VAX 4000
Model 500A/505A/600A/700A/705A

Troubleshooting and Diagnostics

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Preface

Troubleshooting is the process of isolating and diagnosing problems. When your system does not operate as described in your *Operation* manual, use the information in this manual to isolate and diagnose the problem.

This manual contains three chapters and two appendixes:

- Chapter 1 lists problems you may experience at power-up and provides corrective actions.

- Chapter 2 lists problems you may experience during normal operation and provides corrective actions.

- Chapter 3 tells you how to run the MicroVAX Diagnostic Monitor (MDM), a diagnostic tool you can use to test your system periodically or to isolate a particular problem.

- Appendix A contains illustrations showing the location of your system controls and indicators.

- Appendix B describes how to write-protect your EF/RF-Series ISE.

If the corrective actions suggested in Chapters 1 and 2 do not solve the problem, call your Digital Services representative.

The following conventions are used in this manual.

Convention	Meaning
Key	A terminal key used in text and examples. For example, Break indicates that you press the Break key on your terminal keyboard.
Ctrl/C	Hold down the Ctrl key while you press the C key.
NOTE	Provides general information about the current topic.
CAUTION	Provides information to prevent damage to equipment or software.

1

Troubleshooting During Power-Up

After you turn on your system, the processor performs a series of self-tests and startup routines. After successful completion of the self-tests, if the Break Enable/Disable switch is set to disable (down), your system autoboots system software.

1.1 Autobooting the System Software

Your system boots automatically (autoboots) from a specified drive if you have specified a boot device by way of the command SET BOOT device-name from console mode. Your system continues to boot from the specified drive each time it is turned on, until you specify a different device by entering the SET BOOT device-name command again.

Your system stores the following console parameters in nonvolatile memory.

Parameter	Values	Comment
Language	1 - 15	Sets the language and the keyboard type used under the console
ControlP	0,1 (disabled,enabled)	Sets ControlP as a halt condition instead of a break, if the break enable switch is set for enable.
Halt	0 - 4 (or DEFAULT, RESTART, REBOOT, HALT, RESTART_ REBOOT)	Defines the action on halt
DSSI_ID Bus 0/A	0 - 7	The DSSI node ID for the CPU DSSI adapter 0
DSSI_ID Bus 1/B	0 - 7	The DSSI node ID for the CPU DSSI adapter 1

Parameter	Values	Comment
DSSI_ID Bus 2/C	0 - 7	The DSSI node ID for the CPU DSSI adapter 2
DSSI_ID Bus 3/D	0 - 7	The DSSI node ID for the CPU DSSI adapter 3
BFLG	Hex number up to 8 digits	Sets the default R5 boot flag
BOOT	Boot device	Sets the default boot device

If ac power is lost, this information is retained. When ac power is restored, type **SHOW SAVED_STATE** at the >>> prompt. Your system displays these parameters with the values they had at the time of the ac power loss. You can then change any of these values. To boot your system, type **B** at the >>> prompt.

If you do not enter the SET BOOT device-name command, your system boots from the Ethernet port, EZA0.

1.2 Troubleshooting Power-Up Problems

Refer to the descriptions of problems and corrective actions in the following sections. If the action(s) listed do not solve the problem, call your Digital service representative.

1.2.1 Problems During Self-Tests

Problem	Possible Cause	Corrective Action
No response when Power switch turned on; AC Present indicator not lit.	System not plugged in.	Set Power switch to 0. Plug in system. Set Power switch to 1.
	No power at wall outlet.	Use different wall outlet or check circuit breaker controlling power to wall outlet.
	Power switch (circuit breaker) tripped (in position 0).	Wait 1 minute, then set Power switch to position 1. If it trips again, call your Digital Services representative.
	Power cable incorrectly installed.	Set Power switch to 0. Check that cable is fully seated in socket. Set Power switch to 1.

Problem	Possible Cause	Corrective Action
AC Present indicator lit; DC OK indicator not lit.	Power Control Bus cable connected to Secondary In (SI) connector on power supply.	Turn on system or expander connected to Power Bus Out (MO) connector on power supply.
	BA400-series expander not turned on.	Turn on expander.
	Power supply or module failure.	Call your Digital Services representative.
System has power; AC Present and DC OK indicators lit; nothing displays on console terminal.	Console terminal off.	Turn on console terminal.
	Console terminal off line.	Put terminal on line as described in terminal document.
	Hold key activated.	Deactivate hold key.
	Console terminal cable incorrectly installed.	Make sure cable is installed properly at both ends.
	Console terminal setup not done correctly.	Reread setup instructions in terminal manual.
	Baud rate of system and terminal do not match.	Set terminal baud rate to match system rate.
	Power-Up Mode switch on console module set to T.	Set that switch to Run (indicated by arrow).
	Terminal defective.	Turn off terminal and turn it on again. If it fails self-tests, call your Digital Services representative.
	If printer connected to obtain copy of console interaction, fault in printer.	Turn off printer and turn it on again. If it fails self-tests, call your Digital Services representative.
	Problem in CPU.	Call your Digital Services representative.
System has power; DC OK indicator lit; nothing displays on console terminal; LED on console module displays E or F.	Problem in CPU.	Call your Digital Services representative.

Problem	Possible Cause	Corrective Action
Self-tests halt; error message or error summary displays on console terminal.	System detected error while running self-tests.	Copy number following question mark in error message or summary and call your Digital service representative.
Language Selection Menu does not appear.	Baud rate on console terminal different from baud rate on system.	Check that baud rate on console terminal agrees with system rate.
	Terminal does not support multinational character set (MCS).	Obtain terminal that supports MCS, or use the default language (English). If this is not a problem continue.

1.2.2 General Problems During Boot Sequence

Problem	Possible Cause	Corrective Action
System returns to BOOT prompt after 4 minutes.	Sanity timer enabled on DESQA module.	Disable sanity timer as described in *DESQA Option Installation Guide*.
>>> displays on console terminal.	Break Enable/Disable switch set to enable (up); system in console mode.	To autoboot, set Break Enable /Disable switch on console module to disable (down). Reset system by pressing Restart button on system control panel. To boot manually from console mode, use BOOT device-name command.
>>> displays on console terminal; Break Enable /Disable switch set to disable (down).	User-defined halt action set to HALT.	From console mode, enter SET HALT DEFAULT command.
?54 RETRY displays twice on console terminal.	No bootable medium found.	See actions listed for boot device in subsequent sections.
Countdown does not continue from 2 through 0; Break Enable/Disable switch set to disable (down).	System cannot load software from disk drive, tape drive or Ethernet.	See actions listed for boot device in subsequent sections.

1.2.3 Problems Booting from an EF/RF-Series Integrated Storage Element (ISE)

Problem	Possible Cause	Corrective Action
Countdown continues from 2 through 0; console terminal displays operating system error messages; Write-Protect button in (glows orange). For EF/RF ISEs, `Mounted wrtlck` displays when DCL command SHOW DEVICE DI is issued.	System disk write-protected.	Push in and release Write-Protect button to out (unlit) position. Make sure Write-Protect button corresponds to system disk. For EF/RFs, remove Write-Protect per Appendix B.
Countdown continues from 2 through 0; console terminal displays console error messages.	System disk contains no bootable software.	Install system software.
Countdown does not continue from 2 through 0; Break Enable/Disable switch set to disable (down); Run/Ready button out.	System disk off line.	Press Run/Ready button to in position. Press Restart button on system control panel.
Fault indicator lit or blinking.	Problem in controller or ISE.	If Fault indicator stops blinking, system may have corrected itself. Run MDM as described in Chapter 3. If Fault indicator remains lit, call your Digital Services representative.
	Bus node ID plug not installed.	Install unique Bus node ID plug.

1.2.4 Problems Booting from a Tape Drive

Problem	Possible Cause	Corrective Action
Countdown does not continue from 2 to 0 or system boots from another device (wrong software displays on console terminal).	No tape cartridge in tape drive.	Insert cartridge containing system software into tape drive.
	Fixed disk on line.	Place fixed disk off line.
	Tape not bootable (does not contain bootstrap program).	Use bootable tape to start system software.
	Tape worn or damaged.	Try another tape cartridge.
	Problem in controller or tape drive.	Call your Digital Services representative.

2

Troubleshooting During Normal Operation

Problems that occur during normal operation of your system may result from a system defect, faulty setting, or incorrect procedure.

The following sections list problems, possible causes, and corrective actions. If the action(s) listed do not solve the problem, call your Digital Services representative.

2.1 System Problems

Problem	Possible Cause	Corrective Action
System has power; DC OK indicator lit; nothing displays on console terminal; LED on console module displays E or F.	Problem in CPU.	Call your Digital Services representative.
System loses power; AC Present indicator not lit.	System not plugged into wall outlet.	Set Power switch to 0. Plug in system. Set Power switch to 1.
	No power at wall outlet.	Use different wall outlet or check circuit breaker controlling power to wall outlet.
	Power cable incorrectly installed.	Set Power switch to 0. Check that cable is seated in socket. Set Power switch to 1.
System loses power; DC OK indicator not lit.	Power supply failed.	Turn off system and call your Digital Services representative.
System loses power; Power switch off (position 0).	Power switch (circuit breaker) tripped.	Wait 1 minute, then set Power switch to 1. If it trips again, call your Digital Services representative.

Problem	Possible Cause	Corrective Action
Alarm sounding and Over Temperature Warning indicator flashing.	Systems internal temperature rising and approaching maximum limit.	Make sure that the system air vents are not blocked. Keep system away from heat sources, Check room temperature per your Site Preperation manual.
Over Temperature Condition indicator lit; system loses power; Power switch on (position 1).	System shut down to prevent overheating.	Make sure vents are clear, system is not near heat source, and room temperature is within guidelines in *Site Preparation* manual. Then set Power switch to 0. Wait 5 minutes. Set Power switch to 1. If system shuts down again, call your Digital Services representative.
System loses power; Fan Failure indicator lit; Power switch on (position 1).	One or two fans failed.	Call your Digital Services representative.
System halts; >>> displayed on console terminal.	Break or Ctrl/P pressed.	Type C and press Return . To prevent recurrences, set Break Enable/Disable switch to disable (down) and press Run/Ready button to restart system. Pressing Restart button reboots system.
Terminal display halts.	Hold Screen key on terminal pressed.	Press Hold Screen key again.
	Terminal data cable disconnected.	Reconnect data cable.
System reboots.	Restart button pressed.	Let rebooting complete. To prevent recurrences, ask your Digital Services representative to disable Restart button.
For DSSI configuration: performance degrades, operating system crashes, or `Closed Virtual Circuit` or `Closing Virtual Circuit` displays on console terminal.	Ground offset voltage between enclosures exceeds limit listed in system *Installation* manual.	Make sure site power distribution system does not have any grounding faults listed in system *Site Preparation* manual. Then measure ground offset voltage(s) as described in system *Installation* manual.
		Make sure ground cable connects any two enclosures sharing common DSSI bus.

Problem	Possible Cause	Corrective Action
	Loose or missing DSSI terminators.	Make sure terminators are installed properly.
	Damaged DSSI cable or cable connector.	Replace cable.
	DSSI bus length exceeds limit specified in *DSSI VMScluster Installation and Troubleshooting* manual.	Call your Digital Services representative.
	Non-Digital device connected to DSSI bus.	Call your Digital service representative.

2.2 EF/RF-Series Integrated Storage Element (ISE) Problems

Problem	Possible Cause	Corrective Action
Write error message displayed; Write-Protect button glows orange. For EF/RF ISEs, `Mounted wrtlck` displays when DCL command SHOW DEVICE DI is issued.	ISE write-protected.	Press and release Write-Protect button. For EF/RF, remove Write-Protect per Appendix B.
Fault indicator lit or blinking.	Bus node ID plug not installed.	Install that plug.
	Two or more devices have same node ID on same bus.	Make sure all devices and controllers or adapters on same bus have unique IDs.
	Problem in controller or ISE.	If Fault indicator stops blinking, system may have corrected itself. Run MDM as described in Chapter 3. If Fault indicator remains lit, call your Digital service representative.
Read error message displayed; Run/Ready button out.	ISE not spun up.	Press Run/Ready button to in position. After green indicator lights, ISE is available for use.

2.3 RRD3 Compact Disc Drive Problems

Problem	Possible Cause	Corrective Action
The drive does not accept the disc.	The disc is upside-down in the tray or it is not placed correctly in the tray.	Remove the disc from the tray and reinsert it properly.
	A disc is already present.	Remove the disc and replace it with a new one.
The eject button fails to release the disc tray.	The eject button is disabled by software.	Reenable the eject button or manually release the disc tray.
	The system does not have power.	Set the system unit on/off switch to the on (|) position and press the eject button again.
	The RRD43 compact disc drive is faulty.	If you want to release the disc tray manually, see *MicroVAX 3100 Model 85/95 Operator Information* for instructions. If the problem persists, contact your Digital services representative.

2.4 TF-Series Tape Drive Problems

Problem	Possible Cause	Corrective Action
Tape not software write-enabled.	Drive not loaded, or unloaded by software.	Load drive. Ensure that yellow indicator is lit.
	Cartridge has TK50 or TK70 format (drive cannot write to those devices).	Use cartridge with correct format.
	Bad cartridge or improperly written calibration tracks.	Try another cartridge.
	Software operating system error.	Reboot operating system.
	Problem in drive.	Call your Digital Services representative.
Does not mount or read /write.	Problem in cartridge.	Try another cartridge.
	Dirty read/write heads.	Use yellow head-cleaning cartridge.
Orange Use Cleaning Tape light lit.	Dirty read/write heads.	Use yellow head-cleaning cartridge.
Four lights blinking.	Failed self-test or detected hard error.	Push Unload button. If lights continue blinking, call your Digital Services representative.
Green light on; yellow light not lit.	Cartridge load error.	Try another cartridge. If problem persists, call your Digital Services representative.
Cartridge stuck in drive; tape on takeup reel.	Hard drive error.	Press Unload button. If problem persists, call your Digital Services representative.
Cartridge does not load.	Mispositioned leader.	Try another cartridge.

2.5 TK50 Tape Drive Problems

Problem	Possible Cause	Corrective Action
Red light blinking; no unusual sounds.	Problem in drive.	Press Load/Unload button four times. If problem persists, do not use drive or remove cartridge. Call your Digital Services representative.
Red light blinking; whirring sound.	Tape leader not coupled properly.	Turn off system. Do not remove cartridge. Call your Digital Services representative.
Cartridge release handle does not move.	Self-test in progress.	Press Unload button and wait for red light to go out and green light to remain on. Then try again.
	Drive active.	Press Unload button and wait for red light to go out and green light to remain on. Then try again.
Cartridge release handle does not lock.	Cartridge not inserted properly.	Reinsert cartridge. If problem persists, call your Digital Services representative.
Cartridge does not unload.	Load/Unload button in load (in) position.	Press button to unload (out) position. Wait for red light to go out and green light to remain on before trying to remove cartridge.
	Load/Unload button not working properly.	Press button to load (in) position, wait a few seconds, then press button to unload (out) position. After red light goes off and green light comes on, move cartridge release handle. If problem persists, call your Digital Services representative.
Passes self-test; does not work.	Problem in controller or connection between drive and controller.	Call your Digital service representative.

2.6 TK70 Tape Drive Problems

Problem	Possible Cause	Corrective Action
Green light blinking after tape insertion.	Tape leader defective.	Pull handle open and remove cartridge. Use another cartridge.
Orange, yellow, and green lights blinking.	Problem in drive.	Press Unload button once. If orange and green lights go out and yellow light starts blinking, cartridge is unloading. After green light comes on and you hear beep, remove cartridge. If three lights start blinking after you press Unload button, fault is not cleared. Do not remove cartridge. Call your Digital Services representative.
Handle does not move.	Self-test in progress.	Do not move handle while yellow light is on. Press Unload button and wait for orange and yellow lights to go off and green light to remain on. Then try again.
	Drive active.	Do not move handle while yellow light is on. Press Unload button and wait for yellow light to go off and green light to remain on. Then try again.
Handle does not lock.	Cartridge not inserted properly.	Reinsert cartridge. If problem persists, call your Digital Services representative.
Cartridge does not unload.	Unload button not working properly.	Unload cartridge with command described in your system software manuals.
Passes self-test; does not work.	Problem in controller or connection between drive and controller.	Call your Digital Services representative.

2.7 TLZ07 Cassette Tape Drive and Autoloader Problems

The embedded TLZ07 is only supported when the HSD05 DSSI-to-SCSI bus adapter option is installed in the system backplane. For more information about HSD05 and supported devices, see *HSD05 DSSI–to–SCSI Bus Adapter Operation Information for BA400–Based VAX 4000 Systems*.

Problem	Possible Cause	Corrective Action
Unable to back up or copy data to cassette tape.	Cassette write-protected.	Set write-protect tab on cassette to write-enabled.
	No tape in drive.	Insert tape.
Write-Protect LED flashes amber.	Excessive tape errors.	Perform head cleaning procedure (see *TLZ07 Cassette Tape Drive and Autoloader Owner's Manual*, section 6.1). If error repeats, try another tape.
Both LEDs flash rapidly, in unison.	Dirty heads or bad media.	Eject tape. Perform head cleaning procedure (see *TLZ07 Cassette Tape Drive and Autoloader Owner's Manual*, section 6.1). If error repeats, try another tape.
	Drive error, possibly a hard failure.	Eject tape. Power off and power on the drive. If error repeats, Call Multivendor Customer Services.
After applying power, nothing happens. All indicators off.	No tape loaded.	Load tape.
Unit not available to system.	Drive not plugged in.	Check ac power.
	SCSI ID switches set to incorrect address.	Check SCSI ID switch.
	Defective SCSI cable.	Make sure power cable is plugged in.
		Be sure SCSI cable connections are secure.

2.8 TZ86 Tabletop Cartridge Tape Subsystem Problems

Problem	Possible Cause	Corrective Action
Your system does not recognize the TZ86.	Your system is not configured to see the SCSI ID.	Configure your system to see the ID. For example, use SYSGEN AUTOCONFIG on the VMS operating system.
	The SCSI ID is not unique.	Change the SCSI ID and reconfigure the system. The new ID will be effective at the next power-on.
	The parameters for your SCSI adapter are incorrect.	Check your SCSI adapter installation.
	The SCSI signal cable is loose.	Make sure the connector on each end of the cable is fully seated.
	The SCSI terminator is not present or is loose.	Install the terminator; make sure the terminator is fully seated.
	The SCSI bus is not correctly terminated.	If the TZ86 is the last or only device on the bus, make sure the terminator is installed on the TZ86.
		If the TZ86 is not the last or only device on the bus, check the cable connections and make sure the terminator is installed at the end of the bus.
	The SCSI terminator is not at the end of the bus, or more than two terminators are present.	Be sure to install a terminator at each end of the bus. One terminator is usually installed at the system.
	The SCSI bus is too long, or too many devices are on the bus.	Limit the bus length to the ANSI SCSI standard of 6 meters (19 feet) and the number of devices on the bus (including the system) to eight. Check your system configuration rules.
The TZ86 does not power up.	The TZ86 has no power.	Check the TZ86 power cord connections, with the TZ86 power switch off.
All four indicators on the TZ86 front panel blink.	A drive fault has occurred.	Press the Unload button on the TZ86 front panel to clear the error. If the error does not clear, call Digital Services.

Problem	Possible Cause	Corrective Action
You are finding fatal or nonfatal errors for which you cannot determine the cause.	The bus termination or SCSI signal cable connections may be incorrect.	Make sure the SCSI bus is terminated.
	The ac power source grounding may be incorrect.	Use an ac outlet for the TZ86 on the same ac line that is powering the system.
Failure to mount or read /write with new or used cartridge.	Bad cartridge.	Retry with another cartridge.
	Dirty drive head.	Use CleaningTape III.
VMS INITIALIZE command fails with parity error.	Tape calibration failed.	Try another cartridge.
Green light is on and tape does not move (yellow light stays on, does not blink).	Cartridge load error.	Inspect the cartridge for a mispositioned leader (refer to *Tx86 Series Cartridge Tape Subsystem Owner's Manual* for Diagram of Cartridge Leader). Replace the cartridge if its leader is mispositioned.
		Inspect the drive for a damaged, misplaced, or unhooked leader (refer to *Tx86 Series Cartridge Tape Subsystem Owner's Manual* for Diagram of Cartridge Leader). Call Digital Services if the drive leader is not in the correct position.
All four lights are blinking.	Drive failed selftest or detected a hard error during operation.	Try to clear the error by pressing the Unload button. If the error does not clear (the tape does not rewind and unload and the four lights blink), you have a hardware failure. Call Digital Services.

2.9 TZ87 Tabletop Cartridge Tape Subsystem Problems

Problem	Possible Cause	Corrective Action
Your system does not recognize the TZ87.	Your system is not configured to see the SCSI ID.	Configure your system to see the ID. For example, use SYSGEN AUTOCONFIG on the VMS operating system.
	The SCSI ID is not unique.	Change the SCSI ID and reconfigure the system. The new ID will be effective at the next power-on.
	The parameters for your SCSI adapter are incorrect.	Check your SCSI adapter installation.
	The SCSI signal cable is loose.	Make sure the connector on each end of the cable is fully seated.
	The SCSI terminator is not present or is loose.	Install the terminator; make sure the terminator is fully seated.
	The SCSI bus is not correctly terminated.	If the TZ87 is the last or only device on the bus, make sure the terminator is installed on the TZ87.
		If the TZ87 is not the last or only device on the bus, check the cable connections and make sure the terminator is installed at the end of the bus.
	The SCSI terminator is not at the end of the bus, or more than two terminators are present.	Be sure to install a terminator at each end of the bus. One terminator is usually installed at the system.
	The SCSI bus is too long, or too many devices are on the bus.	Limit the bus length to the ANSI SCSI standard of 6 meters (19 feet) and the number of devices on the bus (including the system) to eight. Check your system configuration rules.
The TZ87 does not power up.	The TZ87 has no power.	Check the TZ87 power cord connections, with the TZ87 power switch off.
All indicators on the TZ87 front panel blink.	A drive fault has occurred.	Press the Unload button on the TZ87 front panel to clear the error. If the error does not clear, call Digital Services.

Problem	Possible Cause	Corrective Action
You are finding fatal or nonfatal errors for which you cannot determine the cause.	The bus termination or SCSI signal cable connections may be incorrect.	Make sure the SCSI bus is terminated.
	The ac power source grounding may be incorrect.	Use an ac outlet for the TZ87 on the same ac line that is powering the system.
Failure to mount or read /write with new or used cartridge.	Bad cartridge.	Retry with another cartridge.
	Dirty drive head.	Use CleaningTape III.
VMS INITIALIZE command fails with parity error.	Tape calibration failed.	Try another cartridge.
Green light is on and tape does not move (yellow light stays on, does not blink).	Cartridge load error.	Inspect the cartridge for a mispositioned leader (refer to *TZ87 Series Cartridge Tape Subsystem Owner's Manual* for Diagram of Cartridge Leader). Replace the cartridge if its leader is mispositioned.
		Inspect the drive for a damaged, misplaced, or unhooked leader (refer to *TZ87 Series Cartridge Tape Subsystem Owner's Manual* for Diagram of Cartridge Leader). Call Digital Services if the drive leader is not in the correct position.
All lights are blinking.	Drive failed selftest or detected a hard error during operation.	Try to clear the error by pressing the Unload button. If the error does not clear (the tape does not rewind and unload and the four lights blink), you have a hardware failure. Call Digital Services.

3

Running the MicroVAX Diagnostic Monitor (MDM)

The MicroVAX Diagnostic Monitor (MDM) is an optional software package containing diagnostic tests that isolate and identify faults in your system. MDM also lets you display your system configuration and test how devices work together.

MDM is on tape, in a cartridge labeled MV DIAG CUST TK50. MDM operating instructions begin in Section 3.2.

Caution

If your system is connected to a cluster, notify your cluster manager before halting the system to load MDM.

You generally run MDM in four situations:

- Before you install software on a new system

- After you add a device to your system

- After you receive an error message or experience a system problem

- When you want to test your system periodically to ensure that all components are operating correctly

3.1 MDM Limitations

MDM tests internal devices in your system, but it performs limited diagnostics.

- MDM reads from each drive and checks each controller, but it does not write to the drives because that could destroy data.

Note

MDM tests a tape or diskette drive only after the medium (tape or diskette) is inserted into the drive.

- MDM checks devices on the system as well as the system and interconnects.

- MDM checks terminal interfaces (but not terminals) by means of feedback connectors.

If your devices pass the tests but you still experience problems, call your Digital Services representative for further testing.

If you require more complete diagnostic testing, purchase the MicroVAX Maintenance Kit. That kit includes a system maintenance guide and the service diagnostic tests. The MDM version you receive with your system is a subset of the service version.

Caution

Only qualified service personnel should use the service diagnostic tests.

3.2 Preparing to Run MDM

Running MDM on some systems requires additional or special procedures:

Read Section 3.2.1 if you plan to run MDM on a diskless or tapeless system.

Read Section 3.2.2 if you plan to install MDM on a hard disk or RF-series Integrated Storage Element.

Read Section 3.2.3 if you plan to run MDM on a DSSI VAXcluster.

You can run MDM on an RRD-series disc drive by using the MDM CDROM Kit.

3.2.1 Preparing to Run MDM on a Diskless or Tapeless System

To run MDM on a diskless or tapeless system that is part of a local area network, you must:

- Obtain a MicroVAX Ethernet Server Customer Diagnostics Kit.

- Run MDM using the diagnostics in that kit, labeled MV DIAG ENET CUST.

Refer to the *MicroVAX Diagnostic Monitor Ethernet Server User's Guide* at this time. After you install and downline load MDM, refer again to that manual for instructions on running MDM.

Note

If you have a diskless or tapeless system that is not part of a local area network, you cannot run MDM. To diagnose problems, call your Digital Services representative.

3.2.2 Preparing to Run MDM on an EF/RF-Series Integrated Storage Element (ISE) or Hard Disk

You can install MDM on an EF/RF-series ISE or hard-disk drive by using the MDM Hard Disk Kit. Installation of that kit requires your completion of the Diagnostic Software Installation Acknowledgment. See the *MicroVAX Diagnostic Monitor Hard Disk User's Guide* for licensing requirements and installation instructions.

3.2.3 Preparing to Run MDM on a DSSI VAXcluster

Note

The MDM Hard Disk Kit is required for a two-system DSSI VAXcluster where one host is a tapeless system, and the other uses the TK70 tape drive.

TF-series tape drives are DSSI devices and can be shared between systems in a DSSI VAXcluster. Both systems in a two-system DSSI VAXcluster can boot MDM from the same drive, However you must run MDM separately from each host.

Before running MDM:

- Your system must be properly configured.
- The Digital Storage Systems Interconnect (DSSI) cable connecting the multiple hosts must be installed.

You must run MDM separately for each host. For TK70 based systems, the procedure to use depends on whether one host is a tapeless system (no tape drive) or each host has its own tape drive.

Use the procedure in Section 3.2.3.1 to prepare to run MDM in a DSSI VAXcluster with one TK70 tape drive.

Use the procedure in Section 3.2.3.2 to prepare to run MDM in a DSSI VAXcluster with a TK70 tape drive in each host.

3.2.3.1 MDM on a DSSI VAXcluster with One TK70 Tape Drive

To run MDM on a DSSI VAXcluster with one TK70 tape drive (one or more tapeless hosts):

- Use the MDM Hard Disk Kit.

- Complete the Diagnostic Software Installation Acknowledgment.

- Install the kit on a hard disk or an EF/RF-series ISE as described in the *MicroVAX Diagnostic Monitor Hard Disk User's Guide*.

After the installation is complete, use the following procedure to run MDM.

1. If software is installed on your system:

   a. Warn all users to log off.

   b. Perform system shutdown as described in your software manuals.

2. Set the Break Enable/Disable switch on the host to be tested to enable (up).

3. Insert a blank tape cartridge into the tape drive and lock it in place.

4. Restart the host to be tested.

5. Enter one of these commands, where u is the unit number of the disk containing the Hard Disk Kit and c is the controller port letter.

   BOOT/100 DIAu (CPU-based DSSI)

   BOOT/100 DUcu (KFQSA adapter or KDA50 controller)

   The system prompts for the boot file name by displaying `Bootfile:`

6. Enter one of these file names.

   [SYS0.SYSEXE]MDMSHA.SYS (CPU-based DSSI)

   [SYS0.SYSEXE]MDM.SYS (KFQSA adapter or KDA50 controller)

   Then press Return to continue booting.

7. Run MDM as described in Section 3.3.

8. After you complete the tests on the first host:

   a. Make sure the Break Enable/Disable switch is set to enable (up) and press the Restart button on that host.

   b. After the countdown completes and the >>> prompt displays, boot MDM from the second system using the procedure described in steps 2 through 6.

c. Run MDM as you did for the first system.

3.2.3.2 MDM on a DSSI VAXcluster with Two TK70 Tape Drives

To run MDM on a DSSI VAXcluster with two tape drives in each system:

Note

You can also use the MDM Hard Disk Kit as described in the previous section.

---

1. If software is installed on your system:

   a. Warn all users to log off.

   b. Perform system shutdown as described in your software manuals.

2. Set the Break Enable/Disable switch on the host to be tested to enable (up).

3. Make sure the Write Protect switch on the tape cartridge containing the MDM diagnostic is in the Write Protect Position.

4. Insert the tape cartridge containing MDM into the tape drive and lock it in place.

5. Restart (turn on) both hosts.

6. After the self-test countdown completes and the >>> prompt displays, enter the command BOOT MUcu, where c is the controller designator and u is the drive unit number, to boot the tape.

7. Run MDM as described in Section 3.3.

8. After you complete the tests on the first host:

   a. Remove the tape cartridge, by following the procedure described in your *Operation* manual, and press the Restart button on that host.

   b. After the self-test countdown completes and the >>> prompt displays, insert the tape cartridge into the tape drive in the second system and lock it in place.

   c. Enter the command BOOT MUcu, where c is the controller designator and u is the drive unit number, to boot the tape.

   d. Run MDM as you did for the first system.

3.3 Starting MDM

You must start MDM differently for different media:

If you are booting MDM from a tape drive, read Section 3.3.1.

If you are booting MDM from an RRD-series disc drive, read Section 3.3.2.

If you are booting MDM from a hard disk or an EF/RF-series ISE, refer to the *MicroVAX Diagnostic Monitor Hard Disk User's Guide*.

Caution

Unless instructed to do so, do not change any settings or manipulate devices while the tests are running. MDM interprets any change of state as an error.

3.3.1 Tape Drive Instructions

Before you run MDM, be sure you understand the instructions in your *Operation* manual for using the tape drive.

MDM runs the same way whether or not system software is loaded.

- You can boot MDM manually from a TF-series, TK50 or TK70 tape drive (Section 3.3.1.1).

- You can use the autoboot feature to boot MDM only from a TK50 or TK70 tape drive (Section 3.3.1.2).

Note

If your system is part of a local area network (LAN), you can reduce the time required to load MDM by obtaining the MicroVAX Ethernet Server Customer Diagnostics Kit. That kit lets you install MDM on a host system and downline load MDM to other systems that are part of the LAN, using the DECnet/Ethernet network facilities.

3.3.1.1 Booting MDM Manually

Use this procedure to boot MDM from a TF-series, TK50 or TK70 tape drive.

1. If software is installed on your system:

   a. Warn all users to log off.

   b. Perform system shutdown as described in your software manuals.

2. Make sure the write protect switch on the tape cartridge is in the write-protect position.

3. If your system contains software, write-protect all disk drives and RF-series ISEs.

4. Move the Break Enable/Disable switch to enable (up).

5. Restart the system.

6. After the green light on the tape drive glows steadily (orange and yellow lights go out), insert the tape cartridge containing MDM into the tape drive and lock it in place.

7. Tell your system to load MDM from the tape cartridge:

   > For a TK50 or TK70 tape drive, enter the command BOOT MUcu, where c is the controller designator and u is the drive unit number.

   > For a TF-series tape drive, enter the command BOOT/100 MImc, where m is the DSSI bus adapter and c is the drive unit number. Then, when your system displays Bootfile:, enter [SYS0.SYSEXE]MDM.SYS (the boot file name).

   Loading MDM takes several minutes. A green light on a TK50 drive or a yellow light on a TK70 or TF-series drive blinks while loading occurs. Section 3.4 describes the display you see after loading completes.

8. After loading completes, make sure all EF/RF-series ISEs are on line.

3.3.1.2 Booting MDM Automatically

Use this procedure to boot MDM from a TK50 or TK70 tape drive. Do not use this procedure for a TF-series tape drive.

1. If software is installed on your system:

   a. Warn all users to log off.

   b. Perform system shutdown as described in your software manuals.

2. Enter the command SET BOOT MUcu.

3. Make sure the write protect switch on the tape cartridge is in the write-protect position.

4. Remove any removable disks, and place all fixed-disk drives and RF-series ISEs off line.

5. Write-protect all disk drives and EF/RF-series ISEs.

6. Turn off your system.

7. Set the Break Enable/Disable switch to disable (down).

8. Turn on your system.

9. After the green light on the tape drive glows steadily, insert the tape cartridge containing MDM into the drive and lock it in place.

   Loading MDM takes several minutes. A green light on a TK50 drive or a yellow light on a TK70 drive blinks while loading occurs. Section 3.4 describes the display you see after loading completes.

10. After loading completes, make sure all EF/RF-series ISEs are on line.

3.3.2 RRD-Series Disc Instructions

If you are using an RRD-series disc drive connected to a KZQSA adapter or KRQ50 controller, use the following procedure to boot MDM.

1. If software is installed on your system:

   a. Warn all users to log off.

   b. Perform system shutdown as described in your software manuals.

2. Place all hard-disk drives and EF/RF-series ISEs off line.

3. Turn off your system.

4. Set the Break Enable/Disable switch to disable (down).

5. Turn on your system (and the disc drive).

6. Insert the disc caddy into the disc drive:

   a. Remove the disc from its package.

   b. Insert the disc into the caddy (See MDM CDROM booklet.).

   c. Insert the caddy into the drive slot:

      For an RRD40 drive, push the caddy in until it stops. Then withdraw the caddy. The disc remains in the drive.

      For another RRD-series drive, the caddy stays in the drive. Do not remove it.

7. Tell your system to load MDM from the disc:

    For a KZQSA adapter, enter the command BOOT DKxnnn, where x is the adapter designator and nnn is the drive unit number.

    For a KRQ50 controller, enter the command BOOT/100 DUcu, where c is the controller designator and u is the drive unit number. Then, when your system displays `Bootfile:`, enter [SYS0.SYSEXE]MDMCD.SYS (the boot file name).

    Loading MDM takes several minutes. Section 3.4 describes the display you see after loading completes.

8. After loading completes, place all hard disks and EF/RF-series ISEs on line.

3.4 MDM Introductory Display

After MDM is loaded, the introductory display appears. Make sure the date and time in that display are correct.

*   If the date and time are correct, press Return to continue.

*   If the date and time are not correct, type the correct date and time using the format shown in the display. For example, enter 10–JUN–1991 02:30 and press Return to continue.

The Main Menu appears. Section 3.5 describes the options on that menu.

3.5 Main Menu Options

The Main Menu provides six options as shown below.

```
MAIN  MENU                         Release nnn    Version  xx.xx

 1 - Test the System

 2 - Display System Configuration and Devices

 3 - Display the System Utilities Menu

 4 - Display the Service Menu

 5 - Display the Connect/Ignore Menu

 6 - Select Single Device Tests

Type the number; then press the RETURN key.
```

_____ **Note** _____

The MDM release and version numbers are represented by nnn and xx.xx respectively in the displays provided throughout this chapter.

_____

Select an option by typing its number and $\boxed{\text{Return}}$.

The next six sections describe the options on the Main Menu.

3.5.1 Test the System Option

The Test the System option tests the devices it sees in your system and how they work together. You can select this option at any time without jeopardizing data.

After you select this option, the diagnostics are prepared for testing. If this is the first option you selected, the diagnostics are loaded. Loading takes several minutes. After loading completes, you are prompted to press $\boxed{\text{Return}}$.

After you press $\boxed{\text{Return}}$, an explanation of the testing procedures appears.

When you are ready to begin the test, press $\boxed{\text{Return}}$. Your system displays `Begin Device Tests`.

As each device passes the test, it is listed on your terminal screen.

---------------------------------- **Note** ----------------------------------

Because of the similarity of some communication options, MDM sees them as the same device. A CXA16 and CXB16 appear the same to MDM. A generic device name, DH–CX0, is listed for such options, and the last letter in each name shows the difference. For example, DH–CX0A indicates one option, DH–CX0B a second, and so forth.

If a device fails the test, you receive a failure message which identifies:

    The device tested

    When the failure occurred

    The field-replaceable unit (FRU)

Copy the failure message and report it to your Digital Services representative.

This shows an example of an unsuccessful test.

```
BEGIN FUNCTIONAL TEST

    Device                    Result

    SGCA  ................  FAILURE DETECTED

    A failure was detected while testing the

        OPTION: SGCA  Ethernet controller

    The Field Replaceable Unit (FRU) identified is the:
```

```
        Ethernet controller
```

If your system has serious problems, the following message appears.

```
All devices disabled, no tests run.
```

Report that message to your Digital Services representative.

After a failure message appears, the testing stops.

After all devices pass the first part of the test, the exerciser tests begin. Those tests take about 4 minutes and test how the devices work together. If the devices pass, you receive a success message.

At the end of the tests, press Return to return to the Main Menu.

From the Main Menu you can exit MDM as described in Section 3.6 or you can select one of the other options.

3.5.2 Display System Configuration and Devices Option

The Display System Configuration and Devices option identifies devices recognized by MDM.

After you select this option, the diagnostics are prepared for testing. If this is the first option you selected, the diagnostics are loaded. Loading takes several minutes. After loading completes, you are prompted to press Return.

After you press Return, the configuration is displayed:

```
MAIN  MENU                          Release nnn    Version  xx.xx

SYSTEM CONFIGURATION AND DEVICES

CPUA ... VAX 4000 CPU
     KA6nn MC=01 FW=3.9
MEMA ...  VAX 4000 memory system
     64 Megabytes. 131072 Pages.
          MS690 ... 32MB memory module
          MS690 ... 32MB memory module
PDIA ... SHAC DSSI Subsystem
     SHAC Ver. 3.6
          RF73 ...  Unit #0, Dssi Disk, Online
          TF85/TF86 ...  Unit #1, Dssi Tape, Online
          RF73 ...  Unit #11, Dssi Disk, Online
SGCA ... Second Generation Ethernet Controller
     SGEC V4 08-00-2B-19-60-66
PDIB ... SHAC DSSI Subsystem
     SHAC Ver. 3.6

Press the RETURN key to return to the previous menu. >
```

Up to two lines of information are provided for each device:

One line lists the name of the device and gives a brief description.

A second line may indicate the revision level of the device.

The revision level can refer to hardware or microcode. For example, the KA6nn CPU described above is at revision 3.9 for microcode (MC=01).

Besides the general information listed for each device, more information for specific devices may be given. Some examples:

- CPUA — Type of CPU, presence of a floating-point unit

- MEMA — Total amount of memory in megabytes and pages, number and type of memory modules

- KFQSA — Type of DSSI device and its unit number for each ISE

- KDA50 — Unit number, drive type, controller revision number

- PDIA — DSSI adapter, for Bus 0 embedded in KA6nn CPU

- DESQA — Ethernet station address

- SGCA — On-board Ethernet controller, embedded in KA6nn CPU

- PDIB — DSSI adapter for Bus 1, embedded in KA6nn CPU

- Communication devices — Type of device and whether it has modem control

In addition to showing information about testable device options, MDM displays messages indicating the presence of nontestable system devices. If a device is in your system but is not listed in the System Configuration and Devices display, one of the following two messages can indicate the reason.

`No Dg xxx ... Diagnostic not loaded`

MDM displays a `No Dg` (no diagnostic) message for each nontestable Digital device in your system, where xxx indicates the device. For example, if MDM cannot find the TK70 tape drive diagnostic, the message `No Dg TKA` is displayed. TKA indicates that the device is a TK tape drive. Such a message can appear when:

The medium is not installed properly.

The diagnostic is not on the medium.

`Unknown ... Diagnostic not loaded`

The `Unknown` (unknown device) message indicates that a device not recognized by MDM is attached to your system. That message appears when:

A device is configured to a nonstandard CSR address.

A Digital device that has no diagnostic is attached to your system. That can occur if a device not supported on your system is attached.

A non-Digital device is attached to your system.

After all devices are listed, you can return to the Main Menu by pressing Return .

From the Main Menu you can exit MDM as described in Section 3.6 or you can select one of the other options.

3.5.3 Display the System Utilities Menu Option

The Display the System Utilities Menu option displays the System Utilities Menu. If system utilities in addition to the IOADDRES function are available on your system, they are listed on that menu.

After you select this option, the diagnostics are prepared for testing. If this is the first option you selected, the diagnostics are loaded. Loading takes several minutes. After loading completes, you are prompted to press Return .

After you press Return , the System Utilities Menu appears:

```
MAIN MENU
SYSTEM UTILITIES

  Utility selections are:

  1 - IOADDRES
  2 - RRAA - Update drive unit number for RRD40 controller A.
  3 - RRAB - Update drive unit number for RRD40 controller B.
```

_____ **Note** _____

If your system does not have an RRD-series drive connected to a KRQ50 controller, only one function, IOADDRES, is available.

_____

Select a function by typing its number and Return .

3.5.3.1 IOADDRES Function

_____ **Note** _____

The IOADDRES function is for users of Industrial VAX systems. It is described in the Industrial VAX troubleshooting manual.

_____

The IOADDRES function gives you a list of standard CSR addresses and interrupt vectors that MDM uses in testing devices. The first available CSR and interrupt vector for configuring devices with a nonstandard address is also given. IOADDRES does not look at devices on the bus; it lists devices supported by Digital Customer Services.

The devices in your system were configured at the factory. Any new devices added to your system should be configured by a Digital Services representative.

3.5.3.2 Update Drive Unit Number for RRD-Series Function

The Update Drive Unit Number function lets you update the unit number for an RRD-series disc drive connected to a KRQ50 controller. Refer to the appropriate RRD-series disc drive owner's manual for instructions.

3.5.4 Display the Service Menu Option

The Display the Service Menu option is available only if you purchased the MicroVAX Maintenance Kit. That kit contains service diagnostics and the system maintenance guide.

Caution

Only qualified service personnel should use the MicroVAX Maintenance Kit.

3.5.5 Display the Connect/Ignore Menu Option

Note

The Connect/Ignore Menu is for users of Industrial VAX systems. Its options are described in the Industrial VAX troubleshooting manual.

The Display the Connect/Ignore Menu option lets you customize MDM diagnostics. You can load your own diagnostics on a device, as well as load MDM diagnostics on a device with a nonstandard CSR address and interrupt vector.

See the *Industrial VAX Troubleshooting* manual; use this option with caution.

3.5.6 Select Single Device Tests Option

The Select Single Device Tests option lets you run tests for a single device.

*   A functional test is performed on the device circuits.

*   An exerciser test ensures that the device works properly.

After you select this option, the diagnostics are prepared for testing. If this is the first option you selected, the diagnostics are loaded. Loading takes several minutes. After loading completes, you are prompted to press Return .

After you press Return , a list of the devices in your system is displayed:

```
MAIN  MENU                      Release nnn   Version  xx.xx
SELECT SINGLE DEVICE TEST

Select the device number to be tested.  The functional tests
will be run followed by the exercisers for 4 minutes.

1 - CPUA - VAX 4000 CPU
2 - MEMA - VAX 4000 memory system
3 - PDIA - SHAC DSSI Subsystem
4 - SGCA - Second Generation Ethernet Controller

5 - PDIB - SHAC DSSI subsystem

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. >
```

---------------------------------- **Note** ----------------------------------

Because of the similarity of some communication options, MDM sees them as the same device. A CXA16 and CXB16 appear the same to MDM. A generic device name, DH–CX0, is listed for such options, and the last letter in each name shows the difference. For example, DH–CX0A indicates one option, DH–CX0B a second, and so forth.

Select a device for testing by typing its number and Return .

After you press Return , your system configures the device diagnostics and testing begins. If the device passes the functional test, a message to that effect appears and the exerciser test begins. The exerciser test runs for approximately 4 minutes.

This shows an example of a successful test.

```
BEGIN FUNCTIONAL TEST

    Device                    Result

    CPUA .................    PASSED
BEGIN EXERCISER TEST

    Results are reported at the end of the testing.
SINGLE DEVICE TEST PASSED
```

If a device fails the test, you receive a failure message which identifies:

The device tested

When the failure occurred

The field-replaceable unit (FRU)

Copy the failure message and report it to your Digital Services representative.

This shows an example of an unsuccessful test.

```
BEGIN FUNCTIONAL TEST

    Device                   Result

    SGCA ...............    FAILURE DETECTED

    A failure was detected while testing the

        OPTION: SGCA  Ethernet controller

    The Field Replaceable Unit (FRU) identified is the:

        Ethernet controller
```

After a failure message appears, the testing stops.

Press ⌈Return⌉ to return to the Select Single Device Test menu for more testing.

To exit MDM, press ⌈Break⌉ or the Restart button.

3.6 Exiting MDM

Exit MDM in one of the following ways.

• Press ⌈Break⌉.

• Press and then release the Halt button.

• Press the Restart button.

Remove the tape cartridge as described in your *Operation* manual.

If you ran MDM on a new system, you are ready to install your software. Set the write protect button to write-enable and then follow the instructions in your software manuals.

If you ran MDM on a system containing software, you must reboot that software.

You can reboot your system software in one of two ways:

- At the console mode prompt (>>>), use the command BOOT Dxxx, where Dxxx is the device name of the fixed disk or EF/RF-series ISE containing your system software.

  Use DUxx for an RA-series disk drive, or an EF/RF-series ISE with a KFQSA adapter.

  Use DIxx for an EF/RF-series ISE with a CPU-based DSSI.

  After your system software is loaded, set the Break Enable/Disable switch to disable (down) to avoid halting the system by pressing ⌊Break⌋.

- Set the Break Enable/Disable switch to disable (down) and press the Restart button. That begins the self-test sequence and loads system software.

A
System Controls and Indicators

The illustrations in this appendix show the controls and indicators on your system:

Figure A–1: System Control Panel and Power Supply

Figure A–2: Integrated Storage Element and Console Module

Figure A–3: TK70 and TK50 Tape Drives

Figure A–4: TF-Series and TLZ04 Tape Drives

Figure A–1 System Control Panel and Power Supply
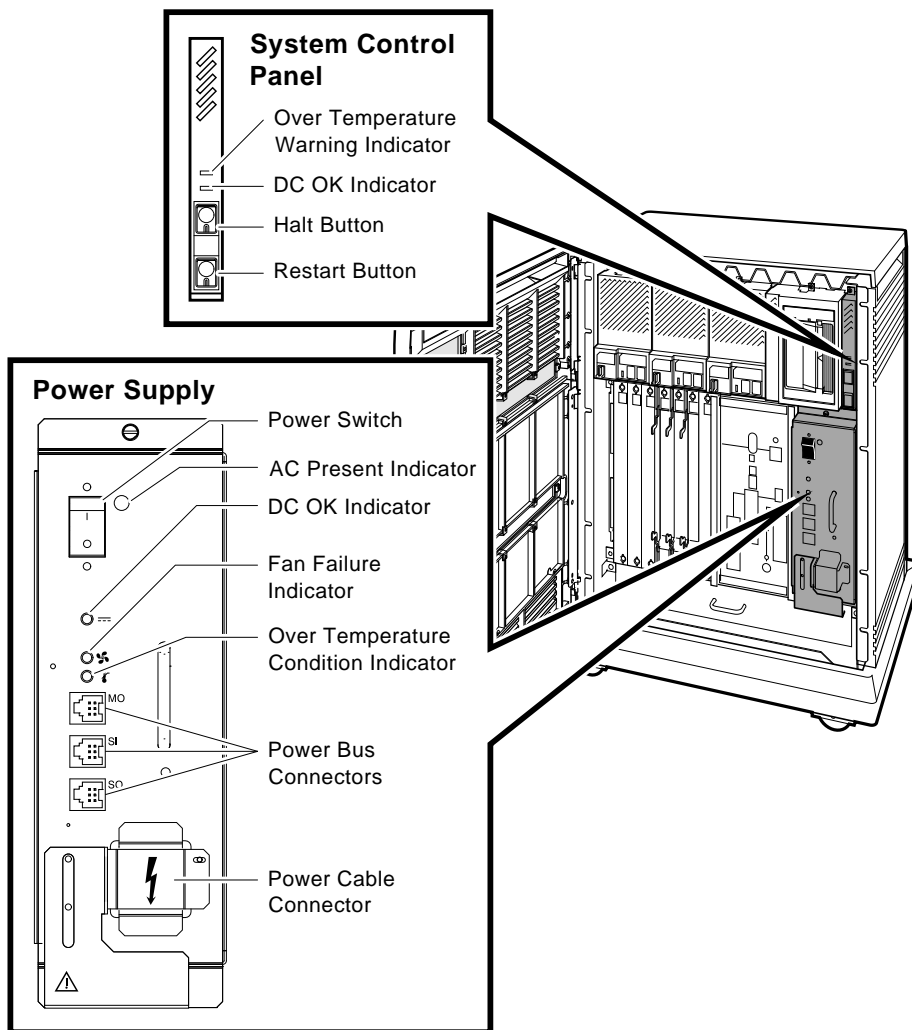
MLO-004050

Figure A–2   EF/RF-Series ISE and Console Module

Integrated Storage Element

RF3x/7x   RF3x2

Bus Node
ID Plugs

Bus Node
ID Plug   Fault
                                 Indicator

Fault   Write-Protect
Indicator   Button   Run/Ready
               Run/Ready   Indicator
               Button

Console Module

Power-Up
Mode Switch   Modified
                                 Modular Jack

Baud Rate
Select Switch

                                 Break Enable/
                                 Disable Switch

LED Display

                                 Bus Node ID Plugs

DSSI   Ethernet Connector
Connectors   Switch

                                 Standard Ethernet
                                 Connector

                                 ThinWire Ethernet
                                 Connector

MLO-010219

Figure A–3   TK70 and TK50 Tape Drives

TK70 TAPE DRIVE

Write Protect

Tape in Use

TK70

Operate Handle

Unload

Orange Light

Yellow Light

Green Light

Unload Button

Handle

TK50 TAPE DRIVE

Load/Unload
Button,
Red Light

Handle Closed

Green
Indicator
Light
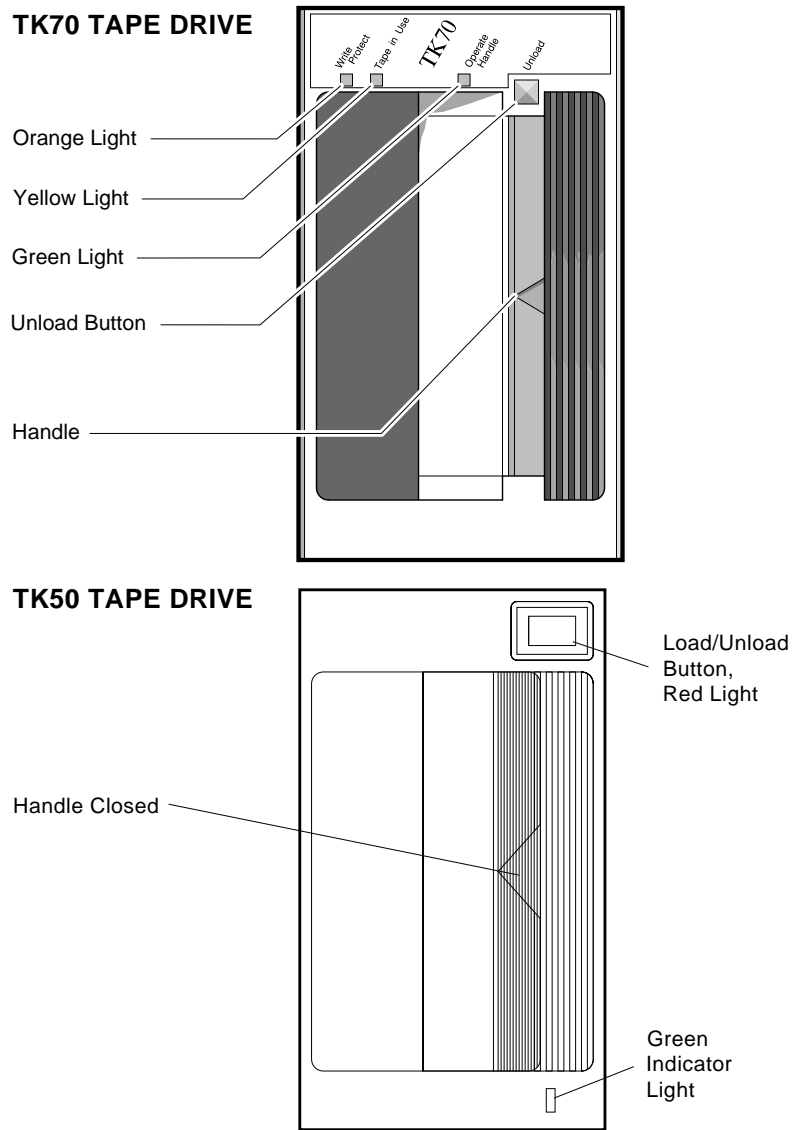
MLO-005341

Figure A–4 TF-Series Tape Drive

TF85 TAPE DRIVE

Write Protected
Tape in Use
Use Cleaning Tape
Operate Handle
TF85
Unload

To Load
● Wait El Light
● Open this Handle
● Insert Tape
● Close this Handle

To Unload
● Press Button
● Wait El Light
● Open this Handle
● Remove Tape

Orange Light

Yellow Light

Orange Light

Green Light

Bus Node
ID Plug

Cartridge Insert/
Release Handle
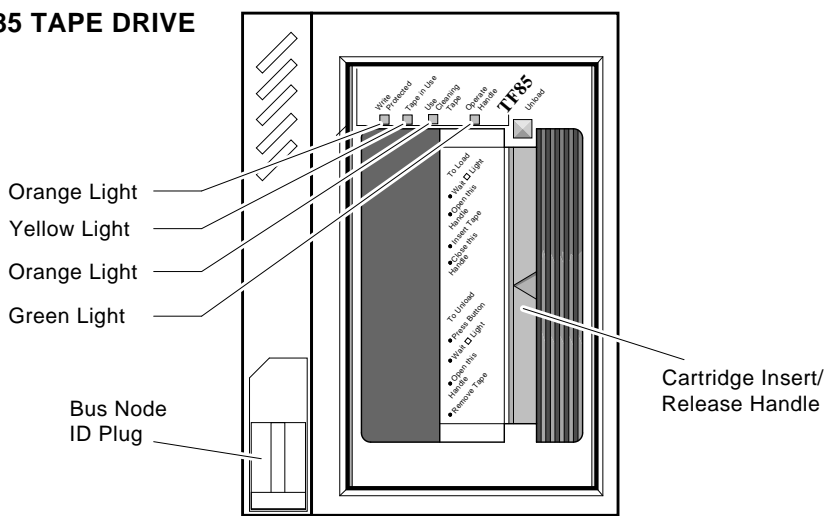
MLO-010214

B

Write-Protecting an EF/RF-Series ISE

You may want to write-protect an ISE containing sensitive data you do not want changed or accidentally erased.

For all 3.5-inch drives, you write-protect an ISE by setting the Write-Protect button to in (lit). For the EF/RF ISE, which has no Write-Protect button, you set write-protection through VMS commands or through firmware commands in console mode, explained later in this section.

The Write-Protect button controls whether the system can write data to the ISE. The system can read from the ISE regardless of the setting of the Write-Protect button. When the Write-Protect button is out (not lit), the system can write to the ISE.

Your system disk (the ISE containing system software) and ISEs containing work areas for users should be write-enabled, the normal operating setting.

B.1 Software Write-Protect for EF/RF-Series ISEs

Since the EF/RF does not have a Write-Protect button, the software write-protect is the primary method for write-protecting an EF/RF.

The software write-protect is available through VMS using the MOUNT utility with the /NOWRITE qualifier.

To software write-protect an ISE, enter the following DCL command from the VMS operating system.

```
MOUNT <device_name> <volume_label>/SYSTEM/NOWRITE
```

where <device_name> is the device name, as shown using the VMS DCL command SHOW DEVICE DI, and <volume_label> is the volume label for the device. For example,

```
$ MOUNT $1$DIA1 OMEGA/SYSTEM/NOWRITE
```

will software write-protect device 1DIA1.

Dismounting, and then remounting the device (without using the /NOWRITE qualifier), will write-enable the device.

Use the VMS DCL command SHOW DEVICE DI to check the protection status of the drive. A write-protected drive will show a device status of `Mounted wrtlck`. Refer to your VMS documentation for more information on using the MOUNT Utility.

Caution _____

When you dismount then mount the device again, it will no longer be write-protected.

B.2 Hardware Write-Protect for EF/RF ISEs

The hardware write-protect provides a more permanent write-protection than the software write-protect in that once you hardware write-protect an EF/RF it remains write-protected regardless of the availability of the operating system or if the system is powered-down. In addition, a hardware write-protect cannot be removed using the MOUNT command. The hardware write-protect simply provides the same degree of write-protection available to EF/RF-series ISEs that have a Write-Protect button.

You should consider hardware write-protecting an EF/RF in the following situations.

- If you want to write-protect an EF/RF ISE when the VMS operating system is not available, such as before running the MicroVAX Diagnostic Monitor (MDM).

- If you want to ensure that an EF/RF remains write-protected, since the hardware write-protect cannot be removed using the VMS command MOUNT and will remain in effect even if the operating system is brought down.

You can hardware write-protect an EF/RF from VMS or through firmware commands entered at the console prompt (>>>). Use the following instructions.

1. Access the Diagnostic and Utility Program (DUP) driver for the device you want to write-protect.

   - To access the DUP driver from console mode:

     a. Enter console mode by pressing the Halt Button or powering up the system with the Break Enable/Disable switch set to enable (up, position 1).

Caution

Halting your system without following the shutdown procedure described
in your system software manuals may result in loss of data.

---

    b. Access the DUP driver by setting host to the specific device you want
        to write protect.

        Use the following command for embedded DSSI.

        `SET HOST/DUP/DSSI/BUS:<bus_number> <node_number> PARAMS`

        where <bus_number> is the DSSI bus number (0,1,2,3), and <node_
        number> is the bus node ID (0–6) for the device on the bus (bus
        number and node number are listed in the SHOW DSSI display).

        Use the following command for KFQSA-based DSSI.

        `SET HOST/DUP/UQSSP/DISK <controller_number> PARAMS`

        where <controller_number> is the controller number (listed in the
        SHOW UQSSP display) for the device on the bus.

- To access the DUP driver from VMS:

    a. Connect to the Diagnostic and Utility Program (DUP) and load its
        driver using the VMS System Generation Utility (SYSGEN) as shown
        below.

```
$ MCR SYSGEN
SYSGEN> CONNECT/NOADAPTER FYA0
SYSGEN> EXIT
$
```

    b. Access the DUP driver by setting host to the specific device you want
        to write protect. Use the following command.

        `SET HOST/DUP/SERVER=MSCP$DUP/TASK=PARAMS <node_name>`

        where <node_name> is the device node name (the node name, in
        parenthesis, is listed in the SHOW DEVICE DI display).

2. At the `PARAMS>` prompt, enter `SET WRT_PROT 1` to write-protect the ISE to
    which you are currently connected.

Note

To verify that you have set host to the intended drive, you can enter the
command LOCATE at the PARAMS> prompt. The LOCATE command
causes the drive's Fault indicator to blink momentarily.

---

3. Enter SHOW WRT_PROT to verify the WRT_PROT parameter is set to 1.

4. After you have completed setting and examining the WRT_PROT device parameter, enter the WRITE command at the PARAMS> prompt to save the device parameter. The change is recorded to nonvolatile memory.

5. Enter the EXIT command at the PARAMS> prompt to exit the DUP driver utility for the specified device.

This is an example of setting a hardware write-protect through firmware.

```
>>>SET HOST/DUP/DSSI/BUS:0 1 PARAMS
Starting DUP server...
Copyright (c) 1992  Digital Equipment Corporation
PARAMS>SET WRT_PROT 1
PARAMS>WRITE
PARAMS>SHOW WRT_PROT
Parameter     Current         Default      Type     Radix
---------  ----------------  ---------------- -------- -----
WRT_PROT              1                 0   Boolean   0/1
PARAMS>EXIT
Exiting...
Stopping DUP server...
>>>
```

This is an example of setting a hardware write-protect through VMS.

```
$ MCR SYSGEN
SYSGEN> CONNECT/NOADAPTER FYA0
SYSGEN> EXIT
$ SET HOST/DUP/SERVER=MSCP$DUP/TASK=PARAMS R35F3C
Starting DUP server...
Copyright (c) 1992  Digital Equipment Corporation
PARAMS>SET WRT_PROT 1
PARAMS>WRITE
PARAMS>SHOW WRT_PROT
Parameter     Current         Default      Type     Radix
---------  ----------------  ---------------- -------- -----
WRT_PROT              1                 0   Boolean   0/1
PARAMS>EXIT
Exiting...
Stopping DUP server...
$
```

To remove the hardware write-protection, repeat the above procedure, only set the WRT_PROT value to 0.

You can verify that the device is write-protected while running VMS—when you issue the VMS DCL command SHOW DEVICE DI, a write-protected drive will show a device status of `Mounted wrtlck`. If you issue the VMS command SHOW DEVICE/FULL, a write-protected drive will be listed as `software write-locked`.

Note

You cannot remove hardware write-protection using the VMS MOUNT utility.

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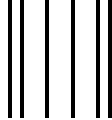For software manuals, please indicate which version of the software you are using: _____

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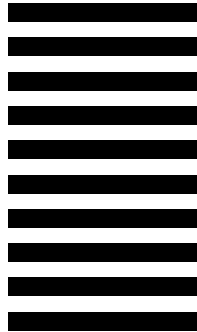
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