

# Software Product Description

PRODUCT NAME: **MicroVMS Operating System, Version 4.7**

SPD 28.05.10

## DESCRIPTION

The MicroVMS Operating System supports the MicroVAX I, MicroVAX II, MicroVAX 2000, VAXstation I, VAXstation II, VAXstation II/GPX, and the VAXstation 2000. MicroVMS is fully compatible with VMS, and is built from the same source files as VMS. MicroVMS provides the same features as VAX/VMS on any other single VAX processor with the exception of compatibility mode. MicroVMS is VAX/VMS repackaged for the micro-computer environment. Note VMS Workstation Software is required in addition to MicroVMS in order to support the VAXstation I, II, II/GPX and 2000.

MicroVMS is suitable for both time-sharing and production environments. Time-sharing users can work interactively with the system and submit batch jobs. Jobs of all types including compute intensive, I/O intensive and real-time, in any mix, perform well on MicroVMS. The system permits an absolute limit of 8192 concurrent processes. However, the actual amount of work supported at one time with good performance depends on the types of processing being performed, as well as on physical memory and secondary storage available.

The MicroVAX architecture is a subset of the full VAX architecture, consequently some instructions are not implemented in the hardware. MicroVMS provides instruction emulation for all native VAX instructions not implemented in the MicroVAX hardware. This emulation is totally transparent to the user.

### Features

- User mode applications developed on VAX/VMS will run on MicroVMS without modification.
- MicroVMS is packaged in a modular fashion to allow optional pieces of the operating system to be installed, as needed by the user's application.
- Virtual memory management allows the writing of programs that are larger than physical memory, and lets any number of jobs share memory.
- User access to the system is by means of an easy-to-use command language. The Digital Command Language (DCL) is the standard command language available on MicroVMS and all VAX/VMS systems. This includes command-line editing and command recall.

- Extensive on-line help. Users can receive help by using the HELP command.
- EDT - DIGITAL's easy-to-use, flexible text editor
- VAXTPU - A programmable text editing utility
- DSR - Digital Standard Runoff, an easy-to-use text formatter
- Task-oriented documentation specifically written for the MicroVAX user. For full MicroVMS details users should refer to the VAX/VMS, Version 4.6 documentation set.

Other utilities include:

- BACKUP - To perform backup of local disk files to:
  - Local disk files
  - Local disk and tape save sets
  - Remote (network) disk save sets
- MAIL - To send mail messages to other users or to users on remote systems (requires optional DECnet-VAX for multi-node operation)
- PHONE - An interactive communication utility with networking capabilities (requires optional DECnet-VAX for multi-node operation)
- SORT/MERGE - For sorting and merging files. Available through DCL or from a program
- EXCHANGE - To transfer files from other DIGITAL operating systems
- Access Control Lists may be placed on files and devices to grant or deny access to individual users, groups of users, and to subsets of user groups.
- Security auditing may be enabled that will initiate an alarm message at security-enabled terminals when certain system events occur, such as modification of the user authorization file (UAF), login breakin attempts, certain file accesses and mounting of devices.

**Note:** DIGITAL does not warrant that the system is secure, although DIGITAL will fix any security problem that is brought to our attention in a future release of MicroVMS.

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*MicroVMS Packaging*

The MicroVMS Kit provides five components: the base or bootable system, Common Utilities, Secure User Environment, Program Development and System Programming Components, as well as documentation. The base system is required and provides a run-time only environment. This allows user programs developed on other VAX/VMS systems to be run on the MicroVAX. The Common Utilities component includes utilities not provided in the base system and the help files. The Secure User Environment component allows a system manager to closely control system resources by using access control lists and disk quotas.

The Program Development component contains utilities required for programming on MicroVMS and includes the macro assembler and debugger as well as other utilities and documentation. The System Programming component includes utilities needed either by a system programmer or a technical system manager. The user has the ability to install all of the utilities in each of the sub-options or may choose to install each utility separately.

*Error Logging Support*

MicroVMS only provides error logging support for the hardware devices supported by MicroVMS.

**MINIMUM HARDWARE REQUIRED**

MicroVAX (I or II), MicroVAX 2000, VAXstation (I or II), VAXstation II/GPX, or VAXstation 2000

A minimum MicroVAX I Computer System consists of:

- MicroVAX I processor
- One RD52-A 31 MB fixed Winchester disk
- One RX50-AA 2 x 400 KB diskette drive
- 2 MB memory
- Console terminal

A minimum MicroVAX II Computer System consists of:

- MicroVAX II processor
- One RD52 31 MB fixed Winchester disk or one RD53 71 MB fixed Winchester disk
- One RX50 2 x 400 KB diskette drive or one TK50 95 MB tape cartridge drive
- 2 MB memory
- Console terminal

A minimum MicroVAX 2000 Computer System consists of:

- MicroVAX chip-based CPU
- At least 4 MB memory
- Either one RX33 1.2 MB diskette drive or one TK50 95 MB tape cartridge drive
- Either one RD32 42 MB fixed Winchester disk or one RD53 71 MB fixed Winchester disk

- Console Terminal

A minimum VAXstation I workstation consists of:

- MicroVAX I processor
- One VCB01-KP graphics subsystem
- One RD52 31 MB fixed Winchester disk
- One RX50 2 x 400 KB diskette drive
- At least 3 MB memory
- VR100 19 inch monitor, VS10X-EA mouse and LK201 keyboard

A minimum VAXstation II workstation consists of:

- MicroVAX II processor
- One VCB01-KP graphics subsystem
- One RD52 31 MB fixed Winchester disk or one RD53 71 MB fixed Winchester disk
- One RX50 2 x 400 KB diskette drive or one TK50 95 MB tape cartridge drive.
- At least 3 MB memory
- VR260 19 inch monitor, VS10X-EA mouse or VSXXX-AB tablet and LK201 keyboard

A minimum VAXstation II/GPX workstation consists of:

- MicroVAX II processor
- One 4 plane VCB02-D or VCB02-B graphics co-processor
- One RD53 71 MB fixed Winchester disk
- One TK50 95 MB tape cartridge drive.
- At least 3 MB memory
- VR260 19 inch monitor or VR290 19 inch color monitor, VSXXX-AA mouse or VSXXX-AB tablet and LK201 keyboard

A minimum VAXstation 2000 workstation consists of:

- MicroVAX chip-based CPU with QVSS style graphics subsystem
- At least 4 MB memory
- Either one RX33 1.2 MB diskette drive or one TK50 95 MB tape cartridge drive
- Either one RD32 42 MB fixed Winchester disk or one RD53 71 MB fixed Winchester disk
- 19" Monochrome monitor, keyboard, mouse or tablet

MicroVMS system components have the following approximate disk block usage:

Base System:	10,200 blocks (5,222.4K bytes)
Common Utilities:	6,000 blocks (3,072K bytes)

Secure User Environment:	900 blocks (460.8K bytes)
Minimum Page File:	5,000 blocks (2,560K bytes)
Minimum Swap File:	1,000 blocks (512K bytes)
Program Development:	6,500 blocks (3,328K bytes)
System Programming:	3,000 blocks (1,536K bytes)

These block counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options selected.

### GROWTH CONSIDERATIONS

The minimum hardware requirements for any future version of this product may be different from the minimum hardware requirements for the current version.

### OPTIONAL Q-BUS HARDWARE

- DZV11 4-line serial terminal multiplexer
- DZQ11 4-line serial terminal multiplexer
- DHV11 8-line serial terminal multiplexer
- DHQ11 8-line serial terminal multiplexer
- One DEQNA Q-BUS Ethernet interface
- Up to 2 RC25, each RC25 consists of a 26 MB fixed Winchester disk and a 26 MB removable disk
- One RRD50 600 MB read only optical disk
- One DMV11 point-to-point DECnet Synchronous interface
- Additional memory

#### *MicroVAX I and VAXstation I Only:*

- One additional RD52 31 MB fixed Winchester disk or RD51 10 MB fixed Winchester disk (as a data disk only)

#### *MicroVAX II, VAXstation II, and VAXstation II/GPX Only:*

- Up to 16 MB of memory
- Up to 3 additional fixed Winchester disks, depending upon configuration, in any mix. Supported Winchester disks are the RD51 10 MB (as a data disk only), RD52 31 MB, RD53 71 MB, and RD54 159 MB
- TK50 95 MB tape cartridge drive
- TK70 296 MB tape cartridge drive
- RL02 10 MB removable disk
- LPV11 parallel line printer interface

**Note:** The RQDX disk controller supports up to 4 disk units. The RX50 counts as two units. Those

configurations that include an RX50 may only add one additional Winchester drive. The RQDX3 disk controller is required for the RD54 disk drive.

#### *MicroVAX II Only:*

- DRV11-WA General Purpose DMA Interface
- CXA16 16-line serial terminal multiplexer (no modem)
- CXB16 16-line serial terminal multiplexer (no modem) (RS422)
- CXY08 8-line serial terminal multiplexor (full modem)
- One KDA50 Q-BUS Disk Controller for any combination of RA60/80/81 disk drives, up to four drives per KDA50
- One TU81-Plus

#### *MicroVAX 2000 and VAXstation 2000 Only:*

- One additional RD53 71 MB fixed Winchester disk or one RD54 159 MB Winchester disk
- One TK50 95 MB tape cartridge drive
- One ThinWire Ethernet Adaptor

### TERMINAL SUPPORT

The following is the list of terminals that are supported and can interact with MicroVMS and its associated utilities: VT52, VT100, VT101, VT102, VT105, VT125, VT131, VT132, VT180, VT200 series (VT220, VT240 and VT241), VT300 series (VT330, VT340) and the Professional 350. The Rainbow 100 and DECmate II are supported in VT100 mode. In addition, the LA12, LA34, LA36, LA38, LA50, LA100, LA120 and LQP02 are supported in hardcopy mode.

### PREREQUISITE SOFTWARE

None

### OPTIONAL SOFTWARE

Refer to the VAX/VMS System Software Order Table (SPD 28.98.xx) for additional information on available optional software.

### SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

### INSTALLATION

This software product comes with installation directions and step-by-step documentation. You can purchase DIGITAL Installation Services which provide for the installation of the software product by an experienced DIGITAL Software Specialist.

### ORDERING INFORMATION

Single-Use licensed software 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 DIGITAL's copyright notice and any proprietary notices on the software) for use on that same CPU.

You will need a separate license for each CPU on which you will be using the software product (except as otherwise specified by DIGITAL). Then, Materials and Service Options are selected to utilize the product effectively. **THE LICENSE OPTIONS ARE DESCRIBED BELOW. IF YOU ARE NOT FAMILIAR WITH THE SERVICE OPTIONS, YOU MAY OBTAIN THE APPROPRIATE SOFTWARE PRODUCT SERVICE DESCRIPTION(S) FROM YOUR LOCAL DIGITAL OFFICE.** If you are already familiar with these options, you may obtain the ordering information directly from the Software Options Chart.

**LICENSE OPTIONS**

VAXstations are not eligible for the VMS license upgrades. The VMS single user license is the only valid license for a DIGITAL Workstation. No other VMS license is a valid license for a VAXstation.

**Single-Use License Option**

The Single-Use License is your right to use the software product on a single CPU.

For your first installation of this software product you must purchase as a **minimum**:

- Single-Use License Option, and
- Distribution and Documentation Option

The license gives you the right to use the software on a single CPU and the Distribution and Documentation Option provides the machine-readable software and related documentation.

To use this software product on additional CPUs, for each CPU you must purchase as a **minimum**:

- Single-Use License Option

In addition to the right to use, the license gives you the one-time right to copy the software from your original CPU installation to the additional CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

**Distribution and Documentation Option**

The Distribution and Documentation Option provides the machine-readable software and the basic documentation. You must have, or order, a Single-Use License to obtain this option. You will need this option to install the software for the first time. When revised versions of this software product become available, they may also be obtained by purchasing this option again.

**Software Revision Right-To-Copy Option**

The Right-To-Copy Option allows a customer with multiple CPUs to copy a revised version of a software product from one CPU to another. Each CPU must be licensed for that product. You first install the revised software on one CPU; then you can make copies for additional CPUs by purchasing the Right-To-Copy Option for each additional CPU.

**Documentation-Only Option**

The Documentation-Only Option provides one copy of the basic documentation.

**Software Product Services**

A variety of service options are available. For more information on these or other services, please contact your local DIGITAL office.

**SOFTWARE OPTIONS CHARTS**

The distribution Media Codes used in the Software Options Chart are described below. You specify the desired Media Code at the end of the Order Number, e.g., QN001-H3 = binaries on RX50 Diskette.

- 3 = RX50 Floppy Diskette
- 5 = TK50 Tape Cartridge
- Z = No hardware dependency

**Note:** The availability of these software product options and services listed on all the charts may vary by country. Customers should contact their local DIGITAL office for information on availability.

**Chart I  
MicroVAX I Systems**

OPTIONS	ORDER NUMBER
<b>LICENSE OPTIONS:</b> A LICENSE IS REQUIRED FOR EACH CPU.	
CPU License	QN001-UZ
<b>MATERIALS AND SERVICE OPTIONS:</b>	
Start-Up Service Package, Level III	QN001-B3
Start-Up Service Package, Level II	QN001-73
Start-Up Service Package, Level I	QN001-53

**Chart I (cont.)  
MicroVAX I Systems**

OPTIONS	ORDER NUMBER
Distribution and Documentation Option	QN001-H3
Software Revision Right-To-Copy Option	QN001-HZ
Documentation-Only Option	QZ001-GZ
Installation Service Option	QN001-I3
DECsupport Service	QN001-93
Basic Service	QN001-83
Self-Maintenance Service	QN001-33

**Chart II  
For MicroVAX II Systems**

OPTIONS	ORDER NUMBER 1-2 User	ORDER NUMBER 1-8 User	ORDER NUMBER 1-16 User	ORDER NUMBER 1-Unlimited User
<b>LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU.</b>				
Single-Use License	QZ001-CZ	QZ002-C3* QZ002-C5*	QZ003-C3* QZ003-C5*	QZ004-C3* QZ004-C5*
<b>MATERIALS AND SERVICE OPTIONS:</b>				
Start-Up Service Package, Level III	QZ001-B3 QZ001-B5	QZ002-B3 QZ002-B5	QZ003-B3 QZ003-B5	QZ004-B3 QZ004-B5
Start-Up Service Package, Level II	QZ001-73 QZ001-75	QZ002-73 QZ002-75	QZ003-73 QZ003-75	QZ004-73 QZ004-75
Start-Up Service Package, Level I	QZ001-53 QZ001-55	QZ002-53 QZ002-55	QZ003-53 QZ003-55	QZ004-53 QZ004-55
Distribution and Documentation Option	QZ001-H3 QZ001-H5	QZ002-H3 QZ002-H5	QZ003-H3 QZ003-H5	QZ004-H3 QZ004-H5
Software Revision Right-To-Copy Option	QZ001-HZ	QZ002-HZ	QZ003-HZ	QZ004-HZ
Documentation-Only Option	QZ001-GZ	QZ001-GZ	QZ001-GZ	QZ001-GZ
Installation Service Option	QZ001-I3 QZ001-I5	QZ002-I3 QZ002-I5	QZ003-I3 QZ003-I5	QZ004-I3 QZ004-I5
DECsupport Service	QZ001-93 QZ001-95	QZ002-93 QZ002-95	QZ003-93 QZ003-95	QZ004-93 QZ004-95
Basic Service	QZ001-83 QZ001-85	QZ002-83 QZ002-85	QZ003-83 QZ003-85	QZ004-83 QZ004-85
Self-Maintenance Service	QZ001-33 QZ001-35	QZ002-33 QZ002-35	QZ003-33 QZ003-35	QZ004-33 QZ004-35

\* Includes License and Key

**Chart III  
MicroVAX II Upgrade License**

OPTIONS	ORDER NUMBER
3-8 User Upgrade License and Key	QZ002-T3* QZ002-T5*
9-16 User Upgrade License and Key	QZ003-T3* QZ003-T5*
17-Unlimited User Upgrade License and Key	QZ004-T3* QZ004-T5*

**Chart IV  
MicroVAX 2000**

OPTIONS	ORDER NUMBER 1-4 User	ORDER NUMBER 1-8 User	ORDER NUMBER 1-16 User	ORDER NUMBER 1-n User
<b>LICENSE OPTIONS:</b> A LICENSE IS REQUIRED FOR EACH CPU.				
Single-Use License	Q3001-C3* Q3001-C5*	Q3002-C3* Q3002-C5*	Q3003-C3* Q3003-C5*	Q3004-C3* Q3004-C5*
<b>MATERIALS AND SERVICE OPTIONS:</b>				
Distribution and Documentation Option	Q3001-H3 Q3001-H5	Q3002-H3 Q3002-H5	Q3003-H3 Q3003-H5	Q3004-H3 Q3004-H5
Software Revision Right-To-Copy Option	Q3001-HZ	Q3002-HZ	Q3003-HZ	Q3004-HZ
Documentation-Only Option	Q3001-GZ	Q3001-GZ	Q3001-GZ	Q3001-GZ
Installation Service Option	Q3001-I3 Q3001-I5	Q3002-I3 Q3002-I5	Q3003-I3 Q3003-I5	Q3004-I3 Q3004-I5
Self-Maintenance Service	Q3001-33 Q3001-35	Q3002-33 Q3002-35	Q3003-33 Q3003-35	Q3004-33 Q3004-35

**Chart V  
MicroVAX 2000 Upgrade License**

OPTIONS	ORDER NUMBER
5-8 User Upgrade License	Q3002-CZ
9-16 User Upgrade License and Key	Q3003-T3* Q3003-T5*
17-Unlimited User Upgrade License and Key	Q3004-T3* Q3004-T5*

\* Includes License and Key

**Note:** MicroVAX 2000 has an integrated one year warranty. For further service information please contact your local service representative.

**Chart VI**  
**VAXstation I, VAXstation II, VAXstation II/GPX, VAXstation 2000**

VAXstations are not eligible for the VMS license upgrades. The VMS single user license is the only valid license for a DIGITAL Workstation. No other VMS license is a valid license for a workstation.

OPTIONS	VAXstation I VAXstation II/GPX ORDER NUMBER Single User	VAXstation II ORDER NUMBER Single User	VAXstation 2000 ORDER NUMBER Single User
<b>LICENSE OPTIONS:</b> A LICENSE IS REQUIRED FOR EACH CPU.			
Single-Use License	QQ001-UZ	Q4001-CZ	Q8001-CZ
<b>MATERIALS AND SERVICE OPTIONS:</b>			
Start-Up Service Package, Level III	N/A	Q4001-B3 Q4001-B5	N/A
Start-Up Service Package, Level II	N/A	Q4001-73 Q4001-75	N/A
Start-Up Service Package, Level I	N/A	Q4001-53 Q4001-55	N/A
Distribution and Documentation Option	QQ001-H3	Q4001-H3 Q4001-H5	Q8001-H3 Q8001-H5
Software Revision Right-To-Copy Option	QQ001-HZ	Q4001-HZ	Q8001-HZ
Installation Service Option	QQ001-I3	Q4001-I3 Q4001-I5	Q8001-I3 Q8001-I5
DECsupport Service	QQ001-93	Q4001-93 Q4001-95	N/A
Basic Service	QQ001-83	Q4001-83 Q4001-85	N/A
Self-Maintenance Service	QQ001-33	Q4001-33 Q4001-35	Q8001-33 Q8001-35

**Note:** VAXstation 2000 has an integrated one year warranty. For further service information, please contact your local service representative.

**Chart VII  
VAX Workstation Software  
VAXstation I, II, and II/GPX**

The distribution Media used in the Software Options Chart are described below. You specify the desired Media Code at the end of the Order Number, e.g., Q4A96-H5 = binary on TK50 Tape Cartridge. Note that VMS Workstation Software is required in addition to MicroVMS in order to support VAXstation I, II, II/GPX.

3 = RX50 Diskette

Z = No hardware dependency

5 = TK50 Tape Cartridge

OPTIONS	ORDER NUMBER VAXstation I	ORDER NUMBER VAXstation II VAXstation II/GPX (see note 2)	ORDER NUMBER VAXstation II VAXstation II/GPX
<b>LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU</b>			
Single-Use License	QQA96-UZ (see note 1)	Q4A96-UZ (see note 1)	QZA96-UZ
<b>MATERIALS AND SERVICE OPTIONS</b>			
Distribution and Documentation Option	QQA96-H3	Q4A96-H3 Q4A96-H5	QZA96-H3 QZA96-H5
Software Revision Right to Copy Option	QQA96-HZ	Q4A96-HZ	QZA96-HZ
Documentation-Only Option	QLA96-GZ	QLA96-GZ	QLA96-GZ
Installation Service Option	QQA96-I3	Q4A96-I3 Q4A96-I5	QZA96-I3 QZA96-I5
DECsupport Service	QQA96-93	Q4A96-93 Q4A96-95	QZA96-93 QZA96-95
Basic Service	QQA96-83	Q4A96-83 Q4A96-85	QZA96-83 QZA96-85
Self Maintenance Service	QQA96-33	Q4A96-33 Q4A96-35	QZA96-33 QZA96-35

**Chart VIII  
VAX Workstation Software  
VAXstation 2000**

<b>LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU</b>	
Single-Use License	Q8A96-UZ
<b>MATERIALS AND SERVICE OPTIONS</b>	
Distribution and Documentation Option	Q8A96-H3 Q8A96-H5
Software Revision Right to Copy Option	Q8A96-HZ
Documentation-Only Option	QLA96-GZ



**Chart VIII  
VAX Workstation Software  
VAXstation 2000**

Installation Service Option	Q8A96-13 Q8A96-15
DECsupport Service	Q8A96-93 Q8A96-95
Basic Service	Q8A96-83 Q8A96-85
Self Maintenance Service	Q8A96-33 Q8A96-35

NOTES:

1. For VAXstation packaged systems, the MicroVMS and VMS Workstation Software UZ licenses are included with the hardware system purchase.
2. The VAXstation II/GPX only supports TK50 distribution.
3. VAXstation 2000 has an integrated one year warranty. For further service information please contact your local service representative.