MicroVMS Release Notes, Version 4.5B

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This document provides supplemental information about the Version 4.5B MicroVMS software and the VAXstation 2000 and MicroVAX 2000 software documentation. It describes all changes to the software since Version 4.5. If you have not already done so, read the MicroVMS Version 4.5B Cover Letter, included with your documentation.

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Operating System and Version: MicroVMS Version 4.5B

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Preface

Intended Audience

This manual is intended for anyone who should know about new features, problems and restrictions, and changes to existing documentation for the VAXstation 2000 and MicroVAX 2000 systems. You should read this documentation before installing or upgrading to the Version 4.5B MicroVMS operating system on a VAXstation 2000 or MicroVAX 2000.

Structure of This Document

The *MicroVMS Release Notes, Version 4.5B* are arranged in three chapters that cover the following topics:

* Chapter 1 describes the differences between Version 4.5 and Version 4.5B.

* Chapter 2 discusses problems and restrictions.

* Chapter 3 provides notes to published documentation.

Associated Documents

The following hardware and software documents are associated with this manual:

* *MicroVMS VAXstation 2000/MicroVAX 2000 Installation Guide* describes how to install or upgrade the MicroVMS operating system on a VAXstation 2000/MicroVAX 2000.

* *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide* provides system management information for the VAXstation 2000/MicroVAX 2000.

* *MicroVMS User's Manual* provides an overview of the general use of the MicroVMS operating system.

- *VAXstation 2000 Hardware Installation Guide* provides information about installing and testing VAXstation 2000 hardware.

- *MicroVAX 2000 Hardware Installation Guide* provides information about installing and testing MicroVAX 2000 hardware.

- *VAXstation 2000 Owner's Manual* provides hardware operations and troubleshooting information for the VAXstation 2000.

- *MicroVAX 2000 Owner's Manual* provides hardware operations and troubleshooting information for the MicroVAX 2000.

- *VAXstation 2000, MicroVAX 2000, and VAXmate Network Guide* provides information about installing and maintaining a network environment on the VAXstation 2000/MicroVAX 2000.

Conventions Used in This Document

Conventions	Meaning
Key Names	VT200-series terminal key names appear first in text and examples in this guide. Key names that are different on the VT100-series terminal keyboard are shown in parentheses after the VT200-series key names.
RETURN Key	The RETURN key is not shown in formats and examples. Assume that you must press RETURN after typing a command or other input to the system unless instructed otherwise.
CTRL Key	The letters CTRL followed by a slash followed by a letter means that you must press the letter while holding down the CTRL key. For example, CTRL/Z means hold down the CTRL key and press the letter Z.
Lists	When a format item is followed by a comma and an ellipsis (, . . .), you can enter a single item or a number of those items separated by commas. When a format item is followed by a plus sign and an ellipsis (+ . . .), you can enter a single item or a number of those items connected by plus signs. If you enter a list (more than one item), you must enclose the list in parentheses. A single item need not be enclosed in parentheses.
Square Brackets	An item enclosed in square brackets ([ ]) is optional.
Key Symbols	In examples, keys and key sequences appear as symbols, such as PF2 and CTRL/Z .

Conventions	Meaning
Ellipses . . .	A vertical ellipsis indicates that part of the format or example is not shown. The missing text is irrelevant to the topic being discussed.
Delete Key	The key on the VT200-series terminal keyboard that performs the DELETE function is labeled ⟨X⟩ . The key on the VT100-series terminal keyboard that performs the DELETE function is labeled DELETE . Assume that DELETE in text and examples refers to the DELETE key on your terminal keyboard.
Examples	Examples show both system output (prompts, messages, and displays) and user input. User input is printed in red.

Chapter 1

Differences Between Version 4.5 and Version 4.5B

This chapter describes major changes in the MicroVMS operating system software since Version 4.5 that affect VAXstation 2000 and MicroVAX 2000 systems. For a list of changes to documentation, see Chapter 3.

1.1 VAXstation 2000/MicroVAX 2000 Device Support

MicroVMS Version 4.5B provides configuration support and includes drivers for standard and optional VAXstation 2000 and MicroVAX 2000 devices. The connectors and device controllers included on the VAXstation 2000/MicroVAX 2000 system boards are as follows:

- Four asynchronous serial ports
  - VAXstation 2000—LK201 keyboard, pointing device, modem, and printer
  - MicroVAX 2000—four general-user terminals
- A controller for a VR260 monochrome display (VAXstation 2000 only)
- A controller for disk mass storage, supporting the following options:
  - RX33 diskette drive
  - RD32 41Mb hard disk drive
  - RD53 69Mb hard disk drive
- A controller for a TK50 tape cartridge drive

In addition, an assortment of option boards are available to VAXstation 2000/MicroVAX 2000 systems, including the following:

- Additional memory
- A DESVA thinwire Ethernet controller

The devices that may be connected to an individual VAXstation 2000/MicroVAX 2000 system depend upon the system's particular configuration.

1.1.1 Configuring VAXstation 2000/MicroVAX 2000 Devices

The System Generation Utility (SYSGEN) connects devices, loads their drivers, creates the data structures by which the MicroVMS operating system and drivers coordinate their activities, and calls device initialization routines. In general, the system startup command procedure SYS$SYSTEM:STARTUP.COM invokes SYSGEN.

The STARTUP.COM command procedure includes a SYSGEN AUTOCONFIGURE ALL command. SYSGEN's autoconfigure facility thereupon examines its table of possible VAXstation 2000/MicroVAX 2000 devices (see Table 1–1), determines which devices are attached to the system, and configures existing devices using information from Table 1–1. (See also Section 2.2.)

DIGITAL strongly recommends that you accept the default behavior of the STARTUP.COM command procedure. In the event that you must exclude a specific device from being configured, you must first prevent the STARTUP.COM file from performing the autoconfiguration. To prevent autoconfiguration, set the SYSGEN parameter *NOAUTOCONFIG* to 1 by following these steps:

1. Log in to the system manager's account (SYSTEM). If the system manager menu is available, select option 1 to exit to DCL.

2. Enter the following command at the DCL prompt:

    ```
    $ RUN SYS$SYSTEM:SYSGEN
    ```

3. Enter the following commands at the *SYSGEN>* prompt:

    ```
    SYSGEN> USE CURRENT
    SYSGEN> SHOW NOAUTOCONFIG
    ```

    The following display appears:

Parameter Name	Current	Default	Minimum	Maximum	Unit	Dynamic
NOAUTOCONFIG	0	0	0	1	Boolean	D

4. Enter the following commands at the *SYSGEN>* prompt:

    ```
    SYSGEN> SET NOAUTOCONFIG 1
    SYSGEN> SHOW NOAUTOCONFIG
    ```

    The following display appears:

Parameter Name	Current	Default	Minimum	Maximum	Unit	Dynamic
NOAUTOCONFIG	1	0	0	1	Boolean	D

5. Enter the following command at the *SYSGEN>* prompt:

    ```
    SYSGEN> WRITE CURRENT
    ```

If you choose to prevent autoconfiguration, you should ensure that the base asynchronous serial ports are always autoconfigured. Enter the following command at the *SYSGEN>* prompt:

SYSGEN> AUTOCONFIGURE ALL/SELECT=TT:

Or you may enter the following command, making sure that you do not include "TT" in the list of device names:

SYSGEN> AUTOCONFIGURE ALL/EXCLUDE=(device-name[,...])

You can enter subsequent CONNECT statements with the appropriate *csr_addr* value for the command's /CSR qualifier, as shown in Table 1–1. These *csr_addr* values are actually offsets from the beginning of VAXstation 2000/MicroVAX 2000 I/O space, thus differing from the customary bus address value traditionally specified for UNIBUS devices in the CONNECT command.

Table 1–1   VAXstation 2000/MicroVAX 2000 Autoconfiguration Table

Device	Name	Driver	CSR (Offset)	No. of Vectors	First Vector	Vector Offset
Standard Serial Lines	TT	YEDRIVER	^X0800	2	^O300	4
ST506 Disk Controller	DU	DVDRIVER	^X0C00	1	^O774	—
TK50 Tape Controller	MU	TVDRIVER	^X0C80	1	^O770	—
Ethernet Controller	ES	ESDRIVER	^X4E00	1	^O120	—
Black & White Video Option	VC	VEDRIVER	^X5000	1	^O104	—

Examples of correct CONNECT commands for VAXstation 2000/MicroVAX 2000 devices include the following:

```
SYSGEN> CONNECT ESA0 /ADAP=0 /CSR=%X4E00 /VECT=%O120 /NUMV=01 /DRIVER=ESDRIVER
SYSGEN> CONNECT MUA0 /ADAP=0 /CSR=%X0C80 /VECT=%O770 /NUMV=01 /DRIVER=TVDRIVER
SYSGEN> CONNECT DUA0 /ADAP=0 /CSR=%X0C00 /VECT=%O774 /NUMV=01 /DRIVER=DVDRIVER
SYSGEN> CONNECT DUA1 /ADAP=0 /CSR=%X0C00 /VECT=%O774 /NUMV=01 /DRIVER=DVDRIVER
SYSGEN> CONNECT DUA2 /ADAP=0 /CSR=%X0C00 /VECT=%O774 /NUMV=01 /DRIVER=DVDRIVER
SYSGEN> CONNECT VCA0 /ADAP=0 /CSR=%X5000 /VECT=%O104 /NUMV=01 /DRIVER=VEDRIVER
```

To exit from SYSGEN, enter the following command at the *SYSGEN>* prompt:

SYSGEN> EXIT

WARNING: Use the CONNECT commands with extreme caution, as an incorrect command may cause the system to fail. Note that the "O" following the percent sign (%) in the /VECT argument is a capital letter O (abbreviation for octal), while all other 0's are zeros.

1.1.2 VAXstation 2000/MicroVAX 2000 I/O Space

Table 1–2 lists the physical addresses in VAXstation 2000/MicroVAX 2000 I/O space where existing and configured components can be found. The VAXstation 2000/MicroVAX 2000 initialization procedures map various regions of this address space. All values in Table 1–2 appear in hexadecimal radix.

MicroVMS defines symbols for VAXstation 2000/MicroVAX 2000 physical addresses in the macro $IO410DEF and for the respective offsets from the virtual address contained in EXE$GL_CPUNODSP in the macro $KA410DEF. Both of these macros reside in SYS$LIBRARY:LIB.MLB.

When using the offsets defined by the $KA410DEF macro in system code, you must first obtain the starting address of nodespace and use the symbolic offsets as displacements from that address. The following example illustrates this technique:

```
MOVL    G^EXE$GL_CPUNODSP,R0        ;Get starting address of nodespace
MOVB    KA410$B_INTMSK(R0),R1       ;Get interrupt mask register
```

Table 1–2   VAXstation 2000/MicroVAX 2000 Address Map

Physical Reference		Contents	Virtual Reference
Physical Address	Symbol	Description	Symbol
System Board Addresses			
00000000—001FFFFF	—	System board RAM	—
00200000—00FFFFFF	—	Memory option board RAM	—
	20020000	IO410$AB_CFGTST	Configuration and test register (on read) I/O reset register (on write)	KA410$B_CFGTST
20040000—2007FFFF	—	System board ROM	—
	20040004	IO410$AL_SIDEX	System ID extension register	KA410$L_SIDEX
20040020—2004003F	—	Interrupt vector numbers	—
	20080000	IO410$AL_HLTCOD	Halt code register	KA410$L_ HLTCOD
	20080004	IO410$AL_MSER	Memory system error register	KA410$L_MSER

Table 1-2 (Cont.)   VAXstation 2000/MicroVAX 2000 Address Map

Physical Reference		Contents	Virtual Reference
Physical Address	Symbol	Description	Symbol
System Board Addresses			
20080008	IO410$AL_MEAR	Memory error address register	KA410$L_MEAR
2008000C	IO410$AB_INTMSK	Interrupt mask register	KA410$B_INTMSK
2008000D	IO410$AB_VDCORG	Monochrome display origin	KA410$B_VDCORG
2008000E	IO410$AB_VDCSEL	Video interrupt select	KA410$B_VDCSEL
2008000F	IO410$AB_INTREQ	Interrupt request register (on read)	KA410$B_INTREQ
	IO410$AB_INTCLR	Interrupt request clear (on read)	KA410$B_INTCLR
20090000—2009007F	IO410$AB_NIADRS	Network address ROM	KA410$B_NIADRS
200A0000—200A000F	IO410$AW_SERCSR	Serial line controller	KA410$W_SERCSR
200B0000—200B00FF	IO410$AL_TODSEC	Time-of-year clock and non-volatile RAM	KA410$L_TODSEC
200C0000—200C0007	IO410$AB_DKCREG	Disk controller ports	KA410$B_DKCREG
200C0080—200C009F	IO410$AB_SCTLS	TK50 controller chip	KA410$B_SCTLS
200C00A0	IO410$AB_SCDADR	TK50 DMA address register	KA410$B_SCDADR
200C00C0	IO410$AW_SCDCNT	TK50 DMA byte count register	KA410$W_SCDCNT
200C00C4	IO410$AB_SCDDIR	TK50 DMA transfer direction	KA410$B_SCDDIR
200D0000—200D3FFF	IO410$AB_DKBUFS	Disk/tape data buffer RAM	KA410$B_DKBUFS
200F0000—200F003F	IO410$AW_VCCMD	Monochrome video cursor chip	KA410$W_VCCMD
30000000—3001FFFF	IO410$AB_VMEMS	Monochrome video RAM	—

Table 1–2 (Cont.)   VAXstation 2000/MicroVAX 2000 Address Map

| Physical Reference | | Contents | Virtual Reference |
Physical Address	Symbol	Description	Symbol
Option Board Addresses			
200E0000—200EFFFF	IO410$AW_NIRDP	Network option, signal NIENA	KA410$W_NIRDP
22000000—23FFFFFF	IO410$AB_PCCSR	Future option CSRs	KA410$B_PCCSR
24000000—25FFFFFF	IO410$AB_XCSR	Future option CSRs	KA410$B_XCSR
20100000—2013FFFF	IO410$AB_NIROMS	Network option ROM	KA410$B_NIROMS
20140000—2017FFFF	IO410$AB_VDROMS	Video option ROM	KA410$B_VDROMS
20180000—201BFFFF	IO410$AB_PCROMS	Additional option 1 ROM	KA410$B_PCROMS
201C0000—201FFFFF	IO410$AB_XROMS	Additional option 2 ROM	KA410$B_XROMS
38000000—3BFFFFFF	IO410$AB_VDCSR1	Video option (32-bit path)	KA410$B_VDCSR1
3C000000—3C00FFFF	IO410$AB_VDCSR2	Video option (16-bit path)	KA410$B_VDCSR2
Ethernet Network Option Board Addresses			
200E0000—200E0007	IO410$AW_NIRDP	DESVA registers	KA410$W_NIRDP
20100000—2011FFFF	IO410$AB_NIROMS	Firmware ROM	KA410$B_NIROMS

1.2   VAXstation 2000/MicroVAX 2000 Disk Driver

The VAXstation 2000/MicroVAX 2000 disk driver provides a certain amount of DIGITAL Storage Architecture (DSA) disk operation. In particular, the driver supports block revectoring and bad block replacement. This provides the system with a logically perfect disk medium.

Like other DSA disks, if a serious error occurs during a replacement operation, the disk is write locked to prevent further changes. This is done to preserve data integrity and minimize damage that could be caused by failing hardware. Unlike other DSA disks, there is no visible indication on the drive itself that this has occurred.

If this situation occurs, you will notice that the disk has become write protected. This may be visible in several ways:

- ERRFMT messages indicate that the disk is write locked.

- The disk enters mount verification and hangs.

- DCL command SHOW DEVICE output indicates that the disk is write locked.

- Error messages from programs and utilities attempt to write to the disk.

If the disk becomes write locked, you should use the following procedure:

1. Shut down the system.

2. Use standalone BACKUP to create a full backup of the disk.

3. Format the disk with the disk formatter.

4. Restore the disk from the backup using standalone BACKUP. Note that any files with sectors flagged with a forced error may be corrupted and need to be restored from a previous backup.

If errors ocurring during replacement operations becomes a chronic condition, call DIGITAL Field Service.

1.3 $GETSYI System Service, New Item Codes

The following item codes have been added to the $GETSYI system service:

SYI$_XCPU

When you specify the SYI$_XCPU item code, $GETSYI returns the extended CPU processor type of the node. The $GETSYI system service returns this information only for the local VAX node.

You should obtain the general processor-type value first by using the SYI$_CPU item code. For some of the VAX processor types, the $SYI_XCPU item code provides extended processor-type information. For other VAX processor types, the value that the SYI$_XCPU item code returns is currently undefined.

Because the processor type is a longword decimal number, the **buffer length** field in the item descriptor should specify 4 (bytes).

SYI$_XSID

When you specify SYI$_XSID, $GETSYI returns processor-specific information. For the MicroVAX chip-based systems, this information is the contents of the system-type register. The system-type register contains the full extended information used in determining the extended system-type codes. For other processors, the data that SYI$_XSID returns may be undefined.

Because the value of this register is a longword hexadecimal number, the **buffer length** field in the item descriptor should specify 4 (bytes).

The $PRDEF macro defines the symbols for the extended processor types. The current extended processor types available and their symbols are as follows:

VAX Processor Type Symbol	Extended Processor Type	Extended Processor Symbol
PR$_SID_TYPUV	MicroVAX II VAXstation II	PR$_XSID_UV_UV2
	MicroVAX 2000 VAXstation 2000	PR$_XSID_UV_410
PR$_SID_TYP8NN	VAX 8500	PRS$_XSID_N8500
	VAX 8550	PRS$_XSID_N8550
	VAX 8700	PRS$_XSID_N8700
	VAX 8800	PRS$_XSID_N8800

1.4   F$GETSYI DCL Lexical Function, New Items

The F$GETSYI lexical function has two new items:

* XCPU—returns CPU subtype. For example, the MicroVAX II, VAXstation II, and VAXstation II/GPX are CPU subtype 1. The VAXstation 2000/MicroVAX 2000 systems are CPU subtype 4. See Section 1.3.

    NOTE: All of these systems are CPU type 8, MicroVAX chip-based.

* XSID—returns the contents of the SYS_TYPE field. This is a CPU-dependent field. See Section 1.3.

1.5   F$GETSYI DCL Lexical Function and $GETSYI System Service

For the DCL lexical function F$GETSYI item code NODE_HWTYPE and the system service $GETSYI item code SYI$_NODE_HWTYPE, the VAXstation 2000/MicroVAX 2000 systems return the 4-byte ASCII string "2000".

1.6   DCL INITIALIZE Command

You use the /DENSITY=DOUBLE qualifier with the INITIALIZE command to specify RX33-mode formatting. Use this qualifier to format new RX33 diskettes. The only legal value for /DENSITY for RX33 drives is DOUBLE.

WARNING: Do not use this command to format RX50 diskettes. If you accidentally format an RX50 diskette, it is useless because it cannot be reformatted back to the RX50 format.

1.7   Dialing Up to a VAXstation 2000/MicroVAX 2000

The VAXstation 2000 and MicroVAX 2000 offer modem capability on terminal port TTA2. The user's manual that comes with the modem describes how to connect the modem to a telephone line and your system. To set the modem characteristic for the terminal port, enter the following command from any privileged account:

```
$ SET TERMINAL /PERM /MODEM /HANGUP /AUTOBAUD TTA2:
```

You must enter this command before attempting to dial in from a remote terminal.

1.8   The AUTOLOGIN Facility

MicroVMS is set up to log in serial lines TTA0 through TTA3 automatically to the USER account by means of the AUTOLOGIN Facility. Therefore, entering a carriage return from a terminal on one of these lines automatically logs you in to the USER account. If you want to change this behavior, log in to the SYSTEM account, and select option 8 of the system manager menu. If the system manager menu is not available, enter the following command at the DCL prompt ($):

```
$ @SYS$MANAGER:ALFMAINT
```

For more information about the AUTOLOGIN Facility, see the *MicroVMS User's Manual*, Section 2.1.2.

1.9   DESVA Ethernet/802 Controller

MicroVMS Version 4.5B supports a new Ethernet/802 controller, the DESVA. The DESVA is the Ethernet/802 controller that connects the VAXstation 2000 and the MicroVAX 2000 to the Ethernet. The device type of the DESVA controller is DT$_ES_LANCE. The DESVA controller is supported by the ESDRIVER. Its device name is **EScu**, where:

c   is the controller letter.

u   is the unit number.

The NCP LINE and CIRCUIT name for the DESVA controller is SVA-**controller number** (for example, SVA-0 for ESA0). Note that if the LAT terminal server is to use the DESVA, the DECnet DESVA line must be started first (see Section 2.5).

Chapter 2

Problems and Restrictions

This chapter describes problems and restrictions you may encounter when using Version 4.5B of the MicroVMS software with the VAXstation 2000/MicroVAX 2000 systems.

2.1 XDELTA System-Level Debugger

The VAXstation 2000 graphics video screen display normally turns itself off after a period of inactivity to extend the lifetime of the monitor. You can refresh the screen by pressing any key on the keyboard or by moving the mouse or tablet pointing device. However, if you run test software and encounter an XDELTA breakpoint while the screen is turned off, you must press the halt button on the back of the system box to refresh the screen. After halting the system, you should then continue normal activity by entering the CONTINUE console command.

2.2 Device Configuration

The MicroVAX 2000/VAXstation 2000 systems determine which mass storage devices (disks and magnetic tapes) are present at boot time. Unlike other VAX systems, this is a static determination performed when the system boots. After the system is booted, you cannot use the SYSGEN AUTOCONFIGURE command to automatically configure devices in an expansion box that were unplugged or powered off when the system was initialized.

After powering up or plugging in an expansion box, you can configure the respective devices by rebooting the system, or by entering the appropriate SYSGEN CONNECT command (see Section 1.1.1).

2.3   Error Logging Information

The CPU type register information is now logged as part of the SID field in the error log messages. However, it is not logged for the system SHUTDOWN and BUGCHECK messages, which contain only the SID contents.

DIGITAL expects to fix this in a future release that provides a new copy of the SYS.EXE file.

2.4   Recommendation to Start Error Logging on MicroVAX Systems

DIGITAL recommends that the error logging process always be started on a MicroVAX system, because the information contained in the error log is essential to DIGITAL Field Service personnel.

To start the error logger process automatically each time the system is bootstrapped, edit the site-specific startup procedure, SYS$MANAGER:SYSTARTUP.COM. Delete the comment delimiter character (!) from the following line:

`$! @SYS$SYSTEM:STARTUP ERRFMT`

For additional information, see the comments in the SYS$MANAGER:SYSTARTUP.COM file.

You may also start the error logger by logging in to a privileged account, such as SYSTEM, and entering the following DCL command at any time after the system is bootstrapped:

`$ @SYS$SYSTEM:STARTUP ERRFMT`

NOTE: To conserve disk space, managers of small MicroVAX configurations (less than 5,000 free blocks of disk storage) may not want to start up the error logger, or may want to regularly back up and delete error log files.

2.5   LAT Terminal Server

The LAT terminal server does not automatically recognize the DESVA controller. To use the DESVA controller with the LAT terminal server, add the following command to the SYS$MANAGER:SYSTARTUP.COM system startup command procedure before you invoke the LTLOAD command procedure:

`$ DEFINE/SYSTEM LAT$DEVICE ESA0`

DIGITAL expects to remove this restriction in a future release of MicroVMS.

2.6   The TK50 Tape Cartridge Drive

The following subsections describe restrictions and limitations that apply only to the TK50 tape cartridge drive.

2.6.1   System Page Table Requirements

In addition to the memory needed to load the device driver for the tape subsystem, 129 system page table entries are used. These additional system page table entries allow the driver to map the user's buffer directly for reading and writing. If your system is not configured to allow these additional system page table entries, you must create or modify the existing SYS$SYSTEM:MODPARAMS.DAT file to increase the current system page table parameter.

To increase the current SPTREQ parameter by 129, add the following line to the SYS$SYSTEM:MODPARAMS.DAT file:

```
ADD_SPTREQ=129
```

To change the SPTREQ parameter value and reboot the system, invoke AUTOGEN as follows:

```
$ @SYS$UPDATE:AUTOGEN SAVPARAMS REBOOT
```

If your system is not configured to allow the additional system page table entries, the tape is configured, but MUA0 is marked off line and is not available for use.

2.6.2   Limitation on the Size of Data Transfers

Because of the size of the VAXstation 2000/MicroVAX 2000 hardware buffer, records read from or written to the TK50 are limited to 12,288 bytes. DIGITAL expects to remove this restriction in a future release and to allow the VAXstation 2000/MicroVAX 2000 TK50 to be compatible with other tape drives in allowing transfers up to 65,535 bytes.

2.6.3   Datacheck Operations Not Supported

The VAXstation 2000/MicroVAX 2000 TK50 device driver ignores datacheck requests for both reading and writing operations. This applies to datacheck modifiers on individual $QIO system services, datacheck as a file attribute, and datacheck as a volume characteristic.

DIGITAL expects to support TK50 device drive error retry in a future release.

2.6.4 Spurious TK50 Microcode Messages

In early versions of the tape controller microcode, some tape operations may be cancelled only by way of a device reset. The device reset allows the tape driver to assume that the operation was aborted; however, the next operation may fail because the tape driver interprets the tape controller status as an error.

If you cancel a tape operation (for example, by pressing CTRL/Y followed by a STOP command), and then enter a command that accesses the tape, the following message may appear:

```
%SYSTEM-F-VOLINV, volume is not software enabled
```

If this message appears, you should ignore it and reenter the command that accessed the tape.

If this message appears in any situation other than when a tape operation has been cancelled, you should *not* ignore it, as it indicates that the drive status has changed.

DIGITAL expects to change this behavior in a future update to the TK50 microcode.

2.6.5 Error Retry Not Supported

The VAXstation 2000/MicroVAX 2000 TK50 device driver does not attempt to retry read or write operations that have failed. As a currently supported feature, the TK50 tape controller does attempt to retry read and write operations.

DIGITAL expects to support this feature in a future release.

2.6.6 Support for Read Reverse

The VAXstation 2000/MicroVAX 2000 TK50 device driver supports the IO$M_REVERSE (read block in reverse) modifier on $QIOs that read magnetic tape. However, the function must be simulated by TVDRIVER as backspacing one record, reading the record in the forward direction, and again backspacing one record. This means that, in the case of a data overrun, the first part of the block read is always returned, regardless of the IO$M_REVERSE modifier.

DIGITAL does not expect to change this behavior.

2.6.7 Support for the IO$M_ERASE $QIO modifier

The VAXstation 2000/MicroVAX 2000 TK50 device driver includes support for the IO$M_ERASE modifier on the logical and physical $QIO functions that write to the tape.

2.7 Bell Character Restriction

The BELL character cannot be transmitted to the operator window on the integrated graphic workstation screen of the VAXstation 2000. Therefore, you cannot receive audible notification of mail, system shutdowns, or any other BELL characters while logged in to this window. The BELL character works correctly on all other workstation windows, as well as on the operator console when it resides anywhere other than on the graphics workstation window.

DIGITAL does not expect to change this behavior.

2.8 Printing to an LA50 Hardcopy Terminal

If an LA50 hardcopy terminal is attached to the printer port of your system ($TERMINAL3), edit the SYS$MANAGER:SYSTARTUP.COM file, as follows:

- Remove the comment delimiter (!) from the following command line and replace *$TERMINAL0* with *$TERMINAL3*:

  ```
  $! DEFINE /SYSTEM $PRINTER $TERMINAL0  !if terminal
  ```

  The modified command line should look like this:

  ```
  $ DEFINE /SYSTEM $PRINTER $TERMINAL3   !if terminal
  ```

- Remove the two comment delimiters (!) from the following command lines, and remove the dollar sign ($) from the second command line. Do *not* change LA100 to LA50.

  ```
  $ ! SET TERMINAL $PRINTER /PERMANENT /NOBROADCAST /NOTYPEAHEAD /NOWRAP -
  $ !      /SPEED=(1200) /WIDTH=(132) /PAGE=(66) /DEVICE_TYPE=(LA100)
  ```

  The modified command lines should look like this:

  ```
  $  SET TERMINAL $PRINTER /PERMANENT /NOBROADCAST /NOTYPEAHEAD /NOWRAP -
         /SPEED=(1200) /WIDTH=(132) /PAGE=(66) /DEVICE_TYPE=(LA100)
  ```

  Ensure that the baud rate for the LA50 printer equals the speed defined in this SET TERMINAL command. For instructions, see the user's guide for the LA50 printer.

2.7   Bell Character Restriction

The BELL character cannot be transmitted to the operator window on the integrated graphic workstation screen of the VAXstation 2000. Therefore, you cannot receive audible notification of mail, system shutdowns, or any other BELL characters while logged in to this window. The BELL character works correctly on all other workstation windows, as well as on the operator console when it resides anywhere other than on the graphics workstation window.

DIGITAL does not expect to change this behavior.

2.8   Printing to an LA50 Hardcopy Terminal

If an LA50 hardcopy terminal is attached to the printer port of your system ($TERMINAL3), edit the SYS$MANAGER:SYSTARTUP.COM file, as follows:

- Remove the comment delimiter (!) from the following command line and replace *$TERMINAL0* with *$TERMINAL3*:

  ```
  $! DEFINE /SYSTEM $PRINTER $TERMINAL0  !if terminal
  ```

  The modified command line should look like this:

  ```
  $ DEFINE /SYSTEM $PRINTER $TERMINAL3   !if terminal
  ```

- Remove the two comment delimiters (!) from the following command lines, and remove the dollar sign ($) from the second command line. Do *not* change LA100 to LA50.

  ```
  $ ! SET TERMINAL $PRINTER /PERMANENT /NOBROADCAST /NOTYPEAHEAD /NOWRAP -
  $ !      /SPEED=(1200) /WIDTH=(132) /PAGE=(66) /DEVICE_TYPE=(LA100)
  ```

  The modified command lines should look like this:

  ```
  $   SET TERMINAL $PRINTER /PERMANENT /NOBROADCAST /NOTYPEAHEAD /NOWRAP -
           /SPEED=(1200) /WIDTH=(132) /PAGE=(66) /DEVICE_TYPE=(LA100)
  ```

  Ensure that the baud rate for the LA50 printer equals the speed defined in this SET TERMINAL command. For instructions, see the user's guide for the LA50 printer.

Chapter 3

Notes to Published Documentation

This chapter describes additions, omissions, and errors in existing documentation pertaining to MicroVMS Version 4.5B and the VAXstation 2000 and MicroVAX 2000 systems. Changes and corrections are given by chapter, section, and line. Please refer to the indicated portions of text in the listed manuals and note the changes.

3.1 Corrections to the *MicroVMS User's Manual*

The following subsections describe corrections to the *MicroVMS User's Manual*, Version 4.4.

3.1.1 Appendix DCL

Make the following changes to the description of the INITIALIZE command in Appendix DCL.

On page DCL–70, the information in the first paragraph on the /DENSITY qualifier now reads as follows:

> For floppy disk volumes that are to be initialized on RX02 dual-density disk drives, specifies the density at which the floppy disk is to be formatted.

The sentence should read as follows:

> For floppy disk volumes that are to be initialized on RX02 dual-density diskette drives or RX33 diskette drives, specify the density at which the floppy diskette is to be formatted.

Add the following information to the end of the explanation of the /DENSITY qualifier:

> RX33 drives allow the formatting of RX33 media. To format RX33 media, specify the density value DOUBLE.

> **WARNING:** RX50 media is not designed to be formatted. Do not attempt to format or reformat RX50 media.

3.1.2 Appendix LEX

On page LEX–20, add the following information to the F$GETSYI item:

Item	Information Returned and Data Type
XCPU	Returns the CPU subtype as an integer.
XSID	Returns the SYS_TYPE value for this system as an integer.

3.2 Correction to the *MicroVMS VAXstation 2000/MicroVAX 2000 Installation Guide*

Note the following correction to Section 2.4 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Installation Guide*.

Section 2.4 refers to the MicroVMS Version 4.5B base kit, consisting of 15 diskettes labeled *MicroVMS V4.5B BASE 1/15* through *MicroVMS V4.5B BASE 15/15*.

The MicroVMS Version 4.5B base kit now consists of 16 diskettes labeled *MicroVMS V4.5B BASE 1/16* through *MicroVMS V4.5B BASE 16/16*. You *must* install all 16 diskettes of the base system kit.

3.3 Addition to the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*

Add the following new section to the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

3.7.5 Using Standalone BACKUP to Restore to the Booted System Disk

If you previously built standalone BACKUP in the alternate system root directory SYSE, it is possible for you to back up and restore the contents of the system disk on which standalone BACKUP resides. This is possible because when standalone BACKUP is booted on a system with 2 or more megabytes of main memory, standalone BACKUP is moved to main memory, and no longer requires access to the disk from which it was booted.

If your system has 2 megabytes or more of memory, and you built standalone BACKUP in the alternate system root directory SYSE, there are only two circumstances under which you need to boot standalone BACKUP from removable media:

- To install MicroVMS on a blank (new) disk

- To recover from any significant disk-related errors

To back up and restore the contents of the system disk using standalone BACKUP in SYSE, follow these steps:

1. Shut down the system by following the procedure in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

2. Bootstrap standalone BACKUP by entering the following command at the console-mode prompt (> > >):

   >>> B/E0000000 ddcu

   where:

   ddcu: is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

- To back up the contents of the system disk to a tape cartridge, enter the following command at the dollar sign ($) prompt:

  $ BACKUP/IMAGE ddcu: MUA0:saveset.BCK

  where:

ddcu:	is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_15_1987.BCK.

  NOTE: If your system has less than 2 megabytes of memory, you receive the following message from standalone BACKUP:

  Small memory system. Booted device must stay online during operation.

  To restore the contents of the disk, enter the following command at the dollar sign ($) prompt:

  $ BACKUP/IMAGE MUA0:saveset.BCK ddcu:/INITIALIZE

  where:

ddcu:	is the physical device name of the system disk to which you restore the backup, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you chose as part of the backup procedure.

- To back up the contents of the system disk to diskettes, enter the following command at the dollar sign ($) prompt:

  $ BACKUP/IMAGE ddcu: DUA2:saveset.BCK/SAVE_SET

  where:

ddcu:	is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_15_1987.BCK.

NOTE: If your system has less than 2 megabytes of memory, you receive the following message from standalone BACKUP:

```
Small memory system.  Booted device must stay online during operation.
```

To restore the contents of the disk, enter the following command at the dollar sign ($) prompt:

```
$ BACKUP/IMAGE DUA2:saveset.BCK ddcu:/INITIALIZE
```

where:

ddcu:	is the physical device name of the system disk to which you restore the backup, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you chose as part of the backup procedure.

3. Halt the system by pressing the halt button on the back of the system box.

4. Bootstrap the system by entering the following command at the console-mode prompt ($>$ $>$ $>$):

```
>>> B ddcu
```

where:

ddcu:	is the physical device name of the system disk to which you restore the backup, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

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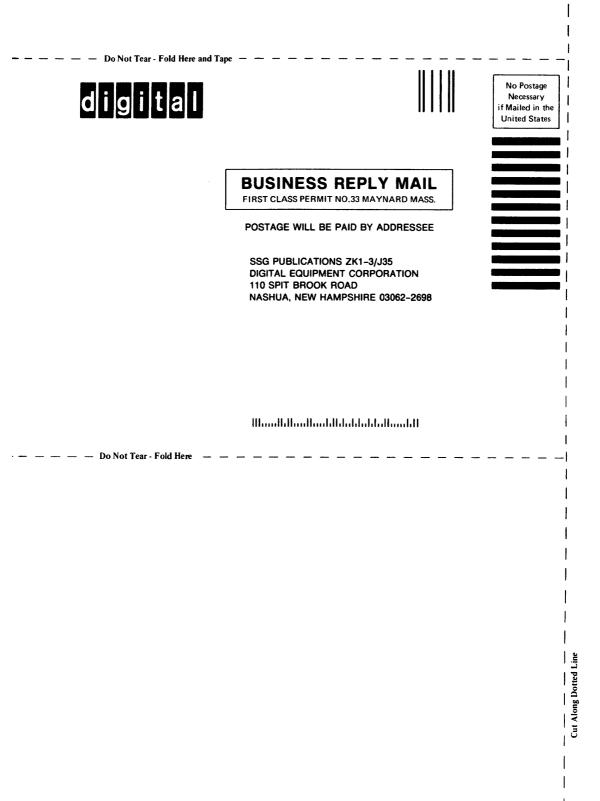
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