PDP-8

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PDP-8 DIGITAL SOFTWARE NEWS

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The **PDP-8 Digital Software News** (a bi-monthly publication) complements Software Reviews for COS-310, OS/8, and OS/78. New and revised Software Product Descriptions, programming notes, software problems and solutions, and documentation corrections are published here. Much of the material is developed from Software Performance Report (SPR) answers significant to the general audience and is printed here to supplement the maintenance notebook (established by the Software Review).

PRODUCTS SUPPORTED in the PDP-8 DIGITAL SOFTWARE NEWS

COS-310 V8
COS-310/2780 RDCP V6.05, V7
OS/8 V3D
OS/8 V3D Device Extensions
OS/8 Extension Kit V3D
OS/8 FORTRAN IV V3D
OS/8 MACREL/LINKER V2A
OS/78 V2, V3
RTS-8 V3.0

DISTRIBUTION

The Digital Software News is directed to one software contact for each software product. No Mailing will be made to addresses without a software contact name. Address change requests should be sent to the nearest DIGITAL field office. Include the new address and mailing label from the most recently received publication.

Software binary and sources are provided under licenses only. The standard Terms and Conditions, OEM Agreement, and/or Quantity Discount Agreement contain the licenses for all binaries other than DECsystem-10.

Eleanor F. Hunter, Editor
Ann Owens, Associate Editor

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SPR USER LETTER

Submitted by Sheila Hatchell, 8/11 Administration

The Dispatch SPR User Letter has been revised to reflect the new SPR form which is now available. These forms can be obtained from your local DIGITAL Office or SPR Center, or by requesting them from SPR Administration.

How to Make the Best Use of the SPR Form

What We Can Do for You:

1. Blank SPR forms are available upon request in the desired quantities through the SPR Administration (P.O. Box F) and your local office/SPR Center.
2. Copies of the SPR acknowledgement and answer are sent to the appropriate DIGITAL Office/SPR Center for their information.
3. STATUS FOR SUBMITTED SPRs IS PROVIDED UPON REQUEST.
4. SPRs marked PROBLEM/ERROR will have a response for DIGITAL SUPPORTED products. These SPRs should refer to suspected deficiencies in the software.
5. SPRs marked SUGGESTION are forwarded to the pertinent software group for information purposes, and are responded to at their discretion.

What You Can Do for Us:

1. Fill out the form completely either by typing or printing clearly. **PLEASE INCLUDE YOUR SOFTWARE SERVICE CUSTOMER NUMBER IN THE ADDRESS BOX.**
2. Limit only one problem per SPR form. Several problems on an SPR can lengthen the turnaround time.
3. WHENEVER POSSIBLE, SUBMIT AN SPR WITH ATTACHMENTS, SUCH AS MACHINE READABLE DATA, DETAILED INSTRUCTIONS ON HOW TO REPRODUCE THE PROBLEM, PROGRAM AND/OR DATA FILES, LISTINGS, AND CONSOLE LOG.
4. It would be helpful to all concerned if problems with patches are reported as soon as possible.
5. For security SPRs, it is imperative that the DO NOT PUBLISH box be marked.
6. It would be helpful if tapes submitted with SPRs are labeled (track and density), and have a directory attached.
7. Complete the questionnaire that is supplied with each SPR answer. Your feedback is essential in monitoring the quality of our responses.
8. SPRs should not be used for problems concerning software policy, software distribution, or hardware. The local office should be contacted in these cases.

OS/8 V3D
UTILITIES
PAL8 V13A

Seq 21.22.4 F

1 of 1

TAB'S ARE TRANSLATED INCORRECTLY (KW)

Problem: TAB's following a label (PAL8) that are 6 characters long are translated into spaces incorrectly.

Diagnosis: This problem is evident only when CREF listings are requested during a PAL8 assembly.

Solution: The followng optional patch will correct this problem, improving the appearance of CREF output listings. Since this patch is optional, no change has been made to the version number of PAL8.SV.

```
.R FUTIL
SET DEV SYS
SET MODE SAVE
FILE PAL8.SV
1363/5764
1364/4321
4321/7200
4322/1363
4323/4762
4324/7200
4325/4761
4326/5760
4360/1372
4361/0735
4362/1000
4363/0211
WRITE
EXIT
.
```

OS/8 V3D
UTILITIES
ABSLDR V6B

Seq 21.29.1 M

1 of 1

LOADER PROBLEM WITH SAVE IMAGE FILES (BS)

There is a problem in that Loader does not work with Save Image files. The following patch, applied via FUTIL, will correct this problem.

```
.R FUTIL
SET DEV SYS
SET MODE SAVE
FILE ABSLDR.SV
14105/7000
14106/7000
14107/7000
14110/7000
12200/6603
WRITE
EXIT
```

Note that the above patch upgrades ABSLDR from version 6B to version 6C.

PDP-8 DIGITAL SOFTWARE NEWS
CUMULATIVE INDEX
JUNE/JULY 1980

This is a complete listing of all articles for current products supported in the 8 Digital Software News. Missing sequence numbers may pertain to problems unique to other versions of the same product.

IMPORTANT!

Unassigned articles are indicated: UNASSIGNED.

Flags are currently being installed for all articles. The flags and definitions are as follows.

M = Mandatory Patch. These patches correct errors in the software product. All users are required to apply these patches to maintain consistent "user level" unless the accompanying article specifies otherwise.

F = Optional Feature Patch. These patches extend or configure functionality into the product. These functions will be treated as a supported part of the product for the duration of the current release and will be incorporated with any future release, unless otherwise stated.

R = Restriction. These articles discuss areas that will not be patched in the current release because they require major modifications orr because of the product. Restrictions, except those described as permanent, are reviewed and modified when possible as part of the normal release cycle.

N = Note. These articles provide explanatory information that supplements the manual set and provide more detailed information about a program or package. They also provide procedural information to make it easier to use a program or package.

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F4.SV V4A		
PASSING ARGUMENTS	01 R	Oct 77
EQUIVALENCE STATEMENT	02 M	Oct 77
COMPILER VERSION NUMBERS	03 N	Oct 77
COMPILER GENERATES WRONG LENGTH	04 O	Oct 77
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FORMATTED INPUT RECORDS LONGER THAN 132 CHARACTERS	02 O	Oct 77
RUNNING FORTRAN IV UNDER BATCH IN 32K	03 O	Oct 77
FPP-8A	04 O	Oct 77
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USING THE PDP-8/A PARALLEL PORT FOR A LINEPRINTER	21.1.1 N	Mar 78
SOFTWARE REVIEW CORRECTION	21.1.2 N	Dec/Jan 80
PROBLEM WHEN YOU DESTROY BATCH	21.1.3 N	Aug/Sep 78
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Software Product Description

PRODUCT NAME: OS/78, Version 3.0
DECstation Operating System

SPD 4.3.6

DESCRIPTION:

OS/78 is a comprehensive executive designed to support the DECstation 78 and DECstation 88 computer systems. OS/78 provides an extensive collection of application software development tools and an efficient run-time environment for the production use of these application programs. OS/78 is controlled through a Concise Command Language (CCL) that simplifies program development and execution (e.g., COPY, LOAD, HELP, etc.)

Programs stored on diskettes can be accessed for loading, modification, or execution by simple keyboard commands. OS/78 also allows program chaining, so that a complex program can be divided into a series of smaller modules.

The CCL allows the user to operate the system through terminal commands. Three classes of functions are available through CCL: system functions, language functions, and utility functions.

System Functions:

Batch Processing

The SUBMIT instruction calls in a batch processor to execute a sequence of commands that have been stored in a file. This feature permits the user to execute a series of predetermined operations using a single command. SUBMIT also provides an optional method for redirecting line printer output to diskette files when there is no line printer in the system.

I/O Handlers

The following handlers are provided with OS/78:

- RX01/RX02 — System handler provided on RX01 or RX02 media
- RL01 — System handler on RL01 media
- RX01/02 — Non-system handler (not permanently resident in memory) for Drive 1 of RX subsystem
- RX01/02 — Non-system handler (not permanently resident in memory) for Drive 2 & 3 of RX subsystems

(Supplied in two versions — one for RX28, one for RX78)

- RL01 — Non-System handler (not permanently resident in memory) for RL01 disks

  One version for Drive 0 logical, regions A & B
  One version for Drive 1 logical, regions A & B
  One version for section C on Drives 0 and 1

NOTE: Each RL01 Drive is logically segmented into three independent file structured regions.

Section:
A is 4095 blocks
B is 4095 blocks
C is 2018 blocks

- TTY — is a non-system, non-file-structured handler for the console terminal
- LPT — is a non-system, non-file-structured handler for an LA78 or LA8/A line printer
- SLU2 — is a non-system, non-file-structured printer handler for a serial printer attached to the SLU2 port of a VT78. Supported printers are LA34, LA36, LA38, LA120, and LA180-S.
- SLU3 — is equivalent to SLU2 for the SLU3 port of the VT78
- VLU2 — is a non-system, non-file-structured handler for SLU2 port of the VT78. It allows bi-directional, half duplex transmission but does not provide XON-XOFF terminal synchronization and therefore, does not fully support the operation of the VT100, LA34, LA38, or LA120. It does support the requirement of the VT52 and LA36.
- VLU3 — is similar to VLU2 for the SLU3 part of the VT78.
- LQP — is a non-system, non-file-structured handler for the LQP78 or LQP8/E parallel letter quality printers. It allows operation only as a standard line printer equivalent (the special features of the LQP printer are not accesible to the user).

Only nine handlers are allowed to be simultaneously resident in the monitor system. Of these, seven are selected by the user while two (SYS and TTY) are permanently installed. The user can specify their choice of these seven handlers by use of the .SET HANDLER command.

System Configuration

The SET command enables the user to set TTY handler options. (Examples: print-line length, read-only device, etc.)

Concurrent Processing (Symbiont)

A symbiont is a user-written, interrupt-driven assembly language program that uses the upper 4K words of memory. The symbiont is supported only on DECstation 78 computers. The OS/78 symbiont facility allows such a symbiont task to run in parallel with OS/78 while OS/78 operates normally in 12K words of memory. The symbiont task can run communications, print, monitor real-time jobs, etc.

Simple keyboard commands can be used to start the symbiont or to return OS/78 to single-task operation with 16K words of memory (on 78/nn models only).

OS/78 includes an LA78 printer-spooler symbiont (on 78/nn models only).

File Management

The system provides standard routines for the creation, modification, renaming, and deletion of files. CCL commands invoke these routines.

Language Functions

BASIC

OS/78 BASIC is implemented as a compiler language. It consists of an editor, compiler, and a run-time system, all three supporting BASIC's dual functions as an interactive program development tool and a system for both interactive and batch-mode program execution.

OS/78 BASIC includes features oriented to the commercial user:

- Multiple Data Formats — The system supports three types of data format; floating point numeric, alphanumeric string, and commercial decimal (numeric string) data.
- Commercial Decimal Arithmetic to 15-digit precision, including data format conversion
- PRINT USING statement for formatted printing of numeric strings; especially useful for columns and tables
- Full upper/lower case capability
- Cursor control function to facilitate data entry
- Random-access record oriented I/O for rapid storing and retrieval of individual records
- OS/78 BASIC programs can utilize up to 4 concurrent I/O handlers (one of which must be SYS) and up to 5 open I/O files

Assembler

The PAL command calls a three-pass assembler. The optional third pass creates a side-by-side octal and symbolic listing and symbol table. This assembler accepts input generated by the EDIT function and generates output acceptable to the LOAD (absolute loader) and Cross Reference Utility (CREF) functions.

FORTRAN

OS/78 FORTRAN IV permits generalized array subscripting and 1- to 7-dimension arrays. Large amounts of data can be easily stored and accessed. FORTRAN IV also offers direct access I/O. With this feature, the user can directly reference any record in a data file.

OS/78 FORTRAN IV supports mixed-mode arithmetic, octal constants, logical IF statments, and general integer expressions in IF statements. In addition, OS/78 FORTRAN IV allows initial values in operators, including EQU and XOR.

Text manipulation is aided by Hollerith field specifications for text as well as literals and constants. DATA statements, BLOCK statements and BLOCK DATA statements are supported.

OS/78 FORTRAN IV has a library of mathematical functions for calculating logarithms, absolute values, and trigonometric functions. Other functions manipulate character strings.

Utility Functions

The HELP utility can display on the screen instructions for use of OS/78 utilities and languages.

EDIT calls a symbolic editor which is used to create and modify ASCII source files so that these files can be used as input to BASIC, the PAL8 assembler, or the FORTRAN IV compiler.

LOAD calls an absolute loader which reads a binary program into memory and creates a resident memory image suitable for addition to the system library or for immediate execution.

Octal Debugging Technique (ODT) allows the user to run programs under carefully controlled conditions, modify programs during execution, or monitor the state of main memory and processor registers.

Cross Reference Utility Program (CREF) aids the development programmer in writing, debugging, and maintaining assembly language programs by providing the ability to locate all references to a particular symbol. Input is supplied to CREF in the form of an ASCII listing file produced by the PAL assembler.

The MAP command runs a utility program that constructs a table showing the memory locations used by a particular binary file. This feature assists the programmer in allocating memory.

DIRECT produces a listing of the file directory for any OS/78 storage medium.

DUPLICATE allows the copying of an entire diskette with a single command.

The COPY command transfers one or more selected files between storage medium and I/O devices. The method of specifying files is flexible and allows users to move selected groups of files with simple commands.

The FORMAT command allows a user to initially structure an RL01 disk pack to be consistent with the operator of the OS/78 I/O handlers.

RXCOPY has been modified to include a single/dual density switch.

MINIMUM HARDWARE REQUIRED:

DECstation 78/40, 78/50, 78/60, 78/70
DECstation 88/50, 88/70, 88/80, 88/90, 88/92, 88/97
RX01 — Dual Drive (RX08 subsystem, RX78 subsystem)
RX02 — Dual Drive (RX28 subsystem, RX78 subsystem)
RL8/A — Dual Drive or single drive plus RX02 dual drive

OPTIONAL HARDWARE:

LQP 78 Letter Quality Printer
LA78-P Line Printer
Additional RX78 Dual Floppy Disk Drive
LA8/A, LA78, LQP8/E Parallel Printers
LA34, LA36, LA120, LA180/S Serial Printers

PREREQUISITE SOFTWARE:

If the user wishes to generate the OS/78 monitor from the OS/78 source kit, the user is required to use OS/8 Combined Kit, V3D. Also, MACREL/LINKER is required to generate some of the modules of OS/78 from the OS/78 source kit.

OPTIONAL SOFTWARE:

OS/8 Combined Kit V3D
OS/8 MACREL/LINKER

TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED

OS/78 is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

OS/78 is a software product engineered to be installed by the customer and includes other Software Product Support Services listed below.

SOFTWARE PRODUCT SUPPORT:

OS/78 includes standard services as defined in the Software Support Categories Addendum of this SPD.

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

Options with no support services are only available after the purchase of one supported license.

A single-use license only option is a license to copy the software previously obtained under license.

Sources and/or listings options are only available after the purchase of at least one supported license and after a source license agreement is in effect.

The following key (Q, X, Y) represents the distribution media for the product and must be specified at the end of the order number, e.g., QF022-AY = binaries on RX01 Floppy Diskette.

Q = RL01 Disk Cartridge
X = RX02 Double Density Diskette
Y = RX01 Floppy Diskette

This software is available with a valid DECstation 78A or 88A configuration that includes support services, binaries and documentation.

QF022 -A— Single-use license, binaries, documentation, support services (media: Q, X, Y)

Users of one of the PDP-8E/M/F/A systems with 16K words of memory, OS/8 supported console and mass storage device (RX01, RX02, RL01) may order without services:

QF022 -C— Single-use license, binaries, documentation, no support services (media: Q, X, Y)

QF022 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

QF022 -E— Sources (media: Q, Y)

QF022 -F— Listings (media: R)

Upgrade Options

Customers who are currently licensed users of OS/8 Combined Kit V3D may obtain this new product by purchasing a license to an upgrade kit for use on the same CPU as their previous license.

QF023 -C— OS/78, Version 3.0 single-use license, binaries, documentation, no support services (media: Q, X, Y)

Update Options

Users of OS/78, Version 2 whose specified Support Category warranty has expired may order under license the following software update at the then current charge for such update. The update is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QF022 -H— Binaries, documentation (media: Q, X, Y)

QF022 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

Users of OS/78, Version 2 whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QF022 -W— Binaries, documentation (media: Q, X, Y)

Sources/Listings Update Options

The following options are available to licensed users as updates to sources and/or listings options. The update is distributed in source form on the appropriate medium and includes no installation or other services unless specifically stated.

QF022 -N— Sources (media: Q, Y)

ADDITIONAL SERVICES:

None

digital
Software Product Description

PRODUCT NAME: COS-310, Version 8.02
Commercial Operating System-310

SPD 5.98.10

DESCRIPTION:

COS-310 is one of DIGITAL Equipment Corporation's DATASYSTEM 300 Series Commerical Operating Systems. It is an applications development tool for EDP users who wish to implement data management functions for small to medium-size business applications. COS-310 is a self-contained, single-user, disk-resident operating system. It provides an operation control monitor, an easy-to-learn, high-level programming language (DIBOL), program preparation, debugging, and production utilities.

COS-310 Monitor — COS-310 provides software operation control through the system monitor. For memory economy, the monitor resides in two segments: one segment is memory-resident and the other segment resides on the system device. The monitor includes a comprehensive set of commands which control the editing and execution of programs, and the maintenance of file directories.

The monitor contains all the necessary I/O device handlers for the system. The COS-310 monitor device options include line printers and disk storage devices.The monitor size is 8K bytes. If an RL01 or RL02 disk drive is used the monitor size is 16K bytes and a total system main memory of 64K bytes is required. A Letter Quality Printer (LQP) requires an additional 8K bytes.

Editor — The COS-310 editor is an interactive line oriented text editor that is part of the monitor. The COS-310 editor provides a means to either sequence and resequence line numbers with the use of simple commands. The editor receives input through the console keyboard. Output from the editor can be a file listing on either the console screen or the line printer.

DIBOL Language — DIGITAL Equipment Corporation's Business Oriented Language (DIBOL) is built around procedural verbs that permit the programmer to arrange information for desired execution and output. These procedural statements (commands plus data) permit data manipulation, calculation of arithmetic expressions, subscripting, overlaying of records, clearing of memory or buffers, file initialization, branching, program chaining, and printing overlapped with processing.

A DIBOL program is divided into two sections: a data definition section and a procedure section. The data definition section defines the type and size of the data variables. The procedure section defines the procedures required tc properly process the data. These procedures are executed through the use of procedural verbs. These verbs are: PROC, XMIT, READ, STOP, CHAIN, ACCEPT, DISPLAY, TRAP, and INCR.

Debugging Aids — COS-310 includes several features that facilitate DIBOL program debugging.

- CREF — Cross Reference provides an alphabetical listing of all symbols used in the DIBOL program, the line number where each symbol is defined, and all the line numbers where each symbol is used.
- DAFT —.The Dump and Fix Technique has the ability to search for, examine, list change records, and make minor adjustments to a data file.
- TRACE/NO TRACE — An intregal DIBOL language feature. Each trace enables the executed DIBOL statement to print a line containing the source file line number.
- DDT — The DIBOL Debugging Technique features breakpoint, variable examination, subroutine call traceback and iteration.

FLOW (FLOW Chart Generator) — FLOW is a utility program designed to assist in the program documentation process. FLOW will generate a printed flowchart from a set of easily understood commands. The FLOW commands can optionally be included in the DIBOL source program.

COMP — This utility program translates a DIBOL source file created by the system's editor into interpretive code. This file can be stored on disk, listed on the printer, or run immediately. No linking is required to run a program. When no listing is required, program compilation usually takes 10 to 30 seconds. This is a substantial improvement over other products having slow compilers and required program linking.

SYSGEN (SYStem GENeration) — SYSGEN is a conversational utility program that allows the user to change the current device handlers or create a new system disk. SYSGEN uses simple English-like statements, prompted to the operator from the program. Changing the handlers provides the user with the ability to specify the disk and line printer I/O handlers that will operate most effectively in the system. In addition to changing the selected handlers in the current system, SYSGEN can copy the system from either an RX01/RX02 to an RK05, RL01, or RL02 and vice versa for installation start-up.

START-UP FILE — A start-up file can be optionally specified in SYSGEN to start a job after the operator bootstraps the system and enters a valid date.

DFU (Data File Utility) — DFU allows the user to designate and examine logical unit assignments. The use of logical unit assignments for data files provides data file device independence for the programs using COS-310. Logical unit assignments can be input to the DFU from the console keyboard, from a command file stored on the system device, or from the edit buffer. The current logical unit assignments can be either displayed or printed.

PATCH — The PATCH program has the capability to perform automatic patching of the COS-310 system. PATCH is used to fix either a system program or the COS-310 monitor. All input information for the PATCH operation is distributed as official patches from DIGITAL Equipment Corporation. The PATCH information is a line-by-line dialogue that is input through the console keyboard.

SORT — COS-310 SORT is a multiphase sort that can reorder a data file containing fixed length records into a specified sequence. The user can specify up to eight fields (with sub-fields) of a fixed length record as a sort key. A file can be sorted in either the ascending or descending sequence of the contents of the fields in each record. SORT also has merging capability. This allows each volume of a multivolume file to be sorted independently and then merged with the other volumes within the file. Both sort and merge capabilities are parameterized by a sort control file.

PIP (Peripheral Interchange Program) — PIP is a utility program that transfers files from one device to another. It can replace an existing file with a new file and allow data files to be combined. It can accept input from disk and produce output on terminal, disk, or the line printer. PIP includes the capability to enter PIP commands from a predefined command file in addition to the keyboard. This eliminates the need for an operator response to PIP's prompts, thereby reducing the possibility of operator error.

PRINT — PRINT is a utility for the creation of report programs. Using a parameter file which describes the report, PRINT will generate a DIBOL program that will produce that report.

MENU — The MENU program allows the operator to select and execute commands from a previously created command file. This command file is displayed on the screen. The MENU program reduces operator errors in selecting programs to be run.

BATCH — Commands to run DIBOL program and system utilities can be stored in a BATCH file. These job streams can be run by operator command or by the MENU utility.

FILEX (File Transfer Program) — FILEX is a file transfer utility that can be used to transfer COS-310 formatted files stored on RK05 disks into OS/8 formatted files and vice versa. FILEX permits data files on an RX02 diskette to be moved onto an RX01 diskette loaded into the second RX02 disk drive. Transfer of RX01 disk files to RX02 files is also permitted.

In addition, FILEX can be used to transfer a COS-310 file onto an RX01 diskette in a format directly readable by the IBM 3741 series data entry terminal. IBM files on single-density diskettes can be transferred to COS-310 format provided they are single volume and there are no bad tracks on the diskette media.

Format Programs — DKFMT formats RK05 disks. DLFMT formats RL01 or RL02 disks. DYFMT converts an RX01 diskette into an RX02 diskette. Except for COS-310 software distributed on an RX02, any diskette used on an RX02 drive must be formatted before being used.

SUPPORTED MASS STORAGE DEVICES:

COS-310 supports RX01s, RX02s, RK05s, RL01s, and RL02s for storage of data files. The following lists the capacities of these devices.

DEVICES	SEGMENTS	BLOCKS	BYTES
RX01	41	656	335,872
RX02	61	976	499,712
RK05	406	6,496	3,325,952
RL01	638	10,208	5,226,496
RL02	1,278	20,448	10,469,376

MINIMUM HARDWARE REQUIRED:

One of the following (with a minimum of 32K bytes of memory):

- DECstation 78/50, 78/70, 88/50, or 88/70

One of the following (with a minimum of 64K bytes of memory):

- DECstation 88/80 or 88/90

Although COS-310 is intended to run primarily on DECstations it will operate on all similarly configured systems having the minimum memory requirements and supported media.

OPTIONAL HARDWARE:

DECstation-78

- Up to four RX01 floppy disk drives (1)
- Up to four RX02 floppy disk drives (1)
- One LA8, LQP8, LA34, LA35, LA38, LA120, or LA180-EA printer

DECstation-88

- Up to four RX02 floppy disk drives
- Up to four RL01 disk drives (2) (minimum of 64K bytes of memory)
- Up to four RL02 disk drives (2) (minimum of 64K bytes of memory)
- One LA34, LA35, LA38, LQP8, LA8A, LA120, LA8, LP05 or LA180-EA printer

NOTES:

(1) RX01 and RX02 drives are not supported by the same system.
(2) RK05, RL01, and RL02 drives are not supported by the same system.

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE:

COS-310 2780/3780 Communications Software

TRAINING CREDITS:

TWO (2) — Applies only to options that include support services. Consult the latest Educational Services Catalog at your local DIGITAL office for the available courses, course requirements, and guidelines.

SUPPORT CATEGORY:

DIGITAL SUPPORTED

COS-310 is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

COS-310 is a software product engineered to be installed by the customer and includes other Software Product Support services listed below.

SOFTWARE PRODUCT SUPPORT:

COS-310 includes standard services as defined in the Software Support Categories Addendum of this SPD.

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU.

All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

The following key (E, H, Q, X, Y) represents the distribution media for the product and must be specified at the end of the order number, e.g., QF310-AX = binaries on RX02 Double Density Diskette.

E = RK05 Disk Cartridge
H = RL02 Disk Cartridge
Q = RL01 Disk Cartridge
X = RX02 Double Density Diskette
Y = RX01 Floppy Diskette
Z = No hardware dependency

This software is included with the systems listed in the minimum hardware section of this SPD, and is offered with support services (includes hardware, single-use license, binaries, documentation, and support services). Systems are also available which include a single-use license (no binaries, no documentation, and no support services).

COS-310 is also offered with full DIGITAL support services only on hardware configurations that meet minimum system requirements. A customer would order the line item:

QF310 -A— Single-use license, binaries, documentation, support services (media: E, H, Q, X, Y)

Update Options

Users of COS-310 whose warranty has expired or whose Standard Program Update Service has expired, may order under license the following software update at the then current charge for such update. Except where the medium is designated as Z, the update is distributed in binary form on the appropriate medium. A software update where the medium is designated as Z grants the user of COS-310 the right to copy the previously ordered QF310-H or QF310-W software update for use on an additional single CPU for which a COS-310 license has been obtained.

QF310 -H— Binaries, documentation (media: E, H, Q, X, Y).

QF310 -H— Right to copy for single-use (under existing license), no binaries, no documentation, no support services (media: Z)

Users of COS-310 whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QF310 -W— Binaries, documentation (media: E, H, Q, X, Y)

Miscellaneous Options

QF310 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

None

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

INTRODUCTION

DECUS, the Digital Equipment Computer Users Society, was established in March of 1961 to advance the effective use of DIGITAL computers. It is a not-for-profit users group supported in part by Digital Equipment Corporation.

OBJECTIVES

The objectives of the Society are to advance the effective utilization of computers, computer peripheral equipment, and software manufactured and marketed by Digital Equipment Corporation, by promoting the interchange of information concerning their uses; advance the art of computation through mutual education and exchange of ideas and information; establish standards and provide channels to facilitate the exchange of computer programs among DECUS members; provide feedback to the computer industry on equipment and software needs; and to reduce the duplication of development efforts.

ORGANIZATION

The Digital Equipment Computer Users Society is a federation of chapters, whose membership is determined by geographic location. The membership is organized to meet the specific needs of members in its area such as Symposia and Special User Group activities. The DECUS chapters are:

- *AUSTRALIAN CHAPTER (Australia, Indonesia, Malaysia, New Zealand, PNG, Singapore,)*
- *EUROPEAN CHAPTER (Europe, Middle East, North Africa, Russia)*
- *CANADIAN CHAPTER (Canada)*
- *U.S. CHAPTER (U.S. and All Others)*

ACTIVITIES

1. SYMPOSIA

Symposia are sponsored throughout the year by each of the DECUS Chapters and Regional/National User Groups. These meetings provide an opportunity for users of DIGITAL computers to meet with other users and with DIGITAL management, engineers, and customer service representatives. They provide a forum for users to exchange information on technique and approaches to issues of common interest and to provide feedback to DIGITAL on existing and future products and services. Sessions at the symposia include user-driven workshops, tutorials, product panels, as well as application/system-specific presentations.

The technical papers and presentations from each symposium are published as DECUS Proceedings.

2. SPECIAL USER GROUPS

DECUS encourages subgrouping of users with common interests and/or geographical proximity.

Special Interest Groups (SIGs) promote the interchange of specialized information for application areas, subject areas (such as languages), or specific operating systems. A group of users must petition the Chapter Executive Board for recognition as a Special Interest Group. The group must have a chairman, a DIGITAL representative, and its organization must meet the guidelines of the Chapter Executive Board.

Geographic subgroupings are formed to service the DECUS members within a specific area although they may also be based on interests as in SIGs. There are four types of geographic subgroupings:

1. *LUGs — Local User Groups*
2. *NUGs — National User Groups*
3. *RUGS — Regional User Groups*
4. *SLUGs — Student Local User Groups*

3. STANDARDS

DECUS promotes user activity in reviewing DIGITAL standards. Users are given the opportunity to comment on DIGITAL standards prior to their finalization.

4. PROGRAM LIBRARY

One of the major activities of the users group is the DECUS Program Library. The Library contains programs written and submitted by users and is maintained and operated separate from the Digital Software Distribution Center. A wide range of software is available, including languages, editors, numerical functions, utilities, display routines, and various other types of application software.

MEMBERSHIP

Membership in DECUS is voluntary and is not subject to membership fee. Members are invited to take an active interest in the Society by contributing to the Program Library, to newsletters, and by participating in its Special User Groups and Symposia. There are two types of membership: Installation Membership and Association Membership.

INSTALLATION MEMBERSHIP

An organization, institution, or individual that has purchased, leased or has on order a computer manufactured by Digital Equipment Corporation is eligible for Installation Membership in DECUS.

An Installation should appoint a person immediately concerned with the use of the computer to act as delegate to the Society. A delegate receives all official communications and has a vote on DECUS policies and elections. An organization or company is eligible for as many voting delegates as it has DIGITAL computers. Each delegate must file an application for Installation Membership.

ASSOCIATE MEMBERSHIP

Any person who is not an appointed Installation Delegate, who has a bona fide interest in DECUS is eligible for Associate Membership.

Membership status is acquired by submitting the enclosed application to the appropriate Chapter Executive Secretary for approval by the Chapter Executive Board.

To obtain a membership form for DECUS, please return this form to the appropriate Chapter office listed below.

NAME: _____
(First) (Last/Family Name)

COMPANY: (INSTALLATION): _____

ADDRESS 1: _____

2: _____

3: _____

4: _____

(City, Town, State, Province, and Zip, Postal Code)

COUNTRY: _____

TELEPHONE: _____ TELEX _____

I obtained this form from _____

DECUS OFFICES

DECUS Australia
P.O. Box 384
Chatswood
NSW 2067
Australia

DECUS Canada
P.O. Box 11500
Ottawa, Ontario K2H 8K8
Canada

DECUS Europe
P.O. Box 510
12, avenue des Morgines
CH-1213 Petit-Lancy 1/GE
Switzerland

DECUS U.S. and
Office of the Executive Director
One Iron Way
Marlboro, Massachusetts 01752
USA

DECEMBER 1979

SOFTWARE PROBLEMS OR ENHANCEMENTS

Questions, problems, and enhancements to DIGITAL software should be reported on a Software Performance Report (SPR) form and mailed to the SPR Center at one of the following Digital Offices: *(SPR forms are available from the SPR Center).*

Areas Covered	SPR Center
United States; remainder of Far East, Middle East, Africa Latin America	Administrative Services Group, SWS P.O. Box F Maynard, Ma 01754
Canada	Digital Equipment Canada P.O. Box 11500 Ottawa, Ontario Canada K2H 8K8
United Kingdom, Bahraine, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Qatar, Oman, Saudi Arabia, Syria, United Arab Emirates, Yemen, Arab Republic.	Digital Equipment Corp. LTD Fountain House Butts Centre GB - Reading RG17QN England
Australia-Melbourne	Digital Equipment Aust. PTY. LTD 60 Park Street So. Melbourne Victoria Australia 3205
Australia-Sydney	Digital Equipment Aust. PTY. LTD 123 125 Willoughby Rd. P. O. Box 491 Crows Nest NSW Australia 2065
Brazil	Digital Equipment Comercio Ind. Rua Batatais 429 Esq AL Campin 01423 Jardim Paulista Sao Paulo 0100 Brazil
Caribbean	De Latin America P. O. Box 11038 Fernando Juncos Sta. Santurce PR 00910
France	Digital Equipment France 18, rue Saarinen France Silic 225 F - 94528 Rungis - Cedex France
Italy	Digital Equipment S.P.A. Viale Fulvio Testi 117 I-20092 Cinisillo Balsamo Milan, Italy

Areas Covered	SPR Center
Japan	Digital Equipment Corp. INTL 3rd Floor Kowa Bldg. 8-7 Sanban Cho Chiyoda Ku Tokyo 102 Japan
New Zealand	Digital Equipment N.Z. LTD P.O. Box 17093 Greenlane, Auckland 5, New Zealand
Belgium, Holland, Luxemburg	Digital Equipment B.V. KAAP Horndreef 38 NL - Utrecht/Overvecht Holland
Sweden	Digital Equipment Corp. AB Englundavägen 7 S-171 24 Solna, Sweden
Denmark	Digital Equipment Corp. APS Kristineberg 3 DK-2100 Copenhagen Ø Denmark
Finland	Digital Equipment Corp. OY PL16 SF - 02201 ESPOO 20 Finland
Norway	Digital Equipment Corp. A/S Pottenmakerveien 8 N - Oslo 5 Norway
Austria, East Germany, West Germany, Poland, Hungary, Rumania, Czechoslovakia, Russia, Bulgaria	Digital Equipment Corp. GMBH Wallsteinplatz 2 D - 8 Munich 40 West Germany
Israël	DECSYS Computers LTD. 4, Yirmiyahou Str. P.O. Box 6359 IL - Tel-Aviv 63505 Israël

Areas Covered	SPR Center
Greece, Portugal, Spain, Switzerland, Yugoslavia & Sina (Morocco, Algeria, Tunisia, Cyprus, Turkey, Malta)	Digital Equipment Corp. SA 9, route des Jeunes 1211 Geneva 26 Switzerland

DIGITAL EQUIPMENT CORPORATION, Corporate Headquarters: Maynard, Massachusetts 01754, Telephone: (617)897-5111—SALES AND SERVICE OFFICES: UNITED STATES—ALABAMA, Huntsville • ARIZONA, Phoenix and Tucson • CALIFORNIA, El Segundo, Los Angeles, Oakland, Ridgecrest, San Diego, San Francisco (Mountain View), Santa Ana, Santa Clara, Stanford, Sunnyvale and Woodland Hills • COLORADO, Englewood • CONNECTICUT, Fairfield and Meriden • DISTRICT OF COLUMBIA, Washington (Lanham, MD) • FLORIDA, Ft. Lauderdale and Orlando • GEORGIA, Atlanta • HAWAII, Honolulu • ILLINOIS, Chicago (Rolling Meadows) • INDIANA, Indianapolis • IOWA, Bettendorf • KENTUCKY, Louisville • LOUISIANA, New Orleans (Metairie) • MARYLAND, Odenton • MASSACHUSETTS, Marlborough, Waltham and Westfield • MICHIGAN, Detroit (Farmington Hills) • MINNESOTA, Minneapolis • MISSOURI, Kansas City (Independence) and St. Louis • NEW HAMPSHIRE, Manchester • NEW JERSEY, Cherry Hill, Fairfield, Metuchen and Princeton • NEW MEXICO, Albuquerque • NEW YORK, Albany, Buffalo (Cheektowaga), Long Island (Huntington Station), Manhattan, Rochester and Syracuse • NORTH CAROLINA, Durham/Chapel Hill • OHIO, Cleveland (Euclid), Columbus and Dayton • OKLAHOMA, Tulsa • OREGON, Eugene and Portland • PENNSYLVANIA, Allentown, Philadelphia (Bluebell) and Pittsburgh • SOUTH CAROLINA, Columbia • TENNESSEE, Knoxville and Nashville • TEXAS, Austin, Dallas and Houston • UTAH, Salt Lake City • VIRGINIA, Richmond • WASHINGTON, Bellevue • WISCONSIN, Milwaukee (Brookfield) • INTERNATIONAL—ARGENTINA, Buenos Aires • AUSTRALIA, Adelaide, Brisbane, Canberra, Melbourne, Perth and Sydney • AUSTRIA, Vienna • BELGIUM, Brussels • BOLIVIA, La Paz • BRAZIL, Rio de Janeiro and Sao Paulo • CANADA, Calgary, Edmonton, Halifax, London, Montreal, Ottawa, Toronto, Vancouver and Winnipeg • CHILE, Santiago • DENMARK, Copenhagen • FINLAND, Helsinki • FRANCE, Lyon, Grenoble and Paris • GERMAN FEDERAL REPUBLIC, Cologne, Frankfurt, Hamburg, Hannover, Munich, Nuremburg, Stuttgart and West Berlin • HONG KONG • INDIA, Bombay • INDONESIA, Djakarta • IRELAND, Dublin • ITALY, Milan, Rome and Turin • IRAN, Tehran • JAPAN, Osaka and Tokyo • MALAYSIA, Kuala Lumpur • MEXICO, Mexico City • NETHERLANDS, Utrecht • NEW ZEALAND, Auckland and Christchurch • NORWAY, Oslo • PUERTO RICO, Santurce • SINGAPORE • SPAIN, Madrid • SWEDEN, Gothenburg and Stockholm • SWITZERLAND, Geneva and Zurich • UNITED KINGDOM, Birmingham, Bristol, Epsom, Edinburgh, Leeds, Leicester, London, Manchester and Reading • VENEZUELA, Caracas •