |
| INACNT | national income and product accounts |
| INOUT | analysis of inter-industry product flow |
| BUDGET | department manager's budgeting program |

Note: DECtape includes RSTS-11-12.

Media Price Code: E14, H32

**Project DELTA Educational Package, Section D, RSTS-11-12
Electronics and Production Oriented Programs**

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: 8K

Abstract: Programs included are:

| | |
|--------|--|
| ANALAD | ladder network analysis |
| ACNODE | AC circuit analysis |
| LPFLTR | design of low pass filters |
| MICRO | microwave parameter conversion |
| MIXSPR | spurious response identification |
| HTXFT | heat transfer in a thin plate |
| BEMDES | steel beam selection |
| DEBYE | computes Debye or Einstein functions |
| ASGNMT | assignment problem |
| LINPRO | linear programming model |
| LNTRND | linear trend forecasting |
| LQVALV | computes liquid control valve coefficients |
| TMFCEV | time function evaluator |

Note: DECtape includes RSTS-11-11.

Media Price Code: D6, H32

Games, Puzzles and Recreation—1

Author: David H. Ahl

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A-12 or RSTS/E V05-21

RSTS-11-13

Abstract: GAMES, PUZZLES, and RECREATION-1 is a DECtape containing 55 of the most popular RSTS-11 and RSTS/E recreational programs. Many of the programs have substantial educational value,

RSTS-11-13 (Cont.)

especially for learning about principles of mathematics, probability and logic. Programs range from a comprehensive Space War simulation to a nursery stories quiz.

Note: Documentation available from Digital Equipment Corporation (Order Number EB-04873-76.)

Media Price Code: H32

Games, Puzzles and Recreation—2

Author: David H. Ahl

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A-12 or RSTS/E V05-21

Abstract: GAMES, PUZZLES, and RECREATION-2 is a DECTape containing 49 popular RSTS-11 and RSTS/E recreational programs. A number of the programs are unique in concept and have real educational value as well as being interesting and good fun.

Some of the programs take advantage of the advanced features of BASIC-PLUS and are quite elegant in structure as well as being challenging and entertaining to run. Programs range from the games of Yahtzee and Monopoly to a smog simulation to a pizza delivery game.

Note: Documentation available from Digital Equipment Corporation (Order Number EB-04873-76.)

Media Price Code: H32

RSTS-11-14

Abstract: TEXTED is a general purpose on-line text editor capable of making any desired changes in an ASCII file saved on disk.

Media Price Code: D2, G16

GERMAN - Adjective Ending Game and Data

RSTS-11-18

File Editor

Author: Mark Linton

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A

Source Language: BASIC-PLUS

Memory Required: 4K

Abstract: GERMAN is a test on German adjective endings in certain sentences. The user tells the number of sentences he wants. Then for each sentence, an adjective ending is left out of the sentence which the user must replace with correct ending. If he is correct he will proceed to the next question; if not he will be told the correct answer and why it is correct. There are sixty-eight possible sentences to be asked. These are in a data file and GERMAN gets random ones for the user.

GEDIT is a special program for the game, GERMAN, which can change or create the data file used, GERMAN.DAT. The data file used is a virtual array, while the raw data file is not. GEDIT was written to convert the raw data (included in this package) into the virtual array. Also, in the case that there is a mistake of spelling or grammar or new sentences to be entered, this program can perform the necessary changes.

Restrictions: Data file must exist (GERMAN.DAT).

Media Price Code: D2, G10

FAST; ECONMY, ECON2; ONIONS

RSTS-11-19

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: FAST—4K; ECONMY—7K, ECON2—6K; ONIONS—5K

Abstract: FAST teaches the skill of typing in a competitive manner. ECONMY, ECON2 use a model of the U.S. economy to allow the user to control the economy by his decision of government financing.

ONIONS illustrates the cobweb model for supply and demand in the environment of the American onions market.

Media Price Code: D2, G14

LSFORM—LS11 Centronix Line-Printer Driver**RSTS-11-15**

for RSTS V4A

Author: Mark Bramhall and Tim Hart

Submitted by: Paul Goyette

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A-12

Source Language: MACRO-11

Special Hardware Required: Centronix Line Printer—Model 101

Abstract: This program, when incorporated as part of the resource sharing, time-sharing System (RSTS) monitor, makes available to the user the special features of the Centronix Line Printer (DEC designation: LS11)

Media Price Code: D2, F5, G8, H32

TALK—Inter Terminal Communications Program**RSTS-11-16**

Author: Gregory Crim

Wabash College Computer Center, Crawfordsville, IN

Operating System: RSTS V4A-12

Memory Required: 7K

Special Hardware Required: TTYs

Abstract: TALK is a program which allows rapid and direct communication between terminals. It is meant to be used by anyone on the system, although its functions are more powerful if the user is running under a privileged account. Its purpose is to extend the use of the broadcast option, in limited fashion, to all users; it contains special routines which check on the state of the terminal to receive, and will prevent a non-privileged user from sending to a "busy" terminal.

Should be saved under the system library, and protected to 168.

Media Price Code: D2, G8

TEXTED**RSTS-11-17**

Author: Andrew W. Riebs

Submitted by: Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12

Memory Required: 8K

Special Hardware Required: Any USASCII 64-character device

TREK—Star Trek Game

RSTS-11-20

Revised: 24 October 1974

Author: Aron K. Insinga

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A-12

Memory Required: 8K

Abstract: This is a game based on the "Star Trek" television show. The user is placed in command of the starship Enterprise and attempts to destroy the Klingon invasion force.

A new game is generated with each run.

Media Price Code: D2, G8

ROBOT and FIX

RSTS-11-21

Author: Mark Linton

Project DELTA, University of Delaware, Newark, Delaware

Operating System: RSTS V4A-12

Memory Required: 4K

Abstract: ROBOT is a game simulating finite state automata by enabling the user to control and change the robot's personality and mood

RSTS-11-21 (Cont.)

by input of different treatments or input of an expected reaction and mood.

FIX can change or create the data file used by ROBOT.

Media Price Code: D2, G5

TUTR - BASIC Tutoring Programs

Submitted by: Mary L. Cole

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS/E

Memory Required: About 6K

RSTS-11-22

Abstract: This package of programs will tutor the user in the elements of the BASIC language and RSTS-11 commands. The programs are self-documenting. To use them load all programs from the DECTape onto the system disk and run TUTR01. From that point on, the programs will tell the user what to do and which programs to run next.

Note: Programs are self-documenting. TUTR01 through TUTR17 are included.

Media Price Code: H32

NAMES and CEMGEN, Computerized Question Generation

Author: M. L. Cole

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A-12

Memory Required: 8K

Abstract: This package consists of two programs: NAMES and CEMGEN. The programs are designed to serve as an example of the type of operation particularly well-suited to a computer.

CEMGEN produces ten questions dealing with the weight and number of atoms in samples of elements and exercises in balancing equations. The questions themselves can easily be replaced with other questions from any subject area dealing with mostly numeric answers. CEMGEN takes a standard format question, generates random numbers for the given numeric values, thereby customizing each test, quiz, or homework assignment. CEMGEN then proceeds to output the test and an answer key.

If the NAMES program is used to create a file of student names, CEMGEN will produce a different test for each student in the name file (with a form feed between tests). It will also produce a keyed answer sheet with answers to each question noted for each student. The answer sheet is produced student-by-student. If NAMES is not used, CEMGEN will produce one test and answer sheet, then ask if another is to be created.

Media Price Code: D2, G8

BPDEMO—Additional BASIC-PLUS Demos for the PDP-11

Author: Patrick M. Donini

Goodyear Atomic Corporation, Piketon, OH

Operating System: RSTS V4A-12

Memory Required: 45 blocks of DECTape or RK11 storage

Special Hardware Required: LP-11 (optional), TTY, High Speed Punch (optional)

Abstract: A group of five BASIC-PLUS programs which can be used for demonstration or entertainment.

Four of the programs allow the user direct participation in the run.

Included are: BUNNY, YOUR PICTURE AS SEEN BY THE COMPUTER, BLACK JACK '73', CHUCK-A-LUCK, CHINESE REMAINDER THEORM.

Some knowledge of the games is helpful but not necessary. All programs have some explanations and directions built into them.

Media Price Code: G16

BRAVO

Author: Jeffrey Robbins

Northfield Mt. Hermon, Northfield, MA

Operating System: RSTS V4A-12

RSTS-11-25

Abstract: BRAVO is a language program which will quiz the user about vocabulary usage in a specified language, tell whether the selected answer is right or wrong and, if wrong, give the correct answer. This version is for the Spanish language but instructions are given for conversion to other languages.

Media Price Code: D2

ROTATE, POLY, PLOT10, XYPILOT**RSTS-11-26**

Author: Students

Northfield Mt. Hermon School, Northfield, MA

Operating System: RSTS V4A-12

Abstract: ROTATE—eliminates the 'xy' term from the general quadratic equation $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ by counter-clockwise rotation of the coordinate axes by angle theta.

POLY—deals with polynomials. It contains routines for defining a polynomial, inverting, integral, derivative, evaluation and fitting an equation to a set of points.

PLOT10—will plot up to 10 functions

XYPILOT—will plot a function with the Y axis horizontally and the X axis vertically.

Media Price Code: D2, G10

GENES**RSTS-11-27**

Author: Jeffrey Robbins

Northfield Mt. Herman School, Northfield, MA

Operating System: RSTS V4A-12

Abstract: GENES is a biology program designed to do simple genetic calculations using the Punnet square method. Given the total population and the number of homozygous recessives contained, GENES finds the dominants and the other parts for the Punnet squares.

Media Price Code: D1

Line Editor for RSTS-BASIC (MODIFY)**RSTS-11-28**

Author: John R. Kelsoe

V. A. Hospital, Birmingham, AL

Operating System: RSTS V4A-12

Abstract: MODIFY will change specific parts of .BAS files or string files given a search string and a string to replace that search string. String modifications can be done in all of a source program or only in specific line numbers.

Media Price Code: D2, G5

EDIT**RSTS-11-29**

Author: Ir A. Hemelaar

Prins Mauritslaboratories TNO, Rijswijk, The Netherlands

Operating System: RSTS V4A-12

Memory Required: 6K

Abstract: EDIT is a general purpose text editing program. It can be used to prepare and modify text or program files. The command structure of EDIT is compatible with that of the DOS-11 Editor. Much attention is paid to the error recovery. Almost any error can be recovered without loosing the contents of the text buffer.

Media Price Code: D2, G8

COSAP—Conversationally Oriented Statistical Analysis Package*Author:* Mark Williamson*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12 (2 word math package)*Memory Required:* 8K*Special Hardware Required:* At least 1000 blocks of mass storage (One RK05)

Abstract: COSAP is an integrated system of over two dozen programs, which used most of the features (virtual core, matrix, facilities, etc.) of BASIC-PLUS.

COSAP will perform twelve different statistical analyses: elementary statistics, histogram construction, Student's tests, rank correlation, multiple Pearsonian product-moment correlation, simple regression, multiple regression, polynomial regression, step-wise regression, discriminant analysis, factor analysis, and probit analysis.

COSAP also includes a uniform format for data input and storage for all analyses, the ability to save input data on disk for later analyses, storage for descriptive DATABANK and variable labels, comprehensive data editing and transformation routines, and conversational "help" messages to assist the user who is uncertain of the input requirements for an analysis.

*Documentation on Media.**Media Price Code:* E12, H32**RSTS-11-30****PAYROLL, Idaho Falls Payroll System***Author:* John Christensen

Idaho Falls School District, Idaho Falls, ID

Operating System: RSTS-11*Source Language:* BASIC-PLUS*Memory Required:* 28K*Special Hardware Required:* Card reader, line printer, DECtape, cartridge disks

Abstract: The payroll package implemented by the Idaho Falls School System is part of a fully accrued and encumbered system of accounting. The package handles three types of employee payments: contract payments, time card payments, and payments for employees who earn a fixed amount per day.

The entire package includes master personnel file maintenance, payroll and deduction calculation, check-writing, payroll journal, deduction registers, and automatic entry to the general ledger system.

Restrictions: Users payroll requirements must resemble those of Idaho Falls implementation

Note: Card layouts, disk file layouts, sample output and program descriptions are offered with listing

Media Price Code: A8, B16, H64**RSTS-11-33****INRAN, OUTRAN—Computerized Question Generation #2****RSTS-11-31***Author:* M. L. Cole

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A-12*Source Language:* BASIC-PLUS

Abstract: This package allows an instructor to generate tests with any number of questions chosen of random from a data base containing a large number of questions. For example, a data base of 50 questions could be created and each test could be made to consist of 20 questions chosen at random from among the 50. Tests and answer keys are printed separately. The programs can be told to create a given number of tests or (using the NAMES program from RSTS11-23 or PIP) a student name file can be created and the tests and answer keys will be printed according to the student names in the file.

Media Price Code: D2, G8**EDIT8****RSTS-11-32***Author:* Clark Baker

Project DELTA, University of Delaware, Newark, Delaware

Operating System: RSTS/E and RSTS V4A*Source Language:* BASIC-PLUS*Memory Required:* 7K

Abstract: EDIT8 is an editor written after the edit command on Edu-system 20. It will edit any BASIC-PLUS program on a line-by-line basis.

This program is a revised version of the edit program available in RSTS11-2.

Media Price Code: D1, G8**Wabash College Student Information System****RSTS-11-34***Author:* James Warden

Wabash College, Crawfordsville, IN

Submitted by: Alice Peters

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS V4A*Source Language:* BASIC-PLUS*Memory Required:* 28K*Special Hardware Required:* Card Reader, line printer, DECtape, disk

Abstract: Wabash College has implemented all their non-financial data processing on their RSTS system in BASIC-PLUS. The main categories of data processing handled by the system include student registration, grade reporting, alumni and applicant record-keeping and reporting, and many types of mailings. Most file updating is done directly by the secretarial staff of the responsible office with a remote terminal. This affords each office served the opportunity to maintain protection for those files and reduces staff requirements at the Computer Center.

*Documentation on Media.**Media Price Code:* A2, E20, P85**COMSYS—RSTS-11 Communications System****RSTS-11-35***Author:* Jeffrey J. Killeen

Assumption College, Worcester, MA

Operating System: RSTS-11 V4A-12*Source Language:* BASIC-PLUS*Other Software Required:* RECORD I/O Option*Special Hardware Required:* DL-11B, DC-11 (EIA RS232C Serial Line Interface)

Abstract: There are two programs in this system. One handles the input from the remote system and displays it on a terminal on site. The other is the control program which takes input from the on-site terminal and sends it to the remote system. The control program also controls the input program and selects the mode of operation.

There are two modes of operation. One allows the terminal on site to act as a terminal to the remote system. The second mode allows the user to transfer files from the remote system to a file on-site. While the transfer of a file is taking place the data is displayed on the on-site terminal.

Restrictions: Programs cannot be run under V05-21 RSTS/E*Media Price Code:* D2, G8

READID.MAC*Author:* Paul Koning*Submitted by:* Michael Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12 or DOS V004A*Source Language:* PAL-11*Memory Required:* 28K 16-bit words

Abstract: This program reads the ID of any RK05 disk pack. It is useful if the physical label on the outside of the pack becomes lost or unreadable and allows you to know the ID of a pack in order to mount it.

Media Price Code: D2, G8**SPRING THING***Author:* Clark M. Baker

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS/E or RSTS-V4A*Source Language:* BASIC-PLUS*Memory Required:* 6K

Abstract: This program simulates the action of waves on a coil spring. Copies of four runs and a description of program operation are included with the documentation.

Media Price Code: D2, G5**Analog Computer Simulator***Author:* Clark Baker

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS/E or RSTS V4A*Source Language:* BASIC-PLUS*Memory Required:* 8K

Abstract: Simulates an AMF 665/D analog computer. It has a constant, three adders which also act as scales, two integrators and a meter.

Media Price Code: D2, G5**YACHT—Yachting Championship Results***Author:* Graham Cock

Weapons Research Establishment, Salisbury, South Australia

Submitted by: Max Burnett

Digital Equipment Australia

Operating System: RSTS V4-12*Source Language:* BASIC-PLUS*Memory Required:* 8K User area

Abstract: Used for scoring the World O. K. Dinghy Yachting Championship held in Adelaide, Australia in 1974, this program could easily be adapted to any other yachting event involving a single class of boat. It is designed to be operated from a terminal connected by land line to a RSTS BASIC-PLUS configuration.

Restrictions: Needs disk space for virtual arrays*Media Price Code:* D2**Management Case Studies***Author:* Darryl Johnson

Bentley College, Waltham, MA

Submitted by: Mary L. Cole

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS-11 and RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 8K user area**RSTS-11-36**

Abstract: This package is a set of 12 BASIC-PLUS programs for use on a PDP-11 RSTS timesharing system. Together the programs illustrate business management operations. The programs are based on examples from the book: *Computer Augmented Cases In Operations and Logistics Management* by William L. Berry and D. Clay Whyback, published by South-Western Publishing Company, Cincinnati, Ohio. Programs included simulate the operations of seven different companies.

*Documentation on Media.**Media Price Code:* D3, H32**RSTS-11-41****TYPIST***Author:* Bentley College

Waltham, MA

Submitted by: Mary L. Cole

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS-11 and RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 8K user area

Abstract: This system is composed of a series of programs designed to emulate the 'TYPIST' program from Dartmouth College. TYPIST takes an input file of ASCII text and realigns typed lines where necessary. Output from TYPIST can be edited and used as input to TYPIST.

*Documentation on Media.**Media Price Code:* A2, H32**RSTS-11-42****MIS—Management Information System***Author:* Clark Baker

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS/E or RSTS-V4A*Source Language:* BASIC-PLUS*Memory Required:* 11K (may be made smaller)

Abstract: MIS will take a file of fixed length records and produce another file of fixed length records which is the first with subsets and/or sorts.

Media Price Code: D2, G8**RSTS-11-43****Elementary Instructional Programs, Volume I***Revised:* 9 January 1975*Author:* Robert A. Huntsman*Submitted by:* John Christensen

Idaho Falls School District, Idaho Falls, ID

Operating System: RSTS-11*Source Language:* BASIC-PLUS*Memory Required:* 28K minimum

Abstract: This series of 18 instructional programs is designed as supplemental instructional materials for elementary school reading and math curricula, but additionally can be used for remedial or review work for older age groups. The programs provide drills on addition, subtraction, multiplication and division in the math department and spelling word games and phonics in the reading department. One outstanding advantage of these drills is that students find out immediately, before they go on to the next problem, how well they performed and are given appropriate congratulatory messages or helpful hints for solution. The difficulty of the problems is automatically updated to the present students' performance.

Although the programs do not maintain records of student performance for later teacher analysis, the programs do type out the student's score, number of problems tried, number correct, and percentage correct at the end of each program session.

*Documentation on Media.**Media Price Code:* D8, H32

Fractions Drill and Practice*Revised: 9 January 1975 (tape only)**Author: Robert Huntsman**Submitted by: John Christensen**Idaho Falls School District, Idaho Falls, ID**Operating System: RSTS-11**Source Language: BASIC-PLUS**Memory Required: 28K minimum*

Abstract: This series of 12 instructional programs is designed as supplemental instructional materials for junior high and high school mathematics curricula, but additionally can be used for remedial or review work for older age groups. The program provides drill and practice in fractions: adding, subtracting, multiplying and dividing fractions with common and different denominators, and concepts of greatest common factors, reducing fractions, least common multiples, improper fractions, inverses and reciprocals. The problem difficulty is automatically updated with respect to the student's performance. However, the student may not go on to the next program in the series unless he successfully completes some more difficult problem. After each student answers, the program provides a congratulatory message or a helpful hint. The programs do not maintain record files but do print out student scores at the end of each session.

A complete documentation of the package and program listing can be printed on a printer by running from DECTape the program—PRINT—using the RSTS monitor.

*Documentation on Media.**Media Price Code: D8, H32***Dartmouth Statistics Programs****RSTS-11-45***Author: Al Higgins**Northfield-Mt. Hermon School, Northfield, MA**Submitted by: Mary L. Cole**Digital Equipment Corporation Maynard, MA**Operating System: RSTS V4A or RSTS/E**Source Language: BASIC-PLUS**Memory Required: Less than 8K*

Abstract: This is a package of 39 programs developed and in use at Dartmouth College. The programs have been converted from the PDP-10 to RSTS-11 BASIC. The programs are quite self explanatory and are useful by themselves or as routines for inclusion in larger BASIC programs. Documentation for each program includes the program listing and then a run of the program. An explanation of the algorithm or theory behind the program can usually be found in comments at the very beginning of each program.

*Media Price Code: D7, H32***North Country Union High School Administrative Programs****RSTS-11-46***Author: John Miller and Steve Ketchum**North Country Union High School, Newport, VT**Submitted by: Alice Peters**Digital Equipment Corporation, Maynard, MA**Operating System: RSTS V4A**Source Language: BASIC-PLUS**Memory Required: 28K*

Special Hardware Required: Card reader, line printer, DECTape, disk

Abstract: This package contains both financial and student accounting systems. The financial system includes accounts payable, expense ledger, and payroll; the student administrative system includes attendance accounting, grade reporting, and transcripts. The software runs on a PDP-11/20 with DECTape and RF/RS 11 disk, uses card input for all subsystems and an 80-column printer for output.

RSTS-11-44

The programs are on two DECTapes, but may be ordered separately, if desired. If you want only the financial programs, request tape A. Request tape B to receive the student administrative programs separately. Write-up contains documentation for both tapes.

*Media Price Code: D12, H64***Project DELTA Educational Package, Section E RSTS-11-47****Additional Mathematics Programs and Section F Teacher Assistance Programs***Author: Staff**Project DELTA, University of Delaware, Newark, DE**Operating System: RSTS V4A and RSTS/E**Source Language: BASIC-PLUS**Memory Required: Mostly under 8K**Abstract: Programs included are:**Section E, Additional Mathematics Programs*

| | |
|--------|---|
| GLPSA1 | two phase simplex method of linear programming |
| TMFCEV | time function evaluation (engineering applications) |
| CALC | calculator for numbers of up to 100 digits |
| CXEXP | raise a complex number to a real or complex power |
| GSIMEQ | solves simultaneous linear equations |
| CXARTH | performs vector arithmetic operations |
| POLY | finds polynomial to approximate a table of x-y data |
| POLFIT | performs multiple regression/correlation analysis |
| FREQ | finds number of data points (frequency) within limits; data can be in a file or from terminal |
| RANDOM | generates random numbers with user-specified sample and population sizes |
| ANVAR3 | computes analysis of variance table for a 2-way classification of variables design in which a single observation is made for each combination of levels |
| ANVAR4 | computes analysis of variance table for a 2-way classification of variables factorial design with replicated observations |
| GANOVA | computes analysis of variance table for a 2-way classification of variables; data is entered down columns |
| MULTX | performs a least squares curve fit to one of seven functions; operation is interactive at the terminal |
| POLSUB | exercises students in polynomial subtraction operations |
| GINTLP | solves linear programming problems with variables of values 1 and 0 |
| SIPRAC | exercises students in mathematical operations on signed numbers |
| KR20 | item analysis and Kuder-Richardson formula 20 |
| DE10R | solves a first order differential equation (Runge-Kutta) |
| DE20R | solves second order differential equation (Runge-Kutta) |
| SUNSET | computes Greenwich Mean Time (or other time) for sunrise and sunset given a particular week and a given latitude and longitude |
| WAVES | plots effects of changing wavelength, amplitude and phase on two waves and their sum |
| SPCTRA | plots optical absorption spectra of two species equilibrium mixtures |
| FACTRL | produces any desired factorial and preceding factorials |
| SQRZ | finds the square root of a complex number |
| BISQAR | drill for students on squaring binomials |

Section F, Teacher Assistance Programs

| | |
|--------|--|
| AVERG1 | averages and curves grades |
| GRADE | given the number of questions on a test, prints list of percent score vs. number of questions right or wrong |
| STAT | performs statistical analysis of student grades |
| SCORES | computes mean, standard deviation, and standard scores for student grades |

Media Price Code: E10, H32

Project DELTA Educational Package, Section G RSTS-11-48

Business Programs and Section H Data Processing Programs

Author: Staff

Project DELTA, University of Delaware, Newark, DE

Operating System: RSTS V4A or RSTS/E

Source Language: BASIC-PLUS

Memory Required: Mostly under 8K

Abstract: Programs included are:

Section G, Business Programs

| | |
|------------------|--|
| GSSS | small system simulator, allows an item to be created, moved through a defined system, then be destroyed |
| CSHFLO | performs up to four cash flow analyses for given cost of capital; computes rate of return and payback period |
| GNMRVB/ GMRGB | securities portfolio analysis (I and II) |
| GSTKVL | stock valuation |
| GTEIOR | securities EPS growth |
| TRCK1 | calculates breakpoint weights for trucking freight |
| LEASIN | calculates lease income |
| LOAN | loan amortization |
| GIRRIV | investment return (cash flow) |
| GRISKA | analysis of risk in capital investment |
| IATA1 | calculates breakpoint weights for air freight |
| DROIPB | discounted return on investment |
| GKASSF | computes normal price of a warrant |
| GKCOST | price/earnings ratio calculations |
| GVOTE | simulates committee votes |
| C PATH | critical path analysis |
| GCPM1 | critical path analysis |
| GCPATH | critical path analysis |
| SLSSMN | sales management program |
| INSTR.UCS | instructions data file for SLSSMN |
| LABOR | labor/management bargaining simulation |
| LABSET | creates data file for LABOR |
| LABOR.DOC | description of LABOR program |
| MARKOW | computes efficient securities portfolios |
| GNPSUM | produces figures for GNP, consumption, investment, and government spending from a model where consumption is a function of income in the previous period |
| WHEELS | program simulates finances of owning and operating a car over twelve months |

Section H, Data Processing Programs

| | |
|--------|---|
| STOPB | simulates a simple digital computer with a defined machine language |
| BRAIN | simulates a simple digital computer with a defined machine language more complex than STOPB |
| ADDRES | prints addresses on labels |
| SORT | performs ascending or descending sort on simple ASCII file |
| XREF | BASIC program listing and cross reference generator |

Documentation on Media.

Media Price Code: E14, H32

SADSM

Author: Dennis Washa

University of Wisconsin, Platteville, WI

Source Language: BASIC-PLUS

Memory Required: 6K

Special Hardware Required: PDP-11/40

Abstract: This program emulates the language 'SADSM'. It is a good tool for instructing beginning students in Computer Science. The program itself is a minisystem which, in itself, would be a good tool for more advanced students in looking at a system.

Media Price Code: D2, G14

RSTS-11-49**MIGIT**

Author: Dennis Washa

University of Wisconsin, Platteville, WI

Source Language: BASIC-PLUS

Memory Required: 8K

Special Hardware Required: PDP-11/40

RSTS-11-50

Abstract: MIGIT is a symbolic language developed to aid a beginning programmer in the understanding of an assembly language. MIGIT is the counterpart of the machine language called SADSM which was developed in an earlier program. The opcodes in both SADSM and MIGIT are compatible, that is, the coding of MIGIT is translated into SADSM, and all SADSM coding can be easily converted to MIGIT. An assumption is therefore made that the MIGIT programmer has programmed in SADSM.

Media Price Code: D2, G16

ACCMAT—Account Maintenance File

Author: Lawrence A. Dziegielewski

Project DELTA, Newark, DE

Source Language: BASIC-PLUS

Memory Required: 4K

RSTS-11-51

Abstract: This BASIC-PLUS program allows the user to perform transfer, deletion, listing, renames, and protection changing by using only one program 'ACCMAT' instead of using CAT and PIP. When the file is printed out, you need not look up block sizes and protections, because it prints them out with the file name. Any of the above mentioned options can be performed on the file, making it faster than either CAT or PIP.

Media Price Code: D2, G5

Fiscal Accounting

Author: John Christensen

Idaho Falls School District, Idaho Falls, ID

Memory Required: 28K

Special Hardware Required: Line Printer, Card Reader, at least 3 RK05 Disk Drives.

RSTS-11-52

Abstract: The Fiscal Accounting Package, a fully accrued and encumbered system of accounting, consists of two subsystems, accounts payable and general ledger reporting. The accounts payable package (A.P.) includes the normal accounts payable functions; the general ledger package (G.L.) includes the printing of the general ledger and various forms of budget and expenditure reports.

The Fiscal Package is for the most part a conversion of a similar package developed for an IBM 1401. It is therefore card input oriented. However, that is the only use of cards; the input programs could easily be modified for terminal input. All sorting and data manipulation is done on the disks and output is either to the disks or the line printer. The equipment necessary for the cards is a keypunch and a punched card reader for the PDP-11. The entire package is written in the RSTS V4A-12 BASIC-PLUS language.

A third package can be used in conjunction with the A.P. and G.L. packages. That package is a Payroll Package (also available from DECUS as number RSTS11-33) based on the same system of accounting. The entire system is based on double entry bookkeeping. The A.P. and G.L. package, however, stand alone without the payroll package.

The accounting system is based on a 16 digit general ledger account number. The account number contains, in a more concise form, most of the information recommended by the Federal Handbook II for school fiscal accounting.

Note: One DECTape is documentation

Documentation on Media.

Media Price Code: A7, B10, H64

Computer Dating*Author:* David Corbishley

106 Sorrel Drive, Surrey Park, Wilmington, DE

RSTS-11-53

Abstract: A computer game which, using and coding information from a questionnaire supplied with the program, compares compatibility of males and females participating. Selective printing of the results and the ability to use any RSTS device are features of the program.

Media Price Code: D2, G5**TAPFOR.MAC***Author:* Paul Koning and Mark Williamson*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: DOS/BATCH V004A or RSTS V4A-12*Source Language:* PAL-11 (MACRO) (Does not use monitor)*Memory Required:* 28K 16-bit words on a PDP-11/20 or 11/35*Special Hardware Required:* Console terminal, DECTape drives*Special Hardware Required:* Line Printer, Card Reader, at least 3 RK05 disk drives**RSTS-11-54**

Abstract: TAPFOR is a program for formatting DECTapes in the standard format for the PDP-11. It was adapted from the standard DEC formatting program, DEC-11-YPTA-PB (8/1/70), so that it can be stored on the RSTS CIL and loaded by the RSTS initializing routines, in the same way as ROLLIN or DSKINT.

Media Price Code: D2, H32**XREF.BAS***Author:* Paul Koning*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12 (or RSTS/E)*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on 11/20**RSTS-11-55**

Abstract: XREF prepares a cross-reference table for a BASIC-PLUS program; that is, it prints out a table that shows each line that occurs in the program and the line numbers of the lines that refer to that line with a GO TO, a RESUME, etc.

Media Price Code: D2, H32**The Timer Package***Author:* G. Paul Koning*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on PDP-11/20 or 35**RSTS-11-56**

Abstract: TIMER records terminal usage, number of jobs (detached and non-detached), and benchmark disk I/O every 10 minutes; it also records current date and time every 30 seconds, and thus determines system downtime. TIMOUT, a program in the TIMER package, prints out this information.

Media Price Code: D2, H32**PACK.BAS***Author:* Paul Koning*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on PDP-11/20 or 35*Special Hardware Required:* Console terminal, two or more RK05 disk drives**RSTS-11-57**

Abstract: This program reads the contents of an RK05 disk, file by file, and outputs a RK05 disk pack containing all files read. The output disk is "packed"; that is, it contains no waste space, it has a clean directory, etc. As a result, the output disk will operate more efficiently under RSTS-11.

Media Price Code: D2, H32**MOVERX.BAS****RSTS-11-58***Author:* Mark Williamson*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12 (or RSTS/E)*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on PDP-11/20

Abstract: MOVERX is a general purpose file mover and peripheral interchange program for use by privileged (1,x) and non-privileged accounts. It performs DECTape-to-DECTape, DECTape-to-disk, disk-to-DECTape, and disk-to-disk transfers of any kind of files (including virtual core files and, for privileged users only, .BAC files).

Media Price Code: D2, H32**LISTAL.BAS****RSTS-11-59***Author:* Paul Koning*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A-12 (or RSTS/E)*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on PDP-11/20

Abstract: LISTAL.BAS is a program for listing one or more files in page format. On request, it will list all files, or all except specified files, in a specified account on a specified device (up to 100 files maximum can be specified, although more than that can be listed).

Media Price Code: D2, H32**PUNCH.BAS****RSTS-11-60***Author:* Steve Holmgren*Submitted by:* Michael A. Hall

Lawrence University, Appleton, WI

Operating System: RSTS V4A (or RSTS/E)*Source Language:* BASIC-PLUS*Memory Required:* 28K 16-bit words on PDP-11/20*Special Hardware Required:* ASR 33 or other paper tape terminal

Abstract: PUNCH punches paper tapes on ASR 33 teletypes. Included on the tape are a leader of nulls, an arrow showing direction of tape motion, the name of the file in readable format, and a series of rubouts to indicate the beginning of machine readable information. PUNCH also edits out LFs after CRs.

Media Price Code: D2, H32

HELPER—Editing and Renumbering BASIC-PLUS Programs*Revised:* June 1975*Author:* Eliezer Naddor and Rainer von Saleski*Johns Hopkins University, Baltimore, MD**Operating System:* RSTS/E V05B or V05C*Source Language:* BASIC-PLUS*Memory Required:* 10K User area

Abstract: Program HELPER provides a means for editing BASIC-PLUS programs or formatted ASCII files. It can also be used to renumber any or all line numbers in a program or in a file with line numbers. Thirteen different commands are available for editing and renumbering, including commands for finding and changing of strings; adding, checking, listing or deleting lines; and several options for renumbering.

HELPER also provides certain general services for which ten different commands are available. The services include punching, naming, and cataloging programs and files; accepting messages; and providing numerous illustrative examples of all commands.

The design and documentation allow relatively easy modifications of the existing commands and addition of new ones.

Media Price Code: D6, G30**Bentley Variety Package***Author:* Ross Kass, Darryl Johnson, et al*Bentley College, Waltham, MA**Operating System:* RSTS*Source Language:* BASIC-PLUS*Memory Required:* Not more than 8K

Abstract: This package contains a variety of routines. Among the subjects included are: Accounting, Games, Government, Management (including two critical path routines), Mathematics, Physics, Science, Statistics, and Utilities.

*Documentation on Media.**Media Price Code:* A7, H32**RSTS-11-62****NORTON—Astronomical Ephemeris Program Package***Author:* Warren A. Leach*Submitted by:* Hartwell "Rusty" Whitney*OMSI Community Research Center, Portland, OR**Source Language:* BASIC-PLUS*Memory Required:* 8K

Abstract: NORTON is a RSTS BASIC-PLUS package which gives planet and asteroid positions for any date from January 1, 1900. It will run under RSTS Versions 4 or 5 (8K Job Max). Key phrases are astronomy, planetary position calculator, word processing and solar system simulation.

Restrictions: No graphics Programs Provided*Media Price Code:* D2, G32, H32**RSTS-11-63****NMRSIM—Nuclear Magnetic Resonance Simulation and Plotting Program***Author:* James S. Evans*Lawrence University, Appleton, WI**Operating System:* RSTS V4A-12, 05-21, 05B-24*Source Language:* BASIC-PLUS*Memory Required:* 8K user area**RSTS-11-64**

Abstract: Especially designed for a timesharing environment, NMRSIM simulates nmr spectra using hypothesized values of coupling constants, chemical shifts, rf power, and relaxation times. Fifteen operational modules in three source program segments interact dynamically, requesting parameters in a natural order, computing and plotting spectra for up to six spin-1/2 nuclei or fewer with larger spins, permitting revisions of parameters with minimal repetition, and protecting against erroneous keyboard entries. Line spectrum files can be computed at any terminal and stored on disk for later plotting with the program. The plotting subroutines, which give full control over scaling of the plot with only four input numbers, support the Tektronix 4010 graphics terminal, the TSP-12 or TSP-212 plotting systems, and the Hewlett-Packard 7200A/7202A graphic plotters. Note: DECUS NO. 10-221 is a similar program in FORTRAN.

Media Price Code: D3, H32**SPPLT—Hybrid Orbital Contour Plotting Program****RSTS-11-65***Author:* Stephen L. Holmgren*Submitted by:* James S. Evans*Lawrence University, Appleton, WI**Operating System:* RSTS V05-21, V05B-24*Source Language:* BASIC-PLUS*Memory Required:* 8K user area

Abstract: Especially designed for a timesharing environment, SPPLT prepares accurate contour plots of hybrid atomic orbitals with specified contour levels, effective nuclear charge, amounts of 2s and 2 p character, and geometric operations (scaling, translation, rotation). After plotting, the user can replot the same orbital with different scaling parameters, or perform calculations for a different orbital shape. The program's operational modules are contained in two source program segments with automatic chaining. The plotting subroutines support the Tektronix 4010 graphics terminal, the TSP-12 or TSP-212 plotting systems, and the Hewlett-Packard 7200A/7202A graphic plotters. Note: DECUS NO. 10-212A&B is an equivalent program written in PDP-10 BASIC, Version 17.

Media Price Code: D2, H32**Elementary Instructional Programs, Volume II****RSTS-11-66***Author:* Robert A. Huntsman*Submitted by:* John A. Christensen*Idaho Falls School District No. 91, Idaho Falls, ID**Source Language:* BASIC-PLUS*Memory Required:* 28K

Abstract: This series of 10 programs is designed to supplement the elementary or junior high instruction program. They also can be used for remedial work in high school. The programs not only drill the student in number facts for all four operations, but some of the programs drill the student on problems such as: [] × 6 = 48. What is []? The unique thing about this package is that the programs are timed. The object is to do as many of a given type of problems as can be done in the given amount of time. The student who does the most sets the record. Each time the program is run the record holder's name is printed with his record and the student then tries to beat that record so he can be recorded as the record holder. This feature is optional.

A complete documentation of the package and program listings can be printed on a printer by running from the DECTape the program 'PRINT' under the RSTS monitor.

*Documentation on Media.**Media Price Code:* H32

HPPLOT.BAS—Hewlett-Packard 7202A**Graphic Plotter Programs***Author:* Richard T. Witek

Aurora College, Aurora, IL

Operating System: RSTS V4A-12*Source Language:* BASIC-PLUS*Memory Required:* 7K*Special Hardware Required:* PDP-11, Disk Drive, Hewlett-Packard 7202A Graphic Plotter**RSTS-11-67**

One model has been added to the original six and a backup file has been incorporated for results so that the user may work on a CRT. There are two categories of programs: the models, which are used by students in simulated laboratory exercises, and the maintenance programs, which allow the instructor to construct and alter models.

Restrictions: Requires two accounts*Media Price Code:* A8, H32

Abstract: HPPLOT and the set of programs that go with it are written to be used with a HP-7202A plotter. The set of programs will plot data or functions. The user sets the minimum and maximum for X and Y. The user also may label the X, and/or Y axis plus put a title on the graph.

*Documentation on Media.**Media Price Code:* A2, H32**SOLVE—Southeastern On-Line Version of Enrollment****RSTS-11-68***Author:* Robert A. Branton, Jr.

Southeastern Oklahoma State University, Durant, OK

Source Language: BASIC-PLUS

Abstract: SOLVE is an on-line enrollment and student accounting program for colleges. Some of its features include: on-line reservation type enrollment from multiple terminals, on-line access and modification capability for student records, and the printing of needed reports such as enrollment tallies, class rolls, student lists, report cards, grade labels and honor rolls. SOLVE can be tailored to any size college enrollment.

Restrictions: Assumes PRINT using and RECORD I/O options of RSTS*Media Price Code:* A9, H32**INVSIM—Inventory Simulations****RSTS-11-69***Author:* Eliezer Naddor

The Johns Hopkins University, Baltimore, MD

Source Language: BASIC-PLUS*Memory Required:* 8K*Special Hardware Required:* PDP-11/45, RSTS

Abstract: INVSIM simulates inventory systems in a time-sharing environment. Its options include heuristic rules for guiding the selection of decision variables, simulation of TZ, SQ and SZ inventory policies, and the ability to find the sensitivity of costs and availability to unit costs, leadtime, demands, randomness and various decisions.

Media Price Code: D2, G6**WRIST—Wabash Research Investigation Simulation Teacher****RSTS-11-70***Revised:* August 1975*Author:* Philip F. Spelt and James A. Warden
Wabash College, Crawfordsville, IN*Operating System:* RSTS V4A or RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 9K per user or 2-word floating point and 8K user*Other Software Required:* PIP or BACKUP (RSTS Cusps)*Special Hardware Required:* DECtape

Abstract: This program package, which simulates an assortment of psychology experiments, has been translated into BASIC-PLUS from the Louisville Experiment Simulation System (LESS) by Arthur O. Cromer, et al.

Matrix Software Company Game and Demo Package**RSTS-11-71***Author:* Charles R. Gehman

Matrix Software Company, Beverly Hills, CA

Operating System: RSTS/E V05 or later*Source Language:* BASIC-PLUS

Abstract: Three games and four demos used to demonstrate many of the features of RSTS-11. ACEDU.BAS plays a rather strange version of Aceyducey; CLEAN.BAS types an informative and threatening message on terminals; DIAMND.BAS creates a diamond pattern on the TTY; DIRECT.BAS demonstrates use of certain sysfunctions; FLY.BAS computerized fly-swatte; GUNNER.BAS destroys the enemy; VT05.BAS teaches 'DIRECT CURSOR' control.

Media Price Code: D2**1401 Simulator (RSTS Version)****RSTS-11-72***Author:* Edward R. Giegler*Submitted by:* Carl F. Henry

Carleton College, Northfield, MN

Operating System: RSTS/E V5B24*Source Language:* PAL-11*Special Hardware Required:* PDP-11/40 or 11/45

Abstract: The 1401 Simulator (S1401) runs 1401 programs on the PDP-11 RSTS system. It requires 18K of memory in addition to the requirements of RSTS and BASIC-PLUS. Of this 18K, 6K is used by the S1401 "Run-Time System," and the other 12K is "user area." When multiple S1401 jobs are running "Run-Time-System" is shared by all jobs. The "user-areas" are swapped in and out by RSTS, but the "Run-Time-System" remains in memory as long as any RSTS job is using it.

Media Price Code: A5, H64**SYSELF—System Status—Self****RSTS-11-74***Author:* Charles R. Gehman

Matrix Software Company, Beverly Hills, CA

Source Language: BASIC-PLUS*Special Hardware Required:* RSTS-11 System, TTY

Abstract: SYSELF enables the user to find out statistics and other useful information about his current job. It requires NO privileges whatsoever, only that it should be stored execute-only in order that no mischievous users mis-use the program.

Media Price Code: D1**8008.BAS and 8080.BAS****RSTS-11-75***Author:* R. J. Tapp and G. D. Young

University of Victoria, Victoria, B.C., Canada

Source Language: BASIC-PLUS*Memory Required:* 8K

Abstract: These are cross-assemblers for the 8008 and 8080 microprocessors which use a language similar to Intel's standard assembly

RSTS-11-75 (Cont.)

language: instruction mnemonics are identical, but pseudo-instructions and expression formats are slightly different. Output is in the form of an assembly listing, alphabetical symbol table and object code in standard Intel hex format.

Documentation on Media.

Media Price Code: G30, H32

CYCLES

Author: Susan Lewis

Signal Processing Systems, Inc., Waltham, MA

Source Language: BASIC-PLUS

Abstract: This program formats a biorhythm chart for printing on either a user terminal or a line printer. Output may be directed to a CRT or hard copy terminal, to the line printer, or to a disk file. Output files beginning with an "L" are formatted slightly longer and wider for the printer.

The biorhythms are calculated by methods which assume birth and current dates to be between January 1, 1901 and December 31, 1999.

Media Price Code: D1

RSTS-11-76**XREF: Cross-Referencer for BASIC-PLUS Programs****RSTS-11-78**

Author: Jeffrey Mogul

218 Franklin Street, Newton, MA

Source Language: BASIC-PLUS

Memory Required: 6K minimum

Special Hardware Required: RSTS V4A or V04B

Abstract: XREF will generate a cross-referencing of any BASIC-PLUS source program. The output consists of a table of all of the lines in the program which are referenced by a GOTO, GOSUB, RESUME, etc. at some line in the program. The referencing lines are printed next to the lines that they reference. In addition, lines which are referenced but do not exist in the program can optionally be indicated on the printout. XREF will handle any proper BASIC-PLUS program, including multiple line statements and statements including ERL=, ERL>, etc.

Media Price Code: D1, G5

RSTS Performance Measurement Package**RSTS-11-79**

Author: Bud Dawson

MacMillan Bleodel Ltd., Vancouver, B.C., Canada

Submitted by: Rollins Turner

Digital Equipment Corporation, Maynard, MA

Source Language: BASIC-PLUS

Abstract: This package includes four programs used at MacMillan Bleodel.

1. LOGTIM.BAS stores the incremental values from the monitor statistics tables in a disk file approximately once per hour.
2. PRTIME.BAS prints data files created by "LOGTIM" in tabular form by hours.
3. GRAPH.BAS prints pertinent "CPU-TIME" data files created by "LOGTIM" in graph form by hours.
4. SUMGPH.BAS prints a summary graph of "CPU-TIME" by days within one or more months.

Media Price Code: H32

TDL/SCRIPT**RSTS-11-80**

Author: Rollins Turner

Digital Equipment Corporation, Maynard, MA

Source Language: BASIC-PLUS

Abstract: These programs allow the user to define and run interactive tests of the RSTS/E system. SCRIPT allows him to specify inputs to one or more keyboards, along with timing information. He can then run these "scripts" and the system will operate as if the specified lines of text had been input to real keyboards.

TDL allows the user to define more complex tests, using scripts as primitives. TDL is an extension of BASIC-PLUS, and allows the user to define the control structure of the test in terms of BASIC instructions. A preprocessor converts the TDL program into pure BASIC-PLUS. This program is then run to perform the test.

Documentation on Media.

Media Price Code: A8, H32

BATCH—Batch Processing for the PDP-11/20 with RSTS-11**RSTS-11-81**

Author: Albert F. Gettier, Jr.

Loyola College, Baltimore, MD

Operating System: RSTS-11 V4

Source Language: BASIC-PLUS

Memory Required: 8K

Abstract: BATCH is a program that simulates batch processing for RSTS11 version 4. The user places all the commands that are to be executed by the computer in a data file using BATCH. When all the commands are in the file, BATCH then "forces" the commands to a terminal as the computer is ready to receive them.

Through the use of BATCH, editing of the data file is quick and easy. BATCH also allows for procedures to be defined and has other runtime options and macros. Diagnostics and the date and time that the command is "forced" to the computer are printed on the terminal.

Restrictions: RSTS V4 only; must run under a privileged account

Media Price Code: A2, G8

Laramie High ECMEP Math Programs**RSTS-11-82**

Author: Mark Arnold

Laramie High School, Laramie, WY

Operating System: RSTS V4A-12

Source Language: BASIC-PLUS

Abstract: The Laramie High ECMEP Math Programs demonstrate several concepts of elementary analysis through BASIC-PLUS programs.

There are several programs which demonstrate that Taylor series of elementary functions hold true for complex numbers. Also included are Triangle solving programs, Taylor Series for real numbers, and other programs showing the use of the computer in Mathematics.

No tapes are offered, but the listings are brief enough to be entered via the keyboard. A printed example is included for each routine.

Restrictions: TAN⁻¹ evaluation incorrect

Media Price Code: D3

PAPTAP, MAGTAP, LISTAC—Additional Cusps for RSTS-11**RSTS-11-83**

Author: Mark Arnold

Laramie Senior High School, Laramie, WY

Operating System: RSTS V4A-12

Source Language: BASIC-PLUS

Abstract: Additional CUSP's for RSTS-11 include: PAPTAP, a program to create ASCII paper tapes, block letter headings; MAGTAP, for

RSTS-11-83 (Cont.)

reading EBCDIC formatted 9-track magtapes; LISTAC, for listing all files in an account, by use of the /BR option of PIP, and other utilities.

The source tapes offered are examples of PAPTAPE. Listings for all routines are short enough to be entered via keyboard.

Media Price Code: D2, G8

OMSI PILOT-73

Author: Jim Hollcraft

Oregon Museum of Science and Industry, Portland, OR

Operating System: RSTS/E V5

Source Language: BASIC-PLUS

Memory Required: 8K

RSTS-11-84

Abstract: OMSI PILOT-73 enables RSTS/E V5 to understand "core PILOT" by translating it to BASIC-PLUS. Although the initial translation can take as much as five minutes, the outputted BASIC-PLUS program runs faster than interpretive versions.

Media Price Code: A2, H32

BRANCH—DECAL Branching Scheme for "N"**RSTS-11-85****Right Out of "T" Tries**

Author: Jay Coniam

Berea High School, Berea, OH

Operating System: RSTS/E V05-C

Source Language: BASIC-PLUS

Memory Required: 4K

Abstract: This program designs the branching scheme for a given test in a lesson written in DECAL and determines if a student has achieved a standard of "N" correct answers out of "T" tries.

Media Price Code: D1, G5

OS/8 to RSTS Interface**RSTS-11-86**

Author: R. J. Tapp

University of Victoria, Victoria, B.C., Canada

Source Language: PAL-8

Memory Required: 1 page (128 words)

Other Software Required: OS/8 V3

Special Hardware Required: PDP-8 with 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, G8

COPY03: Backup Program (To and From all Devices Except DECTape)**RSTS-11-87**

Author: Bryan Steiner

Saskatchewan Technical Institute, Moose Jaw, Saskatchewan, Canada

Operating System: RSTS/E V6

Source Language: BASIC-PLUS

Memory Required: Approx. 10K

Abstract: COPY03 is an online backup program which will backup and restore system files and programs. The program runs under RSTS/E V6 and uses 10K of user space.

Restoring files to the system disk from magtape is simplified by using special magtape labels preceding each file on the tape. These labels store protection codes and clustersizes of the original files. The options available, when running the program, are similar to the system program BACKUP supplied by DIGITAL.

Media Price Code: D2

TUTOR**RSTS-11-88**

Author: Robert Lehman

Riverdale Country School, Bronx, NY

Operating System: RSTS/E

Source Language: BASIC-PLUS

Memory Required: 8K

Abstract: TUTOR was written to teach the use of the computer, but can be adapted for other teaching purposes as well. Provisions are made for review work and for progressively difficult tasks.

Media Price Code: D4

Floppy Disk Utility (RT-11 Compatible)**RSTS-11-89**

Author: Richard Szewczyk

Western Australia Institute of Technology, South Bentley, Western Australia

Operating System: RSTS/E

Source Language: BASIC-PLUS

Memory Required: 7K

Special Hardware Required: RX01 floppy disk drive, Teletype

Abstract: This program, similar in operation to PIP, allows multiple files to be saved on a floppy disk under RSTS/E. Files are stored in a format compatible with floppy storage under RT-11, enabling easy transfer of files between these two systems. Options include initialization of floppy, file transfer to and from floppy, listing the directory, file deletion and compression of files into one area.

Media Price Code: D2, H32, K27

DICE**RSTS-11-90**

Author: Marc Parker and Eric Mark Rintell

Lawrence High School, Cedarhurst, NY

Operating System: RSTS/E V06 A-2

Source Language: BASIC-PLUS

Memory Required: 8K

Special Hardware Required: PDP-11/4 and up, Teletype

Abstract: DICE is the Las Vegas game of "CRAPS". The computer will randomize how many dollars you start with, and keep track of your money. It will subtract your bet if you lose, and the pay-off is four-to-one. A bank limit of \$500. is set at the beginning of the game and you can get another chance at DICE if you go bankrupt.

Media Price Code: D1

RPGFNS: BASIC-PLUS Functions for Accessing RPG Files**RSTS-11-91**

WITHDRAWN

BASIC: Dartmouth BASIC to BASIC-PLUS**Text Editor***Author:* Adam Schneider and Bruce White

Cedarhurst, NY

Operating System: RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 5K**RSTS-11-92***Abstract:* Shelf/floor space productivity analysis allows a retailer or marketing student to analyze the profitability of product lines on a per square foot basis.*Restrictions:* Must use 132 column width paper*Media Price Code:* D2, G8

Abstract: This program makes a program written in Dartmouth BASIC runnable on a system that uses BASIC-PLUS. Some programs are not totally interchangeable, and appropriate warnings are printed during a run of the program. The user can, in most cases, replace Dartmouth functions, which have no BASIC-PLUS equivalent, by a few lines of coding or a user defined function.

Media Price Code: D2, G6**CHSBRD****RSTS-11-93***Author:* William T. Kane

Digital Equipment Corporation, Westminster, MA

Operating System: RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 12K

Abstract: CHSBRD is a BASIC-PLUS program that was written on a PDP-11 to run under the RSTS V06A-02 monitor. It was designed to be a "Learning" aid, and to keep local chess tournaments "Fair".

The program allows capture "Enpassant" and "Castling", but it has other limitations. It will allow a player to move his king into check, it requires a VT05 or VT05B to play, and it cannot yet "Play" against an operator. Throughout, it uses standard chess notation, and even has a three minute timeout period which will be made variable in the next release. If selected, it maintains a complete record of play on the system disk which is automatically QUEUED to the Line Printer when the game is finished.

Media Price Code: A2, G14**A Compendium of (DECAL) CAI Programs****RSTS-11-94***Author:* Berea City School District

Berea, OH

Submitted by: Anthony DiCenzo Education Products Group

Digital Equipment Corporation, Maynard, MA MA

Operating System: RSTS/E*Source Language:* DECAL*Memory Required:* 10K word user area*Other Software Required:* DECAL CAI System (QPEI0)

Abstract: Each CAI lesson represents the efforts of two weeks of intensive study during the workshop on such topics as: the development of behavioral objectives, orientation related to programming instruction, and extensive work on coding lessons for computer presentation. The CAI lessons were prepared by Berea City School District teachers and administrators who participated in a Computer Staff Development Workshop in July of 1975.

Media Price Code: A7, M55**SHELF****RSTS-11-97***Author:* Terence Murphy*Submitted by:* Glynn Rodean

Plymouth State College, Plymouth, NH

Operating System: RSTS/E V6A*Source Language:* BASIC-PLUS*Memory Required:* 8K*Special Hardware Required:* DEC PDP-11/50:RJP04 Disk Drive:
LA36 (132 PVS)*Abstract:* Shelf/floor space productivity analysis allows a retailer or marketing student to analyze the profitability of product lines on a per square foot basis.*Restrictions:* Must use 132 column width paper*Media Price Code:* D2, G8**The CASANOVA Package****RSTS-11-98***Author:* Francis Campos*Submitted by:* Francis Campos and Michael Hall

Lawrence University, Appleton, WI

Operating System: RSTS or RSTS/E V4A or later*Source Language:* BASIC-PLUS*Memory Required:* 8K 16-bit words (overlaid)

Abstract: CASANOVA is a package of programs and text files designed to provide Computer ASsisted instruction in *ANalysis Of VAriance*. It concentrates on teaching the computations involved in a variety of ANOVAs without confining the instructor to a particular orientation or text. Its usefulness rests on the assumption that performing ANOVA computations with the aid of the computer will contribute to understanding of the logic behind these computations. CASANOVA does the computations quickly, and provides feedback to partial solutions in order to monitor the student's performance. CASANOVA users should have had some introductory study of statistical inference, hypothesis testing and one-way ANOVA prior to using the package. The package consists of 21 BASIC-PLUS programs and 18 virtual core files containing text of instructions and help messages for users of the package. Documentation consists of a Student's Manual and an Instructor's Manual.

Restrictions: The package requires about 500 blocks of disk space for its own source and text files, and additional (variable) space for users.

*Documentation on Media.**Media Price Code:* H32**The CASANOVA Package Instructors Manual****RSTS-11-98B***Media Price Code:* E5**The CASANOVA Package Students Manual****RSTS-11-98C***Media Price Code:* E5**RUSROU: Multi-Terminal Russian Roulette****RSTS-11-99***Author:* Eric Mark Rintell

Optical Illusions, Cedarhurst, NY

Operating System: RSTS/E V06A-2A*Source Language:* BASIC-PLUS*Memory Required:* 8K*Special Hardware Required:* 2 or more TTY's PDP-11/40 UP

Abstract: This is the game of Multi-Terminal Russian Roulette; it will take up to six players a run at six different terminals, and a minimum of two players at two different keyboards. The game requires only 8K to run, and is a short game which does not require much knowledge of BASIC-PLUS.

Note: When running this game, only the starting person should be logged on while the players sit at keyboards on line, but not logged on. A CNTRL-Z of the other players keyboards may be required before playing.

Media Price Code: D2, G5

Computer-Oriented-Accounting Package*Author:* Connect/11 Educational Computer Ctr.

Newton Public Schools

Submitted by: Paul A. Shapiro

Newton North High School, Newtonville, MA

Operating System: RSTS V4B or RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 8K User Area*Special Hardware Required:* Any 132-column printing device supported by RSTS**RSTS-11-100****RSTS-11-103****CADA Monitor***Author:* Isaacs, Dekeyrel and Novick*Submitted by:* Isaacs and Dekeyrel

The University Of Iowa, 348 LCM, Iowa City, IA

Operating System: RSTS/E*Source Language:* BASIC-PLUS or DECsystem-10 BASIC*Memory Required:* 16K*Other Software Required:* Run from Program CADA

Abstract: This package of 17 accounting programs is designed to be used in conjunction with the course *Computer Oriented Accounting* by Wilbur F. Pillsbury, DBA. The student text and teacher's edition are published by South-Western Publishing Company. The programs can be utilized either in conjunction with a standard introductory accounting class or as the basis for a specialized course in automated accounting procedures. The entire package of program is oriented toward student users and is now being used extensively at both high schools in Newton. Functions performed include: journal entry, ledgers by accounts, balance sheets, trial balances, income statements, closing entries, adjusting entries, post-closing trial balances, worksheets, and more.

Media Price Code: A2, H32**DECUS-S.I.G. Seminar Programs and Documentation****RSTS-11-101***Author:* Martin Minow

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS/E V06B*Source Language:* BASIC-PLUS and MACRO-11

Abstract: The documentation is based on material that was prepared for the DECUS RSTS/E S.I.G. meeting in February 1977. It contains information on the coding standard used for RSTS/E V06B, commonly used PEEK sequences, the monitor statistics package, and several programs used to illustrate various features of RSTS/E—terminal I/O echo-control mode, pseudo keyboard usage, and an adaptive priority scheduler.

Media Price Code: A12, M55**RINNY2, Version B-2a, #1****RSTS-11-102***Author:* Eric Mark Rintell

Optical Illusions, 511 Central Ave., Cedarhurst, NY

Operating System: RSTS/E V06A-2*Source Language:* BASIC-PLUS*Memory Required:* 8K, 4K*Special Hardware Required:* PDP11/40 up, SEND/RECEIVE Terminal

Abstract: RINNY2 is a Star Trek Game played on a 1000 by 1000 by 1000 matrix. It uses INSTR.BAS for instructions only. This game plays you in command of a starship, and uses your name in a script using the characters from the television show. Every time you move, the computer (KLINGON) logically moves against you. Our objective is to obliterate the KLINGON with a 100 units or more of damage before he does it to you. It is an evenly played game with computer making one move at a time like you. RINNY2 requires a basic knowledge of mathematics.

Media Price Code: D2, G10**VBFILE: Variable Record Random Access File Handler Routines****RSTS-11-104***Author:* Ralph Lewis and Mark Nichols

California State University at Long Beach, Human Resources Management Dept., School of Business, Long Beach, CA

Operating System: RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 3K (2K as system minimum)

Abstract: The procedures and functions of VBFILE facilitate the random access of variable length record files. The procedures are fast in terms of computer access times, require little core storage, are economical in terms of file space (no full or null characters are used to pad physical records) and manage the file structure automatically. They are written using BASIC-PLUS record facilitates but do not require the programmer to concern himself with record 10 or the physical characteristics of the file. The procedures are modular. The user can select the modules he needs and these modules can be used in turn by other user written functions to achieve the type of record management system needed. The logical record to be managed is a variable length character string which has an associated physical record index. All details needed to map the physical record index to the logical record and put and extract logical records are handled by three functions.

Restrictions: File string cannot contain a tilde. (~ or CHR 126).*Media Price Code:* D2, G5**TECO-11: Text Editor and Corrector for RSTS/E****RSTS-11-105***Author:* Michael A. Hall and James S. Evans

Lawrence University, Appleton, WI

Operating System: RSTS/E, V6A-02 or V6B-02*Source Language:* MACRO-11*Memory Required:* 4K shared by multiple users

Abstract: TECO-11 for RSTS/E is a fast, versatile, character-oriented text editor that can handle any text files, including BASIC-PLUS programs. Advanced features such as nested iteration loops, conditional

RSTS-11-105 (Cont.)

execution blocks, and macro commands augment the many simpler editing commands for character-string searches, replacements, insertions, and deletions. TECO-11 honors all restrictions of protection codes and nonprivileged user status when it accesses files under RSTS/E. The TECO-11 system is implemented under RSTS/E as an alternate run-time system, which consists of 4K words of read-only, reentrant code that can be shared by any number of users, who gain access via brief BASIC-PLUS utility program. The distribution medium contains: object code for the TECO-11 run-time systems for RSTS/E V06A-02 and V6B-02, source code for the corresponding BASIC-PLUS utility programs for initiating TECO-11, and formatted text files for a beginner's manual (25 pages), a reference manual (86 pages), and a manager's guide (11 pages).

Note: The TECO-11 User Manual (DECUS 11-350) must be ordered separately. Write-up included with this program contains loading instructions only. Complete TECO-11 source files are not available from the DECUS Library.

Restrictions: Systems with only 16K user area under RSTS/E, V2A-02

No Source Available.

Media Price Code: A2, M55

RTMAG: Utility to Read RT-11 Magtapes under RSTS-11-106 RSTS/E

Author: Len Slosek

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS/E

Source Language: BASIC-PLUS

Abstract: RTMAG is a program designed to enable the copying of Magtape files in a format compatible with that used by the RT-11 PIP Program. It will read files from a tape which was created by PIP under RT-11 and transfer them in block mode to the RSTS system. Similarly, it will read files from RSTS in block mode and put them on tape. No attempt is made to read the data in the file. The format for the commands is similar to that used by the RSTS PIP although the options are different.

Documentation on Media.

Media Price Code: A1, M55

SOS-11**RSTS-11-108**

Author: William T. Marshall

Digital Equipment Corporation, Maynard, MA

Operating System: RSTS/E V6B

Source Language: BLISS-11

Memory Required: 11K

Abstract: SOS-11 is an easy to use but powerful line oriented editing system, available on the RSTS/E V6B operating system. It supports all the features of the PDP-10 program by the same name, and is operated in an almost identical manner.

SOS organizes the file into lines and pages, which can be referenced either by a line/page number or by textual content. Most commands operate on lines as single units, and one command (ALTER) includes a very powerful character oriented editing subsystem.

SOS operates on stream ASCII (BASIC+) files and RMS record formatted files, either type with or without sequence numbers.

Media Price Code: A7, H32, M55

Format: DOS-11

Middlebury College Utilities and Plotting Package RSTS-11-109

Author: James Condict, Peter Mullen, and James Krupp

Middlebury College, Middlebury, VT

Operating System: RSTS/E V6B

Source Language: BASIC-PLUS (some EXTEND mode)

Memory Required: 5K to 12K

Abstract: The "Middlebury College Utilities and Plotting Package" is a collection of several programs. The parts of the package are:

1. PLOT10/PLOTHP - BASIC-PLUS functions for complete support of Tektronix 4010 terminals; it includes functions for annotated axes, labeling at any angle, plotting lines with and without symbols for data points, and support of graphic input mode. Requires only 3K wds in addition to program. PLOTHP allows for the same program to produce identical plots on an HP7200 plotter without any program changes. Includes a user's guide in RUNOFF format.
2. MESMAN - Program to provide "mailbox" type of message facility when user's log onto RSTS. Special provisions for privileged and project director user numbers.
3. SYSMAN - Monitors terminals to insure no unused terminals are left logged onto the system; also collects terminal usage statistics by KB number.
4. REACT/MONEY/CHANGE - Complete rewrites of DEC CUSPs with added functionality and ease of use features, including group entering and deleting of accounts, usage statistics selectable on groups and printed in ppn order with totals and subtotals, and convenient password changing for non-privileged users.
5. BAT/TBAT - A low overhead (5K word with insignificant CPU utilization) extremely simple to use alternative to DEC batch. The TBAT version uses the user terminal for a log file, hence providing for indirect command file capability for any RSTS program. User's guide in RUNOFF format included.
6. GAMES - Program which controls access to game and demonstration programs based upon selected parameters including time of day, day of week, and number of active terminals on the system.

Restrictions: Requires PRINT USING and MAT support. Only tested with 4-word math package.

Documentation on Media.

Media Price Code: M55

Format: DOS-11

RSTS-11-110**STAT-11 Statistical Package**

Author: Michael D. Knauer

Digital Equipment Corporation

Submitted by: Ardeth H. Wilson

Central State University, Edmond, OK

Operating System: RSTS/E V6A or later

Source Language: BASIC-PLUS

Memory Required: 16K User Space

Abstract: STAT-11 is a statistical package which can be easily used by anyone, regardless of their experience with computers and computer programming. All of the information needed to perform statistical analyses with STAT-11 is contained in Chapter 2, including examples of actual STAT-11 programs.

The STAT-11 program and manual use certain conventions with which the user may not be familiar:

1. In the sample programs in the manual, information typed in by the user at the keyboard has been underlined to differentiate it from computer output.
2. In arithmetic expressions, an asterisk (*) is used to denote multiplication, and an upward-pointing arrow (^) to denote exponentiation.
3. A percent sign (%) appearing before a number in STAT-11 output indicates only that the number has exceeded the normal output format in length. The value of the number is still correct.

Documentation on Media.

Media Price Code: A2, P85

Format: RSTS

RSTS with PAMILA*Revised:* 10 August 1977*Author:* Dr. Richard A. Leavitt

Michigan State University, East Lansing, MI

Operating System: RSTS V4A-12*Source Language:* BASIC-PLUS*Memory Required:* Up to 8K (User area)*Other Software Required:* PAMILA*Special Hardware Required:* See abstract**RSTS-11-111**

- All of the user registers plus the PC, SP, and status bits can be dumped or altered by the user.
- A section of memory can be outputted in the Intel hex format.
- A register trace can be enabled which will dump the contents of the user registers prior to the execution of each instruction.
- A simulated switch register can be set by the user and read under program control.
- A counter which indicates the number of machine cycles that have elapsed can be printed or altered by the user.

Abstract: This software package includes eight programs and files that are intended to operate on data received from PAMILA, V1.0, a DEC system that quantitates analog signals from a variety of laboratory instruments (e.g., gas chromatograph), although any system which crunches analog data into peak area, height, retention time etc. could be easily adapted.

The major emphasis of this package is quantitation of unknown samples by external standardization techniques using detectors that are quite often non-linear in response.

Note: The DECUS Library staff was unable to determine the availability of other software which may be required in order to use this package.

*Documentation on Media.**Media Price Code:* D6, H32*Format:* RSTS**72PLOT—H-P 7202A Plotter Package****RSTS-11-112***Author:* Allan David Beach

Auckland Industrial Development Div., Auckland, New Zealand

Submitted by: J.B. Meikle*Operating System:* RSTS V4A-12*Source Language:* BASIC-PLUS*Memory Required:* 8K

Abstract: 72PLOT is a software suite designed to drive the Hewlett-Packard 7202A X-Y digital plotter to produce graphs with data points (any ASCII character, or special graphpoint shapes), or as lines between data points, or as a histogram plot. The user can select all axes parameters (scales, logarithmic or linear, linear increment etc.) on a variety of axed formats, and define a graph title and X and Y axes titles. A simple linear regression analysis permits plotting of the best straight line on a scatter diagram. For the histogram option, a Gaussian curve equal in area to the histogram can be drawn.

Original data can be disk, tape, or keyboard sourced; output can be the plotter, disc or tape.

An accessory program allows reorienting of the plot (from a prepared plot file) to give a vertical rectangular format. For accurate scientific graph plotting, a graph paper option is included which allows plotter settings to be aligned with printed grids.

Media Price Code: D4, G54**MICRO.BAS—8080 Based Microcomputer****RSTS-11-113***Simulator**Author:* Charles Perry Locke

Ogden College Computer Lab, Bowling Green, KY

Operating System: RSTS/E*Source Language:* BASIC-PLUS*Memory Required:* 16K user area

Abstract: MICRO.BAS simulates a microcomputer based on the Intel 8080. It will load and run programs that are in the Intel hex format (such as those produced by 8080.BAS - RSTS-11-75). In addition to loading and running programs, the following features are provided:

Any or all of user storage (32K) can be dumped or altered by the user.

Media Price Code: D3, M55*Format:* RSTS**GRAPH PACKAGE****RSTS-11-114***Author:* A. E. Lawrence

Luton College Of Higher Education, Luton, Bedfordshire, U.K.

Operating System: RSTS/E versions 6A & 6B*Source Language:* BASIC-PLUS*Memory Required:* May require 14K

Abstract: GRAPAK is a suite of programs designed for producing graphs on teletypes, line printers and similar devices. It has facilities for processing experimental data (in up to four parameters), carrying out intermediate calculations and least squares fitting if required. In addition, general functions can be plotted alone, combined with other functions (no limit on the number of functions), or combined with experimental data. This package has many applications and may be useful whenever data is to be displayed graphically. It is not designed to drive a graph plotter.

Note: Contact DECUS Library regarding availability of tapes.

Media Price Code: D14**HELP COMMAND****RSTS-11-115***Author:* Steven M. Coghill

Northern Kentucky University, Highland Heights, KY

Operating System: RSTS/E V6B*Source Language:* BASIC-PLUS*Memory Required:* 4 Kw Min

Abstract: This program provides information about CCLs, programs and online manuals at the user's terminal. The text files can be created via PIP or EDIT. Some help files are provided with RSTS/E. HELP is invoked via the CCL HELP.

Restrictions: Written in extended mode.

Media Price Code: D2, M55*Format:* RSTS**RSTS-11 Library Magtape Package #1****RSTS-11-LIB1**

Abstract: Consists of 2400 ft. magtape of all programs and documentation in the RSTS-11 Library from RSTS-11-1 through RSTS-11-93 except items that have been withdrawn or are no longer available. Documentation also includes RSTS-11-33 and RSTS 52 listings, and RSTS-11-34 manual.

Note: The 2400 ft. magtape can be purchased without documentation, Media Price Code P85.

Media Price Code: A280, C10, P350*Format:* DOS-11

RSTS-11 Library Package #2**RSTS-11-LIB2**

Abstract: Consists of 2400 ft. magtape with programs and documentation for RSTS-11-94, RSTS-11-115, and RSTS-11-97 through RSTS-11-113.

Note: The 2400 ft. magtape can be purchased without documentation, Media Price Code P85.

Media Price Code: A70, P140

Format: DOS-11

RSTS-11 Library RK05 Package #1**RSTS-11-DK1**

Abstract: Consists of 1 RK05 disk pack with currently available programs and documentation for RSTS-11-1 through RSTS-11-43. Documentation also includes RSTS-11-33 listing and RSTS-11-34 manual.

Note: The RK05 disk pack can be purchased without documentation, Media Price Code Q145.

Media Price Code: A130, Q260

Format: RSTS

RSTS-11 Library RK05 Package #2**RSTS-11-DK2**

Abstract: Consists of 1 RK05 disk pack with currently available programs and documentation for RSTS-11-44 through RSTS-11-67. Documentation also includes RSTS-11-52 listing.

RSTS-11-LIB2

Note: The RK05 disk pack can be purchased without documentation, Media Price Code Q145.

Media Price Code: A102, Q230

Format: RSTS

RSTS-11 Library RK05 Package #3**RSTS-11-DK3**

Abstract: Consists of 1 RK05 disk pack with currently available programs and documentation for RSTS-11-68 through RSTS-11-93.

Note: The RK05 disk pack can be purchased without documentation, Media Price Code Q145.

Media Price Code: A48, Q180

Format: RSTS

RSTS-11 Library RK05 Package #4**RSTS-11-DK4**

Abstract: Consists of 1 RK05 disk pack with currently available programs and documentation for RSTS-11-94, RSTS-11-97 through RSTS-11-106.

Note: The RK05 disk pack can be purchased without documentation, Media Price Code Q145.

Media Price Code: A42, Q170

Format: RSTS

Section 3 Standards

Section 3 STANDARDS

3.1 DEC Standards and other documentation related to standards such as programming conventions and guidelines, available through DECUS

DIGITAL Software Standards are software-related technical documents developed by DIGITAL. They cover items such as the format and organization of data on a tape, or how the month, day, and year should be printed on a directory listing.

DIGITAL Standards specify areas of compatibility across multiple products. In general, new products are required to conform to applicable standards, however, the applicability of any standard is subject to review in terms of the market needs of the particular product. The existence of a particular standard is NOT a commitment by DIGITAL to conform to specifications detailed in that standard.

Many software development issues are not covered by existing DIGITAL Standards, and not all existing DIGITAL Software Standards are available from DECUS. Users must make their own evaluation of whether or not these documents might be of value to them.

The following documents are available through DECUS:

DEC Standard for Basic Key Keyboard

Submitted by: Digital Equipment Corp.
Date: 11-Jan-74

Abstract: This specification describes a DEC standard basic 60-key keyboard layout which conforms to the ANSI X4.14-1971 standard typewriter keyboard. Two additional keys are reserved for future standardization requirements. This keyboard is available as a keyswitch array only, without electronics or with electronics completely encoded. In addition, an 11-key numeric pad is offered as an accessory attachment to the main keyboard, and a 19-key array pad without electronics is available for additional capability.

These keyboard layouts are intended for use on all new equipment designs introduced into production after January 1, 1974.

Media Price Code: A2

DEC STD 107

the manner described in the standard, DC2 and DC4, 22(8) and 24(8) formerly TAPE and NOT-TAPE respectively, are reserved for future use, likely for synchronization as well.

Media Price Code: A2

DEC Standard for Escape Sequences

Submitted by: Digital Equipment Corp.
Date: 1-Jul-74

Abstract: Indiscriminate echoing of ESC as (33)8 is prohibited. Where it is desirable to print some displayable character to provide visible confirmation that ESC has been received by the program, then that character must be single dollar sign (\$; (44)8).

ESC is the character which initially delimits an ESC sequence and ESC may carry no other meaning, even though ESC currently has many other meanings. Applies to all new DEC terminals.

Media Price Code: A2

DEC STD 110

Standard Date Format for Output
Submitted by: Digital Equipment Corp.
Date: 10-Feb-77

DEC STD 112

Abstract: This standard ensures an unambiguous interpretation of dates by readers around the world. This format is one which is in common use throughout most of the world, is reasonably terse, is well human-engineered and is easy to produce in any computer system.

Media Price Code: A2

DEC Standard for Terminal Synchronization

Submitted by: Digital Equipment Corp.
Date: 6-Mar-77

Abstract: DC1 and DC3, 21(8) and 23(8) formerly XON and XOFF respectively, are to be used for synchronization of terminal keyboards in

DEC STD 111

Standard for Indexes, Appendixes, Running Heads and Section Numbering for Software Documentation Manuals
Submitted by: Digital Equipment Corp.
Date: 22-Jan-76

DEC STD 118

Abstract: The requirements for an index are defined. Material suitable for appendixes is described. The use of running heads for chapter-oriented manuals is specified. The acceptable levels and numbering schemes of headings for both chapter-oriented and nonchapter-oriented software manuals are explained.

Media Price Code: A2

Cassette Format Standard for Labelled and Unlabelled Files
Retrieval number: 005-003-016-06

DEC STD 125

Submitted by: Digital Equipment Corp.
Date: 21-Feb-77

DEC STD 125 (Cont.)

Abstract: This standard should be read by hardware and software people. It describes the format and labelling conventions for files, physical blocks, logical records and data written on Digital Equipment Corporation Cassettes. It also describes the unlabelled standard. This standard must be followed when reading and writing cassettes intended for interchange between systems; it is recommended for other cassettes.

Media Price Code: A2

Standard for Updating Hardware/Software Manuals

*Submitted by: Digital Equipment Corp.
Date: 19-Aug-76*

Abstract: Document updates provide corrected, modified, or new information concerning a hardware/software product. This standard defines the format in which document updates are to be published.

Media Price Code: A2

**DEC Representation of Data Values in ASCII DEC STD 145
Character Strings for Information Interchange Standard**

*Submitted by: Digital Equipment Corp.
Date: 27-May-76*

Abstract: This standard defines the representation of data in character strings for interchange among DEC systems. It is an extension of ANSI X3.42. American National Standard for the Representation of Numeric Values in Character Strings for Information Interchange.

Media Price Code: A2

User Mode Diagnostic Standard

*Submitted by: Digital Equipment Corp.
Date: 10-Feb-77*

Abstract: This document defines general guidelines for user mode diagnostics. User mode diagnostics are tasks which run under the control of an operating system and attempt to detect and report hardware malfunctions to enable maintenance personnel to quickly complete corrective or preventive maintenance while the operating system continues to perform meaningful applications work. This standard specifies

both the functions performed by the diagnostic and the operating system services required to support each of these levels of user mode diagnostics. Applies to PDP-10 and PDP-11 processor families and all future systems.

Media Price Code: A2

Punched Card Format Standard

*Submitted by: Digital Equipment Corp.
Date: 19-May-77*

DEC STD 151

Abstract: This standard defines two formats for encoding data on industry-compatible 80 column tabulating cards for the purpose of ensuring that such cards may be used as a compatible means of information interchange between DIGITAL computer systems.

Media Price Code: A2

**Volume Identification for Removable Disk Pack DEC STD 167
Disk Systems**

*Submitted by: Digital Equipment Corp.
Date: 19-May-1977*

Abstract: This standard defines the format and location of the volume identification block required to allow disk packs of removable disk-pack systems to be identified in all CPU 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

BASIC-PLUS Software Conventions

*Submitted by: Martin Minow, Digital Equipment Corp.
Date: 28-Feb-77*

DEC STD A001

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

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Section 4.1

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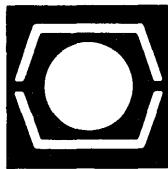
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RT-11

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| 11-146 | PDM70 Support Routines | 11-314 | RT-11 RUNOFF |
| 11-162 | CHSSLV: A CHESS-PROBLEM SOLVER | 11-315 | DIRECTORY: List Disk Directories |
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| 11-176 | RUN.MAC/SSWTCH.MAC | 11-319 | Nicolet 1090 Digital Oscilloscope Handler and Interface to PDP-11 |
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| 11-229 | INDEX: FORTRAN Cross Reference Program V02J | 11-186 | |
| 11-231A | ALGOL for RT-11 | 11-346 | |
| 11-232 | FORTH Programming System for the PDP-11 | | |
| 11-235 | CYCLES | | |

RSTS OPERATING SYSTEM

Absolute Loader for DOS, RT-11 and RSTS
 PASCAL Compiler for the PDP-11 (Swedish Version V04)
 The above programs are applicable to RSTS as well as other operating systems. See RSTS-11 Abstracts (Section 2.2) for complete list of programs for use with RSTS/E only.



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