

# digital Software Product Description

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PRODUCT NAME: TOPS-10 for DECsystem 2020, Version 6.03, Operating System

SPD 7.6.0

## DESCRIPTION:

*This Software Product Description describes the TOPS-10 monitor on the DECSYSTEM-2020. It should be noted that the functionality of the TOPS-10 monitor on a DECSYSTEM-2020 is not the full functionality of the TOPS-10 monitor on DECsystem-10. This is due to differences between the DECsystem-10 and DECSYSTEM-2020 communication hardware.*

Under control of TOPS-10, the DECSYSTEM-2020 can service a range of job types and response requirements, including any mix of timesharing and batch. TOPS-10 allocates memory, storage, peripherals, and processing time among system users, and has an installation-adjustable scheduler to control system operation. To service multiple users concurrently, the DECSYSTEM-2020 uses multi-programming and swapping. The monitor supports reentrant software; that is, only one copy of a reentrant language processor (or any reentrant program) need be memory-resident to serve multiple users simultaneously. The monitor performs all input/output, user communication, resource arbitration, and other necessary services.

### *TOPS-10 Timesharing:*

Depending on system configuration and total computing load, the DECSYSTEM-2020 can handle up to 32 terminals. The terminals can be CRTs and others which operate at speeds from 110 to 9600 baud.

The DECSYSTEM-2020s command language, file structure, I/O processing, and job scheduling are independent of the applications language used. In addition, standard software interfaces make it easy for a user to develop his own languages or systems. Editors, compilers, and interactive high-level debuggers shorten development time and increase programmer productivity.

### *TOPS-10 Batch:*

Batch on DECSYSTEM-2020 is designed for ease of use and flexible control over job processing. The command language for batch is an extension of the timesharing language, which allows easy movement between batch and interactive processing, and reduces the amount of training necessary to use the system effectively. An interactive user can prepare jobs and enter them into the batch input queue for processing. The user is allowed to specify the characteristics and limits associated with his batch job, and

can modify them as necessary. The system operator controls the batch system and specifies all operating parameters. The operator has the power to select or reject jobs, to suspend them, or to remove them from the batch system.

### *User Command Language:*

Through an easy-to-use command language, the user controls the running of his job. Specifically, he can:

- Compile, execute, and debug programs
- Create and edit files; list, append, and delete files
- Use available resources such as mag tapes, private disk packs, or other peripherals
- Communicate with the system operator and request such services as the mounting and dismounting of disk packs and magnetic tapes
- Start, suspend, or terminate his job
- Spool output to line printer
- Determine status of the system and the resources available
- Request time and resource accounting of his use of the system
- Send messages to other terminals in the system

### *TOPS-10 File Handling:*

File service for disk packs is designed for convenience and efficiency. Each user can have as many files as he desires on any of the available file storage devices. The system administrator establishes limits on the total amount of space each user's files can occupy. Each file is referred to by name, so that the user is not required to know where a file is physically located.

File storage is dynamically allocated during program operation, so there is no need to preallocate space before a file is established; however, preallocation may be done to guarantee the availability of space at some later time. Files can be shared concurrently (even with different access methods) among specified users through the use of protection codes. Updating a file is performed by either of two methods — superceding or updating in place.

*Virtual Memory* — (KI, KL and KS monitors only. Included with KS10 based systems):

On KI10, KL10 and KS10 processors, operating system support of virtual memory is provided. Thus the user can run programs with address space greater

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than the physical memory actually utilized and can take advantage of typical program characteristics to reduce memory demands for a program. A unique feature of DECSYSTEM-2020 virtual memory is that it exists as an option. The system administrator decides which users need the facility, and controls are provided to both the user and the administrator to allow them to tune the system to their needs.

#### *Error Handling:*

TOPS-10 has extensive error detection, logging, and recovery procedures for virtually all types of peripheral and memory failures. Error recovery provides system continuation and availability. Error logging provides the maintenance engineer and system administrator with valuable information regarding hardware failures, and aids in their diagnosis and correction.

#### *Utilities:*

The following is a list of TOPS-10 utility programs:

|           |  |
|-----------|--|
| BACKUP    | Disk/Magtape Save/Restore  |
| BATCON    | Batch Controller   |
| BOOTS     | Disk bootstrap loader  |
| BOOTM     | Magtape bootstrap loader   |
| COMPIL    | Invokes selected utilities (using Concise Command Language)                  |
| CREF      | Cross reference listing generator  |
| DAEMON    | Monitor extension utility  |
| DDT       | Interactive Debugging Program  |
| DIRECT    | Directory Lister   |
| FILCOM    | File Compare utility   |
| FILEX     | File Exchange utility  |
| HELP      | Provides interactive access to information on system facilities and commands |
| HELPER    | Program HELP file subroutine   |
| INITIA    | System and terminal line initialization utility                              |
| LINED     | Line-oriented interactive editor   |
| LINK-10   | Linkage editor and loader  |
| LOGIN     | Verifies and processes log-in procedure                                      |
| LOGOUT    | Removes a user from the system   |
| MACRO-10  | Macro assembler  |
| MAKLIB    | Binary file library maintenance utility                                      |
| MONGEN    | System Generation utility  |
| OMOUNT    | Processes operator device mount requests                                     |
| OPSER     | Allows multiple programs to be controlled from a single terminal             |
| PIP       | File Manipulation utility  |
| QUEUE     | Places entries in system queues  |
| REACT     | User profile system management utility                                       |
| SCDSET    | Scheduler control utility  |
| SETSRC    | Disk search list utility   |
| SPOOL     | Output device spooling utility   |
| SPRINT-10 | Card reader spooling utility   |

|        |  |
|--------|--|
| SYSERR | Generates reports from system error file |
| SYSINF | Interprocess communications controller   |
| SYSTAT | System status utility                    |
| TECO   | Interactive text editor                  |
| UMOUNT | Processes user device mount requests     |
| WTBOOT | Writes disk bootstraps                   |

The following utilities are distributed with TOPS-10. All have Category C support.

|          |        |
|----------|--------|
| AID      | MIC    |
| ALCFIL   | MONEY  |
| BLISS-10 | MONTST |
| CHKPNT   | MTCOPY |
| CREDIR   | PAL-10 |
| DELFIL   | PLEASE |
| DMPFIL   | QUOLST |
| DSKLST   | REATA  |
| DSKRAT   | REDALL |
| DTBOOT   | RUNOFF |
| DTCOPY   | SCRIPT |
| DUMP     | SOS    |
| FACTPR   | SOUP   |
| FAILSA   | SPACE  |
| FILDAE   | STRLIB |
| FUDGE    | SYSDPY |
| GLOB     | SYSERR |
| GRIPE    | TWICE  |
| KJOB     |        |

#### **MINIMUM HARDWARE REQUIRED:**

- DECsystem-10 with KS10 central processing unit, console terminal, and 192K words of memory
- RM03 or RP06 disk pack drive with controller
- TU45, 9-track magnetic tape transport with controller

#### **OPTIONAL HARDWARE:**

##### *Memories:*

Up to a system total of 512K words memory

##### *Disk Systems:*

- Up to eight RP06 or RM03 disk packs.

##### *Magnetic Tape Systems:*

- Up to four TU45 magnetic tape transports

##### *Punched Card Equipment:*

CD20 controller with:

- CD20-C 1200 cpm card reader
- CD20-A 300 cpm card reader

##### *Line Printers:*

LP20 controller with LP05 or LP14

##### *Terminals:*

Up to 32 LT33, LT35, LT37, LA30, LA36, LA37, VT05, VT06, VT50 or VT52 terminals

#### **PREREQUISITE SOFTWARE:**

None

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**OPTIONAL SOFTWARE:**

FORTRAN-10 (with FORDDT)  
 ALGOL-10  
 BASIC-10  
 COBOL 68 DEC-10  
 IQL Interactive Query Language  
 DBMS-10  
 SORT-10  
 APL-BASIC  
 APL-SF

**TRAINING CREDITS:**

10 — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

**SUPPORT CATEGORY:**

A — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

**UPDATE POLICY:**

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer without additional charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

**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 Agreement between Purchaser and DIGITAL.

*Standard Options*

TOPS-10 for DECSYSTEM-2020 is not available as a separate product. The following systems receive TOPS-10/2020 software as indicated:

2020            Single-use license, binaries, documentation, support services.

**ADDITIONAL SERVICES:**

The following key (F, M, P, Z) represents the distribution media for the product and must be specified at the end of the order number.

F = 7-track Magnetic Tape

M = 1600 bpi 9-track Magnetic Tape

P = 800 bpi 9-track Magnetic Tape

Z = No hardware dependency

QS910 -S— Per Call Consulting Service (media: Z)

QS920 -S— Monthly Consulting Service (media: Z)

QS922 -S— 6-Month Resident Consulting Service (media: Z)

QS924 -S— 12-Month Resident Consulting Service (media: Z)

QHK01 -K— Distribution Service (media: F, M, P)

QHK02 -K— Maintenance Service (media: F, M, P)

QHK14 -G— Software Notebook Update Service (requires QHK01 or QHK02) (media: Z)

QHK20 -G— Software Notebook (requires QHK01 or QHK02) (media: Z)

QHK10 -G— Additional Bulletin Subscription Service (requires QHK01 or QHK02) (media: Z)

QHK12 -G— Additional Dispatch Subscription Service (requires QHK02) (media: Z)

ADDENDUM  
SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

CATEGORY A

1. Upon notification by customer to the nearest DIGITAL office that the computer system, including all required prerequisite hardware and software, is ready for the installation of the SOFTWARE, DIGITAL will install such SOFTWARE in any location within the contiguous forty-eight (48) United States, the District of Columbia, or a country in which DIGITAL or a subsidiary of DIGITAL has a software service facility. The notification must be received by DIGITAL and the system must be ready for installation within thirty (30) days after the delivery of the SOFTWARE to customer or DIGITAL will have no obligation to install. Installation will consist of: (1) verification that all components of the SOFTWARE have been received by customer, (2) loading the SOFTWARE, and (3) executing a DIGITAL sample procedure.
2. During the ninety (90) day period after installation, if the customer encounters a problem with the current unaltered release of the SOFTWARE which DIGITAL determines to be a defect in the SOFTWARE, DIGITAL will provide the following remedial service (on site where necessary): (1) if the SOFTWARE is inoperable, apply a temporary correction (TC) or make a reasonable attempt to develop an emergency by-pass, and (2) assist the customer to prepare a Software Performance Report (SPR) and submit it to DIGITAL.
3. During the one (1) year period following installation, if the customer encounters a problem with the SOFTWARE which his diagnosis indicates is caused by a SOFTWARE defect, the customer may submit an SPR to DIGITAL. DIGITAL will respond to problems reported in SPRs which are caused by defects in the current unaltered release of the SOFTWARE via the Maintenance Periodical for the SOFTWARE, which reports SPRs received, code corrections, temporary corrections, generally useful emergency by-passes and/or notice of the availability of corrected code. Software Updates, if any, released by DIGITAL during the one (1) year period, will be provided to the customer on DIGITAL's standard distribution media as specified in the applicable SPD. The customer will be charged only for the media on which such updates are provided, unless otherwise stated in the applicable SPD, at DIGITAL's then current media prices.

CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

DIGITAL shall have the right to make additional charges for any additional effort required to provide services resulting from customer use of other than current unaltered release of the SOFTWARE, operated in accordance with the SPD.