

# **MicroVAX Troubleshooting and Diagnostics**

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## Preface

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

This book contains troubleshooting information for all MicroVAX/VAXserver systems: MicroVAX II and MicroVAX 3000-series systems. Appendix A contains diagrams of each MicroVAX system. Using the diagram of your system, follow the troubleshooting procedures recommended in this guide.

This manual contains three chapters:

- Chapter 1 describes problems you may experience at power-on and corrective actions.
- Chapter 2 describes problems you may have during normal operation of your system and corrective actions.
- Chapter 3 describes 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 diagrams of each system showing the location of the controls and indicators.

The troubleshooting techniques described in this manual do not identify all possible problems with your system, nor do the actions suggested remedy all problems. If the actions suggested do not solve the problem, call your DIGITAL service representative.

## Conventions

The following conventions are used in this book:

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Convention	Meaning
<b>Key</b>	A symbol denoting a terminal key used in text and examples in this book. For example, <b>Break</b> indicates that you press the Break key on your terminal keypad. <b>Return</b> indicates that you press the Return key on your terminal keypad.
<b>Ctrl/C</b>	A symbol indicating that you hold down the Ctrl key while you press the C key.
<b>Bold</b>	Bold type is used to indicate user input. For example:  <b>&gt;&gt;&gt; BOOT MUA0</b>  This line shows that the user must type <b>BOOT MUA0</b> at the console prompt <b>&gt;&gt;&gt;</b> .
<b>NOTE</b>	Provides general information about the current topic.
<b>CAUTION</b>	Provides information to prevent damage to equipment or software.
<b>WARNING</b>	Provides information to prevent personal injury.

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## Troubleshooting During Power-On

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When you power on your system, the MicroVAX processor performs a series of self-tests and start-up routines. After successful completion of the self-tests, if the Break Enable/Disable<sup>1</sup> switch is set to disable, the system attempts to autoboot system software.

### 1.1 Autobooting the MicroVAX System

The MicroVAX autoboot function is different for each MicroVAX system.

#### 1.1.1 Autobooting MicroVAX 3300/3400/3800/3900 Systems, and MicroVAX 3500/3600 Systems with Version 4.1 ROM Code (or greater)

The MicroVAX 3300, 3400, 3800, 3900 systems, as well as those MicroVAX 3500 and 3600 systems using version 4.1 ROM code or greater, attempt to automatically boot (autoboot) from a specified drive when you have used the Set Boot command (SET BOOT *device name*) from console mode. The system continues to boot from the specified device each time it is powered on until you specify differently by using the Set Boot command again.

If you have not used the Set Boot command, the system boots automatically from the Ethernet port, ESA0.

#### 1.1.2 Autobooting MicroVAX 3500 and 3600 Systems

The MicroVAX 3500 and 3600 systems using version 1.2 or 1.4 ROM code, attempt to autoboot a specific drive when you use the Set Boot command (SET BOOT *device name*) from console mode. The system continues to boot from the specified device each time it is powered on until you specify differently by using the Set Boot command again.

If you have not used the Set Boot command, the system attempts to autoboot by looking for bootable software the same way a MicroVAX II system looks for bootable software. See Section 1.1.3 for more information.

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<sup>1</sup> MicroVAX II systems have a Halt Enable/Disable switch.

### 1.1.3 Autobooting MicroVAX II Systems

When a MicroVAX II system attempts to autoboot, it looks for bootable software on the following devices in the order shown below:

1. Removable disks and diskettes (RX33, RX50, and RA60 in ascending unit number)
2. Fixed-disk drives (RD-series/RA-series/RF-series in ascending unit number)
3. Tape cartridges (TK50/TK70, TS05, TU81-Plus)
4. EPROM
5. Ethernet adapter

Normally, the system automatically boots system software which has been installed on a fixed-disk drive. When booting a fixed-disk drive, you must remove all removable disks and place all disks ahead of the disk containing the system software off-line. For example, if you want to boot system software from an RA81 or RA82 fixed disk, place all removable media, as well as all RD-series and RF-series disks, and RA60 disks (if any) off-line. (See operating instructions for each drive in your system-specific *Operation* manual.)

To boot software from a TK50 or TK70 tape cartridge, or the Ethernet, you must place all removable and fixed-disk drives off-line.

An alternative to placing disks off-line is to boot your system manually from the console terminal using the *BOOT device name* command in console mode. (See *Operation* for more information.)

## 1.2 Troubleshooting Power-On Problems

If you do not observe the correct power-on and boot sequence responses, refer to the possible problems and corrective actions described in Table 1-1. If the actions listed do not solve the problem, call your DIGITAL service representative.

**NOTE:** *Table 1-1 occasionally recommends that you run MDM as a service tool to help diagnose problems. Refer to Chapter 3 of this manual for instructions on using MDM.*

**Table 1-1: Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>Problems During Self-Tests</b>		
No response when the on/off switch is turned on (switch is not lit).	System is not plugged in.	Set the on/off switch to 0. Plug in the system. Set the on/off switch to 1.
	No power at the wall outlet.	Use a different wall outlet, or check the circuit breaker controlling power to the wall outlet.
	Circuit breaker(s) has tripped.	Set the on/off switch to 0. Reset the circuit breaker(s). <sup>1</sup> Set the on/off switch to 1. If the circuit breaker(s) trips again, call your DIGITAL service representative.
	Power cable is incorrectly installed.	Set the on/off switch to 0. Check that the cable is fully seated in the socket. Set the on/off switch to 1.
The system has power (the on/off switch is lit), but nothing displays on the console terminal.	Console terminal is turned off.	Turn on the console terminal.
	Console terminal is off-line.	Put the terminal on-line. Refer to the terminal documentation for instructions.
	Console terminal cable is not installed correctly.	Make sure the cable is installed properly at both ends.
	Console terminal Set-Up has not been done correctly.	Reread the section, Install the Console Terminal, in your system-specific <i>Installation</i> manual.
	Baud rate setting of the system and the terminal do not match.	Set the terminal baud rate to match the system. The normal operating setting is 9600.
	Power-Up Mode switch on the CPU panel is set to T.	Set the switch to Run (indicated by an arrow).
	Terminal is defective.	Turn off terminal and turn it on again to see if it passes its self-tests. If it fails self-tests, call your DIGITAL service representative.

<sup>1</sup>Locate and reset the circuit breaker(s) on your system using the diagrams in Appendix A.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The self-tests halted and an error message or error summary displays on the console terminal.	The system detected an error while running its self-tests.	Copy the number following the question mark in the error message or summary and call your DIGITAL service representative.
The system loses power, but the on/off switch is lit.	Power supply failure.	Call your DIGITAL service representative.
<b>General Problems During Boot Sequence</b>		
The system returns to the BOOT prompt after four minutes.	Sanity timer is enabled on the DELQA module.	Disable sanity timer. Refer to <i>DELQA-SA Option Installation Guide</i> .
Instead of automatically starting, system power-on results in >>> being displayed on the console terminal.	Break Enable/Disable <sup>2</sup> switch is set to enable. The system is in console mode.	To autoboot, set the Break Enable/Disable <sup>2</sup> switch (located on the CPU panel) to the disable position. Reset the system by pressing the Reset <sup>3</sup> button, located on the power supply.  If you prefer to boot manually from console mode, use the BOOT command (>>>BOOT <i>device-name</i> ).
The message "754 RETRY" displays on the console terminal twice.	No bootable media was found.	See actions listed in the subsequent sections of this table for the boot device you are using.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable.	The system cannot load system software from either a disk drive or a tape drive.	See actions listed in the subsequent sections of this table for the boot device you are using.
<b>Problems Booting from an RD-Series Fixed Disk</b>		
The countdown continues from 2 to 0; however, operating system error messages display on the console terminal.	The system disk is write-protected.	Release the write-protection on the disk. Make sure you know which Write-Protect button/switch corresponds to the disk containing system software. Refer to your system-specific <i>Operation</i> manual for instructions on operating your RD-series fixed disk.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The countdown does not continue from 2 through 0, even though the Halt Enable/Disable switch is set to disable. The message "?4D DEVOFFLINE" displays on the console terminal.	The system disk is offline.	Set the Ready button to the out position (glows green).
The countdown does not continue from 2 through 0, even though the Halt Enable/Disable switch is set to disable. The message "?42 NOSUCHFILE" displays on the console terminal.	The system disk contains no bootable system software.	Install system software.
The countdown does not continue from 2 through 0, even though the Halt Enable/Disable switch is set to disable. The message "?4C CTRL ERR" displays on the console terminal.	A problem exists with the controller or fixed disk.	Run the MDM software as described in Chapter 3.

**Problems Booting from an RA60 Removable Disk Drive**

The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The system cannot load system software from the RA60 disk.	The system disk is write-protected. The Write-Protect button is in (lit).	Push in and release the Write-Protect button to the out position. Make sure you know which Write-Protect button corresponds to the disk containing system software.
	The disk is not spun-up. The Run/Stop button on the disk drive control panel was not set to the in position.	Set the Run/Stop button on the disk drive control panel to the in position. Open the front door of the cabinet and press the Reset <sup>3</sup> button on either power supply.
	The RA60 drive door is unlocked.	Close the RA60 drive door and make sure the lock release button is out.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
	The disk drive circuit breaker is tripped.	Press the Run/Stop button on the disk drive control panel to the out position. Reset the circuit breaker on the disk drive by pushing it down, then up again. Press the Run/Stop button to the in position. Press the Reset <sup>3</sup> button on either power supply.
	A problem exists with the controller or fixed disk.	Run the MDM software as described in Chapter 3.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?4D DEVOFFLINE" displays on the console terminal.	The RA60 is off-line. Neither the A nor the B button on the disk drive control panel was set to the in position when the system was turned on.	Set the appropriate port button, A or B (or both), on the disk drive control panel to the in position. Press the Reset <sup>3</sup> button on either power supply.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?42 NOSUCHFILE" displays on the console terminal.	The system disk contains no bootable system software.	Install system software.
The Fault light is lit. The message "?4C CTRL ERR" displays on the console terminal.	A problem exists with the controller or fixed disk.	Press the Fault button twice. RA60 lights and indicators may begin to flash. If the RA60 lights and indicators do not flash or stop flashing, your system may have corrected itself. Run the MDM software as described in Chapter 3. If RA60 lights and indicators continue to flash, there is a problem with the controller or fixed disk. Call your DIGITAL service representative.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>Problems Booting from an RA80-Series Fixed Disk</b>		
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The system cannot load system software from a fixed disk.	The system disk is write-protected. The Write-Protect button is in (lit).	Push in and release the Write-Protect button to the out (unlit) position. Make sure you know which Write-Protect button corresponds to the disk containing system software.
	The disk is not spun-up. The Run/Stop button on the disk drive control panel was not set to the in position.	Set the Run/Stop button on the disk drive control panel to the in position. Open the front door of the cabinet and press the Reset <sup>3</sup> button on either power supply.
	The disk drive circuit breaker is tripped.	Press the Run/Stop button on the disk drive control panel to the out position. Reset the circuit breaker on the disk drive by pushing it down, then up again. Press the Run/Stop button to the in position. Press the Reset <sup>3</sup> button on either power supply.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?4D DEVOFFLINE" displays on the console terminal.	A problem exists with the controller or fixed disk.	Run the MDM software described in Chapter 3.
	The RA80 is off-line. Neither the A nor the B button on the disk drive control panel was set to the in position when the system was turned on.	Set the appropriate port button, A or B (or both), on the disk drive control panel to the in position. Press the Reset <sup>3</sup> button on either power supply.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?42 NOSUCHFILE" displays on the console terminal.	The system disk contains no bootable system software.	Install system software.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The Fault light is lit. The message "?4C CTRL ERR" displays on the console terminal.	A problem exists with the controller or fixed disk.	Press the Fault button twice. RA80 lights and indicators may begin to flash. If the RA80 lights and indicators do not flash or stop flashing, your system may have corrected itself. Run the MDM software as described in Chapter 3. If RA80 lights and indicators continue to flash, there is a problem with the controller or fixed disk. Call your DIGITAL service representative.
<b>Problems Booting from an RA70 Fixed Disk</b>		
The countdown continues from 2 through 0, however, operating system error messages display on the console terminal.	The system disk is write-protected. The Write-Protect button is in (lit).  The system disk contains no bootable system software.	Push in and release the Write-Protect button to the out (unlit) position. Make sure you know which Write-Protect button corresponds to the disk containing system software.  Install system software.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?4D DEVOFFLINE" displays on the console terminal.	The RA70 is off-line. Neither the A nor the B button on the disk drive control panel was set to the in position when the system was turned on.  The RA70 has not finished self-tests.	Set the appropriate port button, A or B (or both), on the disk drive control panel to the in position. Press the Reset <sup>3</sup> button on either power supply.  Wait until the Ready light comes on and press the Reset button <sup>3</sup> on either power supply.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable. The message "?42 NOSUCHFILE" displays on the console terminal.	The system disk contains no bootable system software.	Install system software.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The Fault light is lit. The message "74C CTRL ERR" displays on the console terminal.	A problem exists with the controller or fixed disk.	Press the Fault button twice. RA70 lights and indicators may begin to flash. If the RA70 lights and indicators do not flash or stop flashing, your system may have corrected itself. Run the MDM software as described in Chapter 3. If RA70 lights and indicators continue to flash, there is a problem with the controller or fixed disk. Call your DIGITAL service representative.

**Problems Booting from an RA90 Fixed Disk**

Problems with the RA90 drive are indicated by the Fault indicator on the front panel of the drive. If the Fault indicator lights, or if no front panel activity occurs at power-up, select the Fault switch on the drive's front panel. When you select the Fault switch, a fault code should display on the control panel.

0F displays when you select the Fault switch.	The drive is write protected.	Disable the write protection by deselecting the Write-Protect switch at the RA90 control panel or turn off software write protection.
22 displays when you select the Fault switch.	The drive is overheated.	Spin down and remove power from the drive. Ensure the front filter is clean and that room temperature is within recommended limits. Call your DIGITAL service representative if the filter or temperature has not caused the overheating.
2D displays when you select the Fault switch.	The drive is overheated.	Spin down and remove power from the drive. Ensure the front filter is clean and that room temperature is within recommended limits. Call your DIGITAL service representative if the filter or temperature has not caused the overheating.
6F displays when you select the Fault switch.	There is a write-protect error.	Disable the write protection by deselecting the Write-Protect switch at the RA90 control panel or turn off software write protection.
A fault code other than those described above displays when you select the Fault switch.		Call your DIGITAL service representative.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>Problems Booting from an RF-Series Integrated Storage Element (ISE)</b>		
The countdown continues from 2 through 0, however, operating system error messages display on the console terminal.	The system disk is write-protected. The Write-Protect button is in (glows orange).	Push in and release the Write-Protect button to the out (unlit) position. Make sure you know which Write-Protect button corresponds to the system disk.
	The system disk contains no bootable system software.	Install system software.
The countdown does not continue from 2 through 0, even though the Break Enable/Disable <sup>2</sup> switch is set to disable.	The system disk is offline. (The Ready button is in the in position.)	Press the appropriate Ready button, 0, 1, or 2, to the out position. Press the Reset <sup>3</sup> button on either power supply.
The Fault light is lit or begins to flash.	A problem exists with the controller or ISE.	If the Fault light stops flashing, your system may have corrected itself. Run the MDM software as described in Chapter 3. If the Fault light remains lit, call your DIGITAL service representative.
<b>Problems Booting from an RX-Series Diskette Drive</b>		
System does not boot (the countdown does not continue from 2 to 0) or boots from another device (the wrong software displays on the console terminal).	No diskette in diskette drive.	Insert a diskette containing startable system software into the diskette drive.
	Diskette drive door or latch is not closed.	Close the diskette drive door or latch.
	Diskette is in the drive upside down.	<i>RX50 Diskette Drives:</i> Check that the orange arrow on the diskette matches the orange stripe on the drive. Refer to <i>Operation</i> for instructions on inserting and removing diskettes.  <i>RX33 Diskette Drives:</i> Check that the write-protect notch is at the bottom. Refer to <i>Operation</i> for instructions on inserting and removing diskettes.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 1-1 (Cont.): Troubleshooting Power-On Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
	Diskette is not bootable (does not contain a bootstrap program).	Use a diskette containing a bootstrap program to start system software.
	Diskette is worn or damaged.	Try another diskette.
<b>Problems Booting from a Tape Cartridge</b>		
System does not boot (the countdown does not continue from 2 to 0) or boots from another device (the wrong software displays on the console terminal).	No tape cartridge in the tape drive.	Insert a cartridge containing system software into the tape drive.
	Fixed-disk drive is on-line. Your system starts from the fixed disk, if it is on-line.	Place the fixed disk off-line.
	Tape is not bootable (does not contain a bootstrap program).	Use a tape containing a bootstrap program to start system software.
	Tape is worn or damaged.	Try another tape cartridge.
	A problem exists with the controller or tape drive.	Call your DIGITAL representative.



## Chapter 2

# Troubleshooting During Normal Operation

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Problems that occur during normal operation of your system may result from a defect in the system, from faulty settings, or from incorrect procedures.

Table 2-1 lists problems, possible causes, and corrective actions. If the actions listed do not solve the problem, call your DIGITAL service representative.

**Table 2-1: Troubleshooting Operation Problems**

Problem	Possible Cause	Corrective Action
<b>System Problems</b>		
System loses power during operation. The on/off switch is not lit.	The system has become unplugged.	Set the on/off switch to 0. Plug in the system. Set the on/off switch to 1.
	No power at the wall outlet.	Use a different wall outlet, or check the circuit breaker controlling power to the wall outlet.
	Circuit breaker(s) has tripped.	Set the on/off switch to 0. Reset the circuit breaker(s). <sup>1</sup> Set the on/off switch to 1. If the circuit breaker(s) trips again, call your DIGITAL service representative.
	Power cable is incorrectly installed.	Set the on/off switch to 0. Check that the cable is fully seated in the socket. Set the on/off switch to 1.
The system loses power during operation, but the on/off switch is lit.	The power supply has failed.	Check the DC OK light(s). An unlit DC OK light indicates a power supply problem. Turn off your system and call your DIGITAL service representative.

<sup>1</sup>Locate and reset the circuit breaker(s) on your system using the diagrams in Appendix A.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
System halts unexpectedly during normal operation. The console mode prompt >>> displays on the console terminal.	The <b>[Break]</b> key on the console terminal was pressed inadvertently.	Type "C" or "Continue" and press <b>[Return]</b> .  To prevent recurrences, set the Break Enable/Disable <sup>2</sup> switch on the CPU panel to the disable position and press the Reset <sup>3</sup> button to reset the system. Note that pressing Reset <sup>3</sup> causes the system to reboot.
<b>RA60/70/81/82 Disk Problems</b>		
<i>RA70 Fixed-Disk Drives:</i> Fixed-disk write error message displays.	Disk is write-protected. (Write-Protect button glows orange).	Press and release Write-Protect button (not lit).
The Fault light is lit.	A problem exists with the controller or disk drive.	Run the MDM software described in Chapter 3. Call your DIGITAL service representative.
<i>RA60/80-Series Devices:</i> The Fault light is lit.	A problem exists with the controller or disk drive.	Press the Fault button twice. Device lights and indicators may begin to flash. If the lights and indicators do not flash or stop flashing, your system may have corrected itself. To be certain that your system is operating correctly, run the MDM software described in Chapter 3. If lights and indicators continue to flash, there is a problem with the controller or disk drive. Call your DIGITAL service representative.
Fixed-disk read error message displays.	Disk is not spun-up because the Run/Stop button is in the out position (not lit).	Press the Run/Stop button to the in position (glows yellow) to spin up the drive. When the READY indicator comes on, the drive is available for use.
<b>RA90 Disk Problems</b>		
Problems with the RA90 drive are indicated by the Fault indicator on the front panel of the drive. If the Fault indicator lights, select the Fault switch on the drive's front panel. When you select the Fault switch, a fault code should display on the control panel.		
OF displays when you select the Fault switch.	The drive is write protected.	Disable the write protection by deselecting the Write-Protect switch at the RA90 control panel or turn off software write protection.

<sup>2</sup>MicroVAX II systems have a Halt Enable/Disable switch.

<sup>3</sup>MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
22 displays when you select the Fault switch.	The drive is overheated.	Spin down and remove power from the drive. Ensure the front filter is clean and that room temperature is within recommended limits. Call your DIGITAL service representative if the filter or temperature has not caused the overheating.
2D displays when you select the Fault switch.	The drive is overheated.	Spin down and remove power from the drive. Ensure the front filter is clean and that room temperature is within recommended limits. Call your DIGITAL service representative if the filter or temperature has not caused the overheating.
6F displays when you select the Fault switch.	There is a write-protect error.	Disable the write protection by deselecting the Write-Protect switch at the RA90 control panel or turn off software write protection.
A fault code other than those described above displays when you select the Fault switch.		Call your DIGITAL service representative.
<b>RD-Series Fixed-Disk Problems</b>		
Fixed-disk write error message displays.	Disk is write-protected.	Release the write protection for the disk. Refer to your system-specific <i>Operation</i> manual for instructions on operating your RD-series fixed disks.
Fixed-disk read error message displays.	<i>MicroVAX II Systems:</i> Disk is off-line because the Ready button is in (not lit).	Press and release the Ready button (glows green) to put fixed disk on-line.
<b>RF-Series Integrated Storage Element (ISE) Problems</b>		
ISE write error message displays.	ISE is write-protected. (Write-Protect button glows orange).	Press and release Write-Protect button (not lit).
The Fault light is lit or begins to flash.	A problem exists with the controller or ISE.	If the Fault light stops flashing, the system may have corrected itself. Run the MDM software as described in Chapter 3. If the Fault light remains lit, call your DIGITAL service representative.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
ISE read error message displays.	ISE is not spun-up because the Ready button is in the in position.	Press the Ready button to the out position. When the green indicator light comes on, the ISE is available for use.
<b>RX-Series Diskette Drive Problems</b>		
Diskette read error message displays.	No diskette in the diskette drive.	Insert a diskette into the drive.
	Diskette drive door or latch is not closed.	Close the diskette drive door or latch.
	Diskette is in the drive upside down.	<i>RX50 Diskette Drives:</i> Check that the orange arrow on the diskette matches the orange stripe on the drive. Refer to your system-specific <i>Operation</i> manual for instructions on inserting and removing diskettes.  <i>RX33 Diskette Drives:</i> Check that the write-protect notch is at the bottom. Refer to your system-specific <i>Operation</i> manual for instructions on inserting and removing diskettes.
	Diskette is not formatted.	Use a preformatted RX50 diskette.
	Diskette is worn or damaged.	Try another diskette.
Diskette write error message displays.	No diskette in the diskette drive.	Insert a diskette into the drive.
	Diskette drive door or latch is not closed.	Close the diskette drive door or latch.
	Diskette is in the drive upside down.	<i>RX50 Diskette Drives:</i> Check that the orange arrow on the diskette matches the orange stripe on the drive. Refer to your system-specific <i>Operation</i> manual for instructions on inserting and removing diskettes.  <i>RX33 Diskette Drives:</i> Check that the write-protect notch is at the bottom. Refer to your system-specific <i>Operation</i> manual for instructions on inserting and removing diskettes.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
	Diskette is not formatted.	Use a preformatted RX50 diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Remove the write-protect tab.
<b>TK70 Tape Drive Problems</b>		
Green light blinks rapidly after you insert the tape.	Tape cartridge leader is defective.	Pull the handle open and remove the cartridge. Use another cartridge.
Orange, yellow, and green lights blink in unison.	A problem with the drive.	Press the Unload button once. If the orange and green lights go out and the yellow light blinks, the cartridge is unloading. When the green light comes on and you hear the beep, remove the tape cartridge. If all three lights continue to blink after you press the Unload button, the fault is not cleared. Do not try to remove the cartridge. Call your DIGITAL service representative.
Handle does not move.	Power-on test is still in progress.	If you are trying to insert a cartridge, wait for the orange and yellow lights to go off and the green light to remain on steadily. Then try again.
	Tape drive is active.	Do not attempt to move the handle while the yellow light is on.
Handle does not lock.	Cartridge is not inserted properly.	Reinsert the tape cartridge. If the problem persists, call your DIGITAL service representative.
Cartridge does not unload.	Unload button is not working properly.	Try unloading the cartridge with a software command. Refer to your system software manuals.
TK70 passes power-on self-test but does not work.	The controller may be bad, or the connection between the drive and the controller may be loose.	Call your DIGITAL service representative.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>TK50 Tape Drive Problems</b>		
TK50 red light blinks rapidly, but no unusual sounds occur.	A problem exists in the tape drive.	Press the Load/Unload button four times. If the problem persists, do not attempt to use the tape drive or to remove the tape cartridge, if loaded. Call your DIGITAL service representative.
Red light blinks rapidly and you hear a whirring sound.	Leaders are not coupled properly.	Immediately turn off the system by setting the on/off switch to 0 (off). Call your DIGITAL service representative. Do not attempt to remove the cartridge.
Cartridge release handle does not move.	Power-on test is still in progress.	If you are trying to insert a cartridge, wait for the red light to go out and the green light to remain on steadily, then try again.
	Tape drive is active.	Do not attempt to move the handle until the red light is off and the green light is on steadily.
Cartridge release handle does not lock.	Cartridge is not inserted properly.	Reinsert the tape cartridge. If the problem persists, call your DIGITAL service representative.
Cartridge does not unload.	Load/Unload button is in the load (in) position.	Make sure the Load/Unload button is in the unload (out) position. Wait for the red light to go out and the green light to remain on steadily before trying to remove the cartridge.
	Load/Unload button is not working properly.	If you are trying to remove a cartridge, try loading and unloading the cartridge again. Set the Load/Unload button to the load (in) position for a few seconds, then press it again to the unload (out) position. Move the cartridge release handle only after the red light goes off and the green light comes on. If the problem persists, call your DIGITAL service representative.
TK50 passes power-on self-test but does not work.	The controller may be bad, or the connection between the drive and the controller may be loose.	Call your DIGITAL service representative.

**Table 2-1 (Cont.): Troubleshooting Operation Problems**

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>TSV05 and TU81-Plus Tape Drive Problems</b>		
The drive does not power up.	The circuit breaker(s) has tripped.	Set the on/off switch to 0. Reset the circuit breaker(s). <sup>1</sup> Set the on/off switch to 1. If the circuit breaker(s) trips again, call your DIGITAL service representative.
	The switch on the power controller is set to B.	Set the switch to A.
	No power at the wall outlet.	Use a different wall outlet or check the circuit breaker controlling power to the wall outlet.
	The system has become unplugged.	Set the on/off switch to 0. Plug in the system. Set the on/off switch to 1.

<sup>1</sup>Locate and reset the circuit breaker(s) on your system using the diagrams in Appendix A.



## Running the MicroVAX Diagnostic Monitor (MDM)

---

The MicroVAX Diagnostic Monitor (MDM) is a software package containing diagnostic tests designed to isolate and identify faults in your MicroVAX system. MDM also permits you to display your system configuration, reformat disks, and, if your system has two or more megabytes of memory, test how devices work together. The diagnostic tests are packaged with your system on either RX50 diskettes (labeled MV DIAG CUST RX50) or a tape 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 three situations:

- Before you install system software on a new system
- When you receive an error message or experience a problem with your system
- When you want to test your system periodically to ensure that all components are operating correctly

### How the MDM Tests Work

MDM tests individual devices in your system. However, MDM performs limited diagnostics:

- It performs reads from each drive and checks each controller. The customer tests do not write to the drives as writing to the drives could destroy data.

**NOTE:** *MDM will test a tape drive or diskette drive only when the media (tape or diskette) is inserted in the drive.*

- It checks only devices themselves and not the connections or lines between peripheral devices and the system.

- It does not check each device as thoroughly as the service diagnostic tests, which are described below.

If devices pass the customer tests but you still experience problems, contact a DIGITAL service representative for further testing.

Customers requiring more complete diagnostic testing should purchase the MicroVAX Maintenance Kit. The maintenance kit includes the system maintenance guide and the service diagnostic tests. The MDM version that you receive with your system is a subset of the service version.

**NOTE:** *Only qualified service personnel should use the service diagnostic tests.*

### **3.1 Running MDM Under Special Circumstances**

Running MDM for certain systems requires additional or special procedures. Read the appropriate section if you plan to run MDM on a diskless and tapeless system, a VAXserver 3602 system, a dual-host system, or if you plan to install MDM on a hard disk or RF-series Integrated Storage Element (ISE).

#### **3.1.1 Running MDM on Diskless and Tapeless Systems**

If you have a diskless and tapeless system that is part of a local area network (LAN), you must obtain the MicroVAX Ethernet Server Customer Diagnostics Kit. Run MDM using the diagnostics in the kit that is labeled MV DIAG ENET CUST.

Refer to the *MicroVAX Diagnostic Monitor Ethernet Server User's Guide* at this time. Once you have installed and down-line loaded MDM software, refer again to this manual for specific instructions on running MDM.

**NOTE:**

1. *If you have a diskless and tapeless system that is not part of a local area network (LAN), you cannot run MDM. To diagnose problems, call a DIGITAL service representative.*
2. *If your system is part of a local area network (LAN), you may want to reduce the time required to load MDM on each system by obtaining the MicroVAX Ethernet Server Customer Diagnostics Kit. The kit enables you to install MDM software on a host VMS operating system and down-line load MDM to other systems that are part of the LAN, using the DECnet/Ethernet network facilities. When MDM is down-line loaded*

*to target systems from a host system, the time required to load MDM is reduced significantly.*

### **3.1.2 Running MDM on a VAXserver 3602 System**

If you have a VAXserver 3602 system, the CPU in the secondary cabinet cannot boot diagnostic software from a tape cartridge. You must down-line load the diagnostic software from the primary cabinet.

The MicroVAX Ethernet Server Customer Diagnostics Kit contains the MDM diagnostic software and a *MicroVAX Diagnostic Monitor Ethernet Server User's Guide*. The user's guide describes how to install MDM software on a host VMS or MicroVMS operating system and how to down-line load MDM to a diskless target system, using the DECnet/Ethernet network facilities.

### **3.1.3 Installing MDM on RF-series ISE or Hard Disk**

MDM software can be installed on an RF-series ISE or an RA-, RD-series hard-disk drive using the MDM Hard Disk Kit. Installation of the MDM Hard Disk Kit requires the completion of the "Diagnostic Software Installation Acknowledgment" by the customer. See the *MicroVAX Diagnostic Monitor Hard Disk User's Guide* for the licensing requirements and installation instructions.

**NOTE:** *The MDM Hard Disk Kit is required for dual-host systems where one host is a tapeless system.*

### **3.1.4 Running MDM on a Dual-Host System**

In a dual-host configuration, two MicroVAX systems in the same VAXcluster share their ISEs through a Digital Storage System Interconnect (DSSI) bus. Each system can directly access any of the ISEs in either system; this can include a shared common system disk.

Before running MDM diagnostics on a dual-host system, your system must be properly configured (systems ordered as dual-host systems are properly configured at the factory) and the DSSI cable connecting the two hosts must be in place.

Diagnostics must be performed separately for each host. The procedure for running diagnostics differs depending on whether one host is a tapeless system (no tape drive) or each host has its own tape drive. Use the instructions in Section 3.1.4.1 to run diagnostics in a dual-host system with one tape drive. Use the instructions in Section 3.1.4.2 to run diagnostics in dual-host systems with a tape drive in each host.

### 3.1.4.1 Running MDM on a Dual-Host System with One Tape Drive

Dual-host systems with one tape drive (one tapeless host) require the MDM Hard Disk Kit. Complete the "Diagnostic Software Installation Acknowledgment" and install the kit on an RF-series ISE according to the procedure in the *MicroVAX Diagnostic Monitor Hard Disk User's Guide*.

**NOTE:** *MicroVAX II systems have a Restart button on the front panel, rather than a Reset button; and a Halt Enable/Disable switch, rather than a Break Enable/Disable switch. The text refers to the switches as the Reset switch and the Break Enable/Disable switch.*

When the installation is complete, use the following procedure to run the diagnostics:

1. Set the Break Enable/Disable switch on both hosts' CPU panels to enable (up, dot inside the circle). Turn on both hosts. If the hosts are already powered-up, press **BREAK**.

*Result:* You should see the >>> prompt indicating console mode on your terminal.

2. Use the command `BOOT/100 DIAn` (for KA640 CPU based DSSI) or `BOOT/100DUAn` (for KFQSA based DSSI), where n is the unit number of the disk containing the MDM Hard Disk Kit.

*Result:* The system prompts for the bootfile:

Bootfile:

Enter the name of the file image: `[SYS0.SYSEXE]MDMDIA.SYS` for systems with on-board DSSI, or `[SYS0.SYSEXE]MDM.SYS` for systems using the KFQSA storage adapter. Press **RETURN** to continue booting.

3. Run the diagnostics as described in this chapter.
4. When you have completed the tests on the first host, make sure the Break Enable/Disable switch is set to enable (up, dot inside the circle) and press the Reset button on that same host. When the countdown completes and the >>> prompt appears, boot the diagnostics from the second host using the commands described in steps 2 and 3, and run the diagnostics as you did for the first host.

### 3.1.4.2 Running MDM on a Dual-Host System with Two Tape Drives

Run diagnostics on dual-host systems with two tape drives according to the following procedure:

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

1. If software is installed on the system, warn all users to log off and perform system shutdown, as described in your system software manuals. Turn off both hosts.
2. Make sure the Write-Protect switch on the tape cartridge containing the MDM diagnostics is in the write-protect position.
3. Set the Break Enable/Disable switch on both hosts' CPU panels to enable (up, dot inside the circle).
4. Turn on both hosts.

*Result:* The normal power-on countdown should appear on the console terminal. After the countdown, you should see the >>> prompt indicating console mode.

5. Insert the tape cartridge containing the MDM software into the tape drive in one host system and lock it into place. For the same host, use the command `BOOT MUA0` to tell your system to load the MDM software from the tape cartridge.
6. Run the diagnostics as described in this chapter.
7. When you have completed the tests on the first host, remove the tape cartridge by following the procedure described in your system-specific *Operation* manual. Press the Reset button on that same host. When the countdown completes and the >>> prompt appears, insert the tape cartridge into the tape drive in the second host and lock it into place. Use the command `BOOT MUA0` to boot the tape and run the diagnostics as you did for the first host.

## 3.2 Starting MDM

### CAUTION:

**Before you run the MDM software:**

- *Be sure you understand the instructions in your system-specific Operation manual (contained in this documentation kit) for using the device appropriate for your diagnostic media — either the RX50 diskette drive or the TK50/TK70 tape drive.*

- *Make sure the media (tape cartridge or RX50 diskette) is write-protected.*

You must start the diagnostic tests differently for different media. If you are booting MDM from an RX50 diskette, read Section 3.2.1. If you are booting MDM from a tape cartridge, read Section 3.2.2. If you are booting MDM from an RF-series ISE or an RA-, RD-series fixed-disk drive, refer to the *MicroVAX Diagnostic Monitor Hard Disk User's Guide*.

**NOTE:** *Unless instructed to do so, do not change any settings or manipulate devices while the tests are running. The diagnostic software interprets any change of state as an error.*

**NOTE:** *If you are using an RX33 diskette drive, follow the instructions for running MDM from RX50 diskettes.*

### **3.2.1 RX50 Diskette Instructions**

Because the system automatically boots first from an RX50 diskette, you can run MDM software whether or not the system software has been installed on the system.

**CAUTION:** *Before booting MDM on a system with software installed, warn all users to log off and perform system shutdown, as described in your system software manuals.*

To run diagnostic software from RX50 diskettes, do the following:

1. Make sure the Halt Enable/Disable switch is set to disable (down).
2. Set the fixed-disk 0 Ready button on the system control panel to the out position.
3. Insert diskette RX50A into one of the drives (be careful to align the orange arrow on the diskette with the orange stripe on the drive) and close the door.
4. Press the Restart button if the system is running, or turn on the system if the system is off.

*Result:* A countdown from 7 to 3 should appear on the console terminal as the system performs self-tests. The countdown continues from 2 to 0 as the system loads the diagnostic software.

5. At this point, you may be prompted to remove diskette RX50A and insert the next boot diskette. Remove diskette RX50A and insert diskette RX50B.

*Result:* Within a few moments you should see the MDM introductory display.

6. Make sure the current date and time in the introductory display are correct. If the date and time are correct, press **[Return]** to continue. If incorrect, type the correct date and time, using the format shown in the MDM introductory display screen. For example, enter 25-DEC-1988 02:30 and press **[Return]** to continue.

*Result:* Within moments the Main Menu appears. Section 3.3 describes options on the Main Menu.

7. When you select a menu option, you may be asked to insert additional diskettes. Insert the specified diskettes when prompted by the system. If your system does not request all the diskettes containing diagnostic software, your configuration does not need the additional diskettes for testing.

*Result:* After a few minutes, you receive a message that the various diagnostics are configuring and that the system is ready for testing.

When you press **[Return]**, the selected option will continue.

### 3.2.2 TK50/TK70 Instructions

The diagnostics run the same way whether or not system software, such as VMS, ULTRIX-32, or VAXELN, has been loaded. You can manually boot the diagnostic software or use the autoboot feature to automatically boot the software. The following sections explain how to boot MDM manually and automatically, as well as how to boot MDM on VAXserver 3602 systems. Carefully follow the directions for setting switches.

**NOTE:** Before running MDM on your TK50 or TK70 tape drive, you may want to reread the tape drive operating instructions found in your system-specific Operation manual.

#### 3.2.2.1 Booting MDM Manually

**NOTE:** Before booting MDM on a system with software installed, warn all users to log off and perform system shutdown, as described in your system software manuals.

1. Make sure the Write-Protect switch on the tape cartridge is in the write-protect position.
2. If your system contains system software, write-protect all disk drives and RF-series ISEs.

3. Move the Break Enable/Disable switch on the CPU panel to enable (up, dot inside the circle).
4. Press the Reset button if the system is running or turn on the system if the system is off.
5. When the green light on the tape drive glows steadily (if you are using a TK70 tape drive, orange and yellow lights go out), insert the tape cartridge containing the MDM software into the tape drive and lock it into place.

If you are using a TK50 tape drive, press the Load/Unload button to the load (in) position.

*Result:* While you are inserting and loading the tape cartridge, the normal power-on countdown should appear on the console terminal. After the countdown, you should see the >>> prompt indicating console mode.

6. Use the command `BOOT MUA0` to tell your system to load the MDM software from the tape cartridge. Loading the software takes several minutes. An indicator light on the tape drive flashes while loading occurs. (If you are using a TK50 tape drive, a green light flashes. If you are using a TK70 tape drive, a yellow light flashes.) Section 3.2.2.4 describes the display you see when loading is completed.

### 3.2.2.2 Booting MDM Using Autoboot

**NOTE:** *Before booting MDM on a system with software installed, warn all users to log off and perform system shutdown, as described in your system software manuals.*

1. Make sure the Write-Protect switch on the tape cartridge is in the write-protect position.
2. Remove any removable disks and place all fixed-disk drives and RF-series ISEs off-line.
3. Write-protect all disk drives and RF-series ISEs.
4. Turn off your system.
5. Move the Break Enable/Disable switch on the CPU cover panel to disable (dot outside the circle).
6. Turn on your system.
7. When the green light on the tape drive glows steadily (if you are using a TK70 tape drive, orange and yellow lights go out), insert the tape cartridge containing the MDM software into the tape drive and lock it in place.

If you are using a TK50, press the Load/Unload button to the load (in) position.

*Result:* While the system loads MDM, the power-on countdown appears on the screen. Loading the software takes several minutes. An indicator light on the tape drive flashes while loading occurs. (If you are using a TK50 tape drive, a green light flashes. If you are using a TK70 tape drive, a yellow light flashes.)

Section 3.2.2.4 describes the display you see when loading is completed.

**NOTE:** *When loading is completed, place all RF-series ISEs on-line. If the ISEs are not on-line, they cannot be tested completely.*

### **3.2.2.3 VAXserver 3602 Systems**

You must run MDM software differently for each cabinet in the VAXserver 3602 system. To run MDM in the primary cabinet, follow the instructions in either of the previous two sections. To run MDM in the secondary cabinet, you must load the Ethernet server diagnostic software into the primary cabinet and down-line load it to the secondary cabinet.<sup>1</sup> The Ethernet server diagnostic software is supplied with your system on a tape cartridge labeled MV ENET CUST DIAG. Instructions for down-line loading the software to the secondary cabinet are in the *MicroVAX Diagnostic Monitor Ethernet Server User's Guide* supplied with your system.

### **3.2.2.4 MDM TK50/TK70 Introductory Screen**

When MDM software is loaded, the MDM introductory screen displays. Make sure the current date and time in the introductory display are correct. If the date and time are correct, press **[Return]** to continue. If incorrect, type the correct date and time, using the format shown in the MDM introductory screen display. For example, enter 25-DEC-1988 02:30 and press **[Return]** to continue. The Main Menu appears. Section 3.3 describes options on the Main Menu.

---

<sup>1</sup> To run MDM in the secondary cabinet, the VMS or ULTRIX operating system must be installed in the primary cabinet.

### 3.3 Main Menu Options

The Main Menu has six options, as shown in Figure 3-1. Choose an option by typing the number and pressing **[Return]**.

**Figure 3-1: The Main Menu**

```
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 in the sample screens provided throughout this chapter.*

Option 4, "Display the Service Menu," is available only if you have purchased the MicroVAX Maintenance Kit. The maintenance kit contains service diagnostics and the system maintenance guide. Only qualified service personnel should use the MicroVAX Maintenance Kit.

The next five sections describe the remaining options on the Main Menu.

#### 3.3.1 Test the System

The "Test the System" option runs a quick, general test of the devices in the system and how they work together. You can run the test at any time without jeopardizing data.

When you select "Test the System," the diagnostics are prepared for testing. If this is the first MDM option you have selected, the diagnostics are automatically loaded. The loading process takes several minutes. When the preparations and loading are complete, you are prompted to press **[Return]**. A screen explaining the testing procedures then appears.

When you are ready to begin the test, press **[Return]**. The "Begin Device Tests" screen appears.

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

**NOTE:** *Because of the internal similarity of some communications options, the diagnostic test sees these options as the same device. A DHV11 and DHQ11 appear the same to the diagnostic test. A generic device name, DH-CX0, is listed for similar communications options. The last letter in each device name differentiates among multiple devices of the same type. For example, DH-CX0A indicates one communications option, DH-CX0B a second, and so forth.*

If a device fails the test, you receive a failure message.

Each failure message identifies the device being tested, when the failure occurred, and the field replaceable unit (FRU). Copy the failure message and report it to your DIGITAL service representative. Figure 3-2 shows an example of an unsuccessful test.

**Figure 3-2: Example of an Unsuccessful Test**

```
BEGIN FUNCTIONAL TEST
```

```
Device                      Result
DEQNAA ..... FAILURE DETECTED
A failure was detected while testing the
      OPTION: DEQNAA Ethernet controller
The Field Replaceable Unit (FRU) identified is the:
      Ethernet controller
```

If your system has serious problems, the following message may appear:

All devices disabled, no tests run.

Report the message to your DIGITAL service representative.

When a failure message occurs, the testing stops.

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

At the end of the system test, press **Return** to return to the Main Menu. From the Main Menu you can either exit MDM by pressing the Reset button, or pressing and then releasing the Halt button, or you can choose one of the other options.

### 3.3.2 Display System Configuration and Devices

The "Display System Configuration and Devices" screen identifies devices recognized by the diagnostic software.

When you select "Display System Configuration and Devices," the diagnostics are prepared for testing. If this is the first MDM option you have selected, the diagnostics are automatically loaded. The loading process takes several minutes. When the preparations and loading are complete, you are prompted to press **[Return]**.

When you press **[Return]**, the configuration is displayed. Figure 3-3 shows a sample system configuration and devices screen.

**Figure 3-3: System Configuration and Devices Screen**

```
MAIN MENU                               Release nnn   Version xx.xx
SYSTEM CONFIGURATION AND DEVICES

CPUA ... MicroVAX/rtVAX CPU
      KA630-AA 1MB, FPU MC=00 HW=00
MEMA ... MicroVAX II Memory System
      5 megabytes. 10240 Pages.
      KA630 ... M7606-AA/EA CPU module with 1MB on-board memory
      KA630-BB ... M7608-BA (MS630-BB) Memory module, quad height 4mb
RQDXA ... Winchester/diskette controller.
      Revisions = 2 and 1
      RD53 ... Unit #0, Nonremovable, Write protected
DEQNAA ... Ethernet controller
      DEQNA Q 08-00-2B-03-AC-DF
DZQ11A ... Asynchronous line controller.
DH-CXOA ... CXA16/CXB16/CXF32/DHF11 - 16 lines, No Modem control
      ROM Rev: CONTROL = 16 OCTART = 1
TKXXA ... TK50/TK70 CONTROLLER
      TK-Q_REV MC=4
```

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 and/or microcode. For example, the KA630 CPU described in Figure 3-3 is at revision 0 for microcode (MC=00) and revision 0 for hardware (HW=00).

Besides the general information listed for each device, additional information for specific devices is listed as follows:

- CPU — Type of CPU, presence of a floating-point unit (FPU).
- MEM — Total amount of memory in megabytes and pages, number and type of memory modules:
- KFQSA — For systems with the KFQSA storage adapter, the type of DSSI device and its unit number are displayed for each ISE.
- DSIA — For systems with the KA640 CPU, the type of DSSI device and its unit number are displayed for each ISE.
- RQDX — Type, unit number, and description of each mass storage device connected to the controller.
- DELQA, DEQNA, or DESQA — The Ethernet station address.
- NIA — The onboard Ethernet controller for systems with the KA640 CPU.
- Communications devices — The 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 physically present in the system but is not described under the "System Configuration and Devices" display, one of the following two messages can indicate the reason.

**Message 1:**

No Dg KAA ... Diagnostic not loaded

The "No Dg" (no diagnostic) "KAA" (KA630 CPUA) message appears in place of the device name because a diagnostic was not loaded for the CPUA. This can happen when the media is not installed properly or the diagnostic is not present on the media.

MDM displays a "No Dg" message for each DIGITAL device present in the system under these circumstances. For example, if MDM cannot find the TK70 tape drive diagnostic, the message "No Dg TKA" appears. TKA indicates that the device is a TK tape drive.

## Message 2:

Unknown ... Diagnostic not loaded

The "Unknown" (unknown device) message indicates that a device not recognizable to MDM has been attached to the system. The message appears under the following circumstances:

- A device is configured to a nonstandard CSR address.
- A DIGITAL device that has no diagnostic has been attached to the system. This may occur if a device not supported on a MicroVAX system has been attached.
- A non-DIGITAL device has been attached to the system.

Once all devices have been listed, you can return to the Main Menu by pressing **[Return]**.

To exit MDM, press **[Break]**, the Reset button, or press and then release the Halt button.

### 3.3.3 Display the System Utilities Menu

Choose "Display the System Utilities Menu" to display the System Utilities Menu. If system utilities in addition to the "IOADDRES" option are available for your system configuration, they are listed on the menu.

When you select this option, the diagnostics are prepared for testing. If this is the first MDM option you have selected, the diagnostics are automatically loaded. The loading process takes several minutes. When the preparations and loading are complete, you are prompted to press **[Return]**.

When you press **[Return]**, the System Utilities Menu appears. Figure 3-4 shows a sample System Utilities Menu for a system with an RQDX controller and two KRQ50 controllers.

**NOTE:** *If your system does not have an RQDX controller or an RRD40/50 Optical Disk Subsystem, only one option, IOADDRES, will be available.*

**Figure 3-4: Sample System Utilities Menu**

MAIN MENU  
SYSTEM UTILITIES

Utility selections are:

- 1 - IOADDRESS
- 2 - RXAA - Disk drive formatter for RQDX controller A.
- 3 - RRAA - Update drive unit number for RRD40 controller A.
- 4 - RRAB - Update drive unit number for RRD40 controller B.

Choose the option by typing the option number listed on the menu and pressing **[Return]**.

### 3.3.3.1 IOADDRESS

**NOTE:** *The "IOADDRESS" option is intended for users of Industrial VAX systems. This option is described in detail in the Industrial VAX Troubleshooting manual.*

The "IOADDRESS" option supplies a listing of standard Control and Status Register (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 supplied.

The devices in your system were configured properly at the factory. Any new options added to your system are configured properly in the field by a DIGITAL service representative.

### 3.3.3.2 Customer Disk Drive Formatter

**NOTE:** *RF-series Integrated Storage Elements are preformatted and cannot be formatted by the customer.*

If your system allows you to format RX33 diskettes, or to format fixed-disk drives, use the following guidelines to make formatting easier.

**CAUTION:** *Running the formatting utility destroys all data on the disk. Use this utility only if you want to erase the contents of a disk and reinstall system software.*

#### Formatting Instructions

If you are formatting an RX33 diskette, remove the diskette's Write-Protect tab, insert the diskette into the diskette drive, and lock the lever.

If you are formatting a fixed-disk drive, set the drive's Write-Protect button to write-enable (out).

When you are ready to begin formatting a diskette or a fixed-disk drive, proceed with the following instructions:

1. To begin the formatting operation, choose the "Customer disk drive formatter" option from the Systems Utilities menu. Write-protect all drives except the one you want to format.

2. Type 1 and press **[Return]** when you are ready to continue.

*Result:* A list of the unit numbers for the drives appears.

3. You are prompted to enter the unit number of the drive you want to format. Type the number and press **[Return]**. Verify that you have entered the unit number of the drive that you want to format.

4. If the unit number is incorrect, type 0, press **[Return]**, and re-enter the unit number. If the unit number is correct, type 1 and press **[Return]**. The formatting operation begins.

*Result:* As the operation progresses, you receive status messages. At the completion of a successful formatting operation, a success message is displayed.

5. If you want to format another unit, type 1 and press **[Return]**. The formatting process will begin again. For example, if you want to format another RX33 diskette, remove the diskette that you have formatted, insert another diskette, and repeat the process from step 3. Otherwise, type 0 and press **[Return]**. The Utilities Menu displays.

6. To return to the MDM Main Menu, type 0 and press **[Return]**.

To exit MDM, press **[Break]**, the Reset button, or press and then release the Halt button.

### 3.3.3.3 Update Drive Unit Number for RRD40

This utility allows you to update the unit number for the RRD40 compact-disk subsystem. Refer to the *RRD40 Disk Drive Owner's Manual* for instructions.

### 3.3.4 Display the Connect/Ignore Menu

**NOTE:** *The "Connect/Ignore Menu" is intended for users of Industrial VAX systems. The options in this menu are described in detail in the Industrial VAX Troubleshooting manual.*

The "Connect/Ignore Menu" options allow you to customize MDM diagnostics. You can load your own diagnostics to a particular device, as well as load MDM diagnostics to a device with a nonstandard CSR address and interrupt vector.

### 3.3.5 Select Single Device Tests

The "Select Single Device Tests" option allows you to run tests for a single device. A test of the device's individual circuits, called a "functional test," is performed during the single device tests. The functional test is followed by an "exerciser test" to ensure that the device as a whole is working properly.

When you select the Single Device Tests from the Main Menu, the diagnostics are prepared for testing. If this is the first MDM option you have selected, the diagnostics are automatically loaded. The loading process takes several minutes.

When the preparations and loading are complete, you are prompted to press **Return**. A screen listing the devices included in your system displays. Figure 3-5 shows an example of such a display.

**Figure 3-5: The Single Device Tests Menu**

```
MAIN MENU                               Release nnn   Test  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 - MicroVAX/rtVAX CPU
2 - MEMA - MicroVAX II Memory System
3 - RQDXA - Winchester/diskette controller.
4 - DEQNAA - Ethernet controller
5 - DZQ11A - Asynchronous line controller.
6 - DH-CXOA - CXA16/CXB16/CXF32/DHF11-16 lines, No Modem control
7 - TKXXA - TK50/TK70 CONTROLLER
```

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 internal similarity of some communications options, the diagnostic tests see these options as the same device. A DHV11 and DHQ11 appear the same to the diagnostic test. A generic device name, DH-CX0, is listed for similar communications options. The last letter in each device name differentiates among multiple devices of the same type. For example, DH-CX0A indicates one communications option, DH-CX0B a second, and so forth.*

Select a device for testing by typing the corresponding number and pressing **Return**.

When you press **[Return]**, the system loads the device diagnostics and testing begins. When the device passes the functional test, a message to that effect displays, and the exerciser test begins. The exerciser tests run for approximately four minutes. Figure 3-6 shows an example of a successful test.

**Figure 3-6: Example of a Successful Test**

```
BEGIN FUNCTIONAL TEST
      Device                      Result
      CPUTA ..... 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. Each failure message identifies the device being tested when the failure occurred and the field replaceable unit (FRU). Copy the failure message and report it to your DIGITAL service representative. Figure 3-7 shows an example of an unsuccessful test.

**Figure 3-7: Example of an Unsuccessful Test**

```
BEGIN FUNCTIONAL TEST
      Device                      Result
      DEQNAA ..... FAILURE DETECTED
      A failure was detected while testing the
      OPTION: DEQNAA Ethernet controller
      The Field Replaceable Unit (FRU) identified is the:
      Ethernet controller
```

Press **[Return]** to return to the Single Device Menu for more testing.

To exit MDM, press **[Break]**, the Reset button, or press and then release the Halt button.

### 3.3.6 Exiting MDM

Exit MDM by doing one of the following:

- Press **[Break]**.
- Press and then release the Halt button on the operator control panel.
- Press the Reset button.

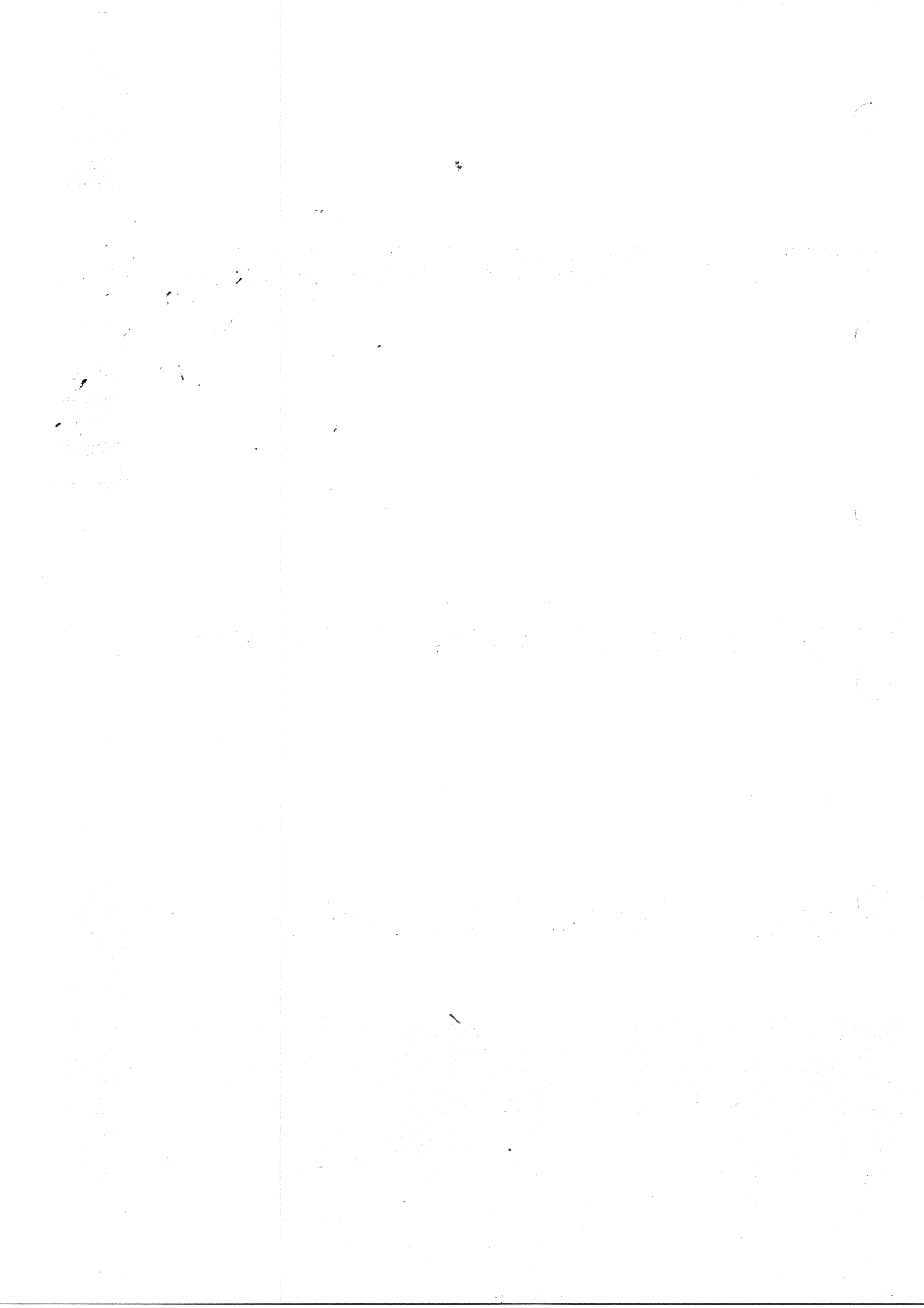
Remove the RX50 diskette or tape cartridge, as explained in your system-specific *Operation* manual.

If you have run MDM on a new system, you are ready to install your system software. Follow the instructions in your system software manuals. If you have used the Disk Formatter Utility to format a fixed disk or a diskette, you must reinstall system software. Set the Write-Protect button to write-enabled and install system software.

If you have run MDM on a system containing system software, you must reboot your system software.

You can reboot your system software in two ways.

- At the console mode prompt `>>>`, use the command `BOOT Dxxx`, where `Dxxx` is the device name of the fixed disk or RF-series ISE containing your system software. (Use `DUxx` if this is an RD-series disk drive, `RA-` series disk drive, or an RF-series ISE (with the KA640 CPU). Use `DIxx` if this is an RF-series ISE (with the KFQSA storage adapter.)) After the system software is loaded, set the Break Enable/Disable switch to disable, indicated by the dot outside the circle, to avoid inadvertently halting the system by pressing the **[Break]** key.
- Set the Break Enable/Disable switch to disable and press the Reset button. This causes your system to begin the power-on sequence again and automatically load system software.



## Appendix A

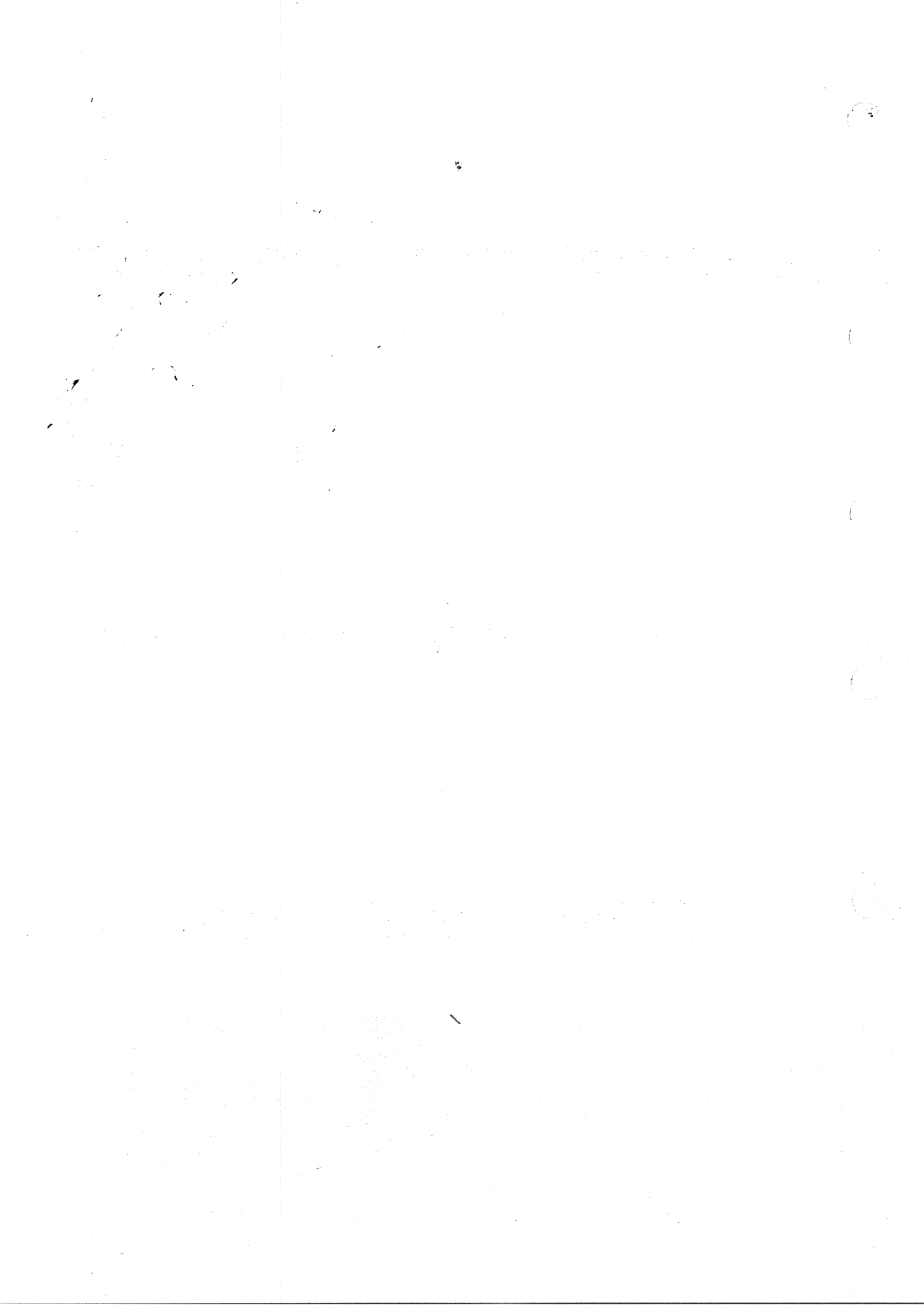
# Diagrams for Locating Controls on Your MicroVAX System

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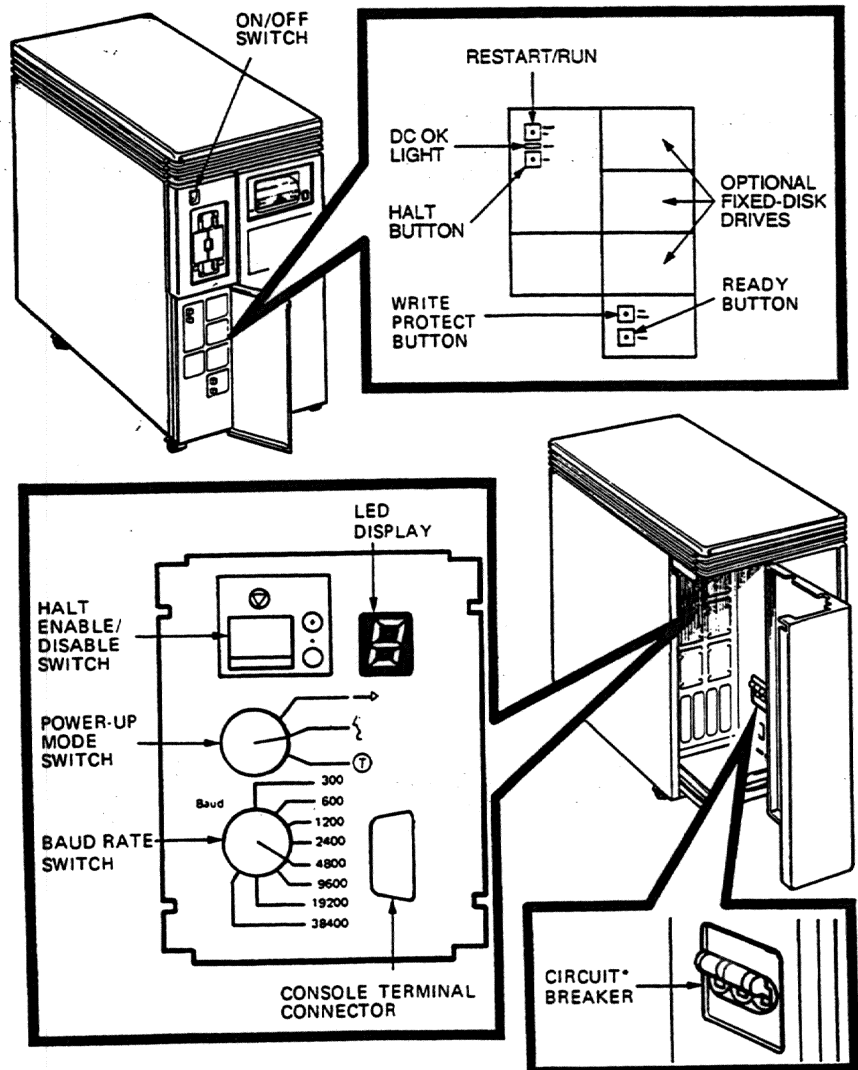
The diagrams in this appendix are to aid in locating the controls on your system that may be referenced during troubleshooting procedures.







**Figure A-2: MicroVAX II 630QB Controls and Indicators**

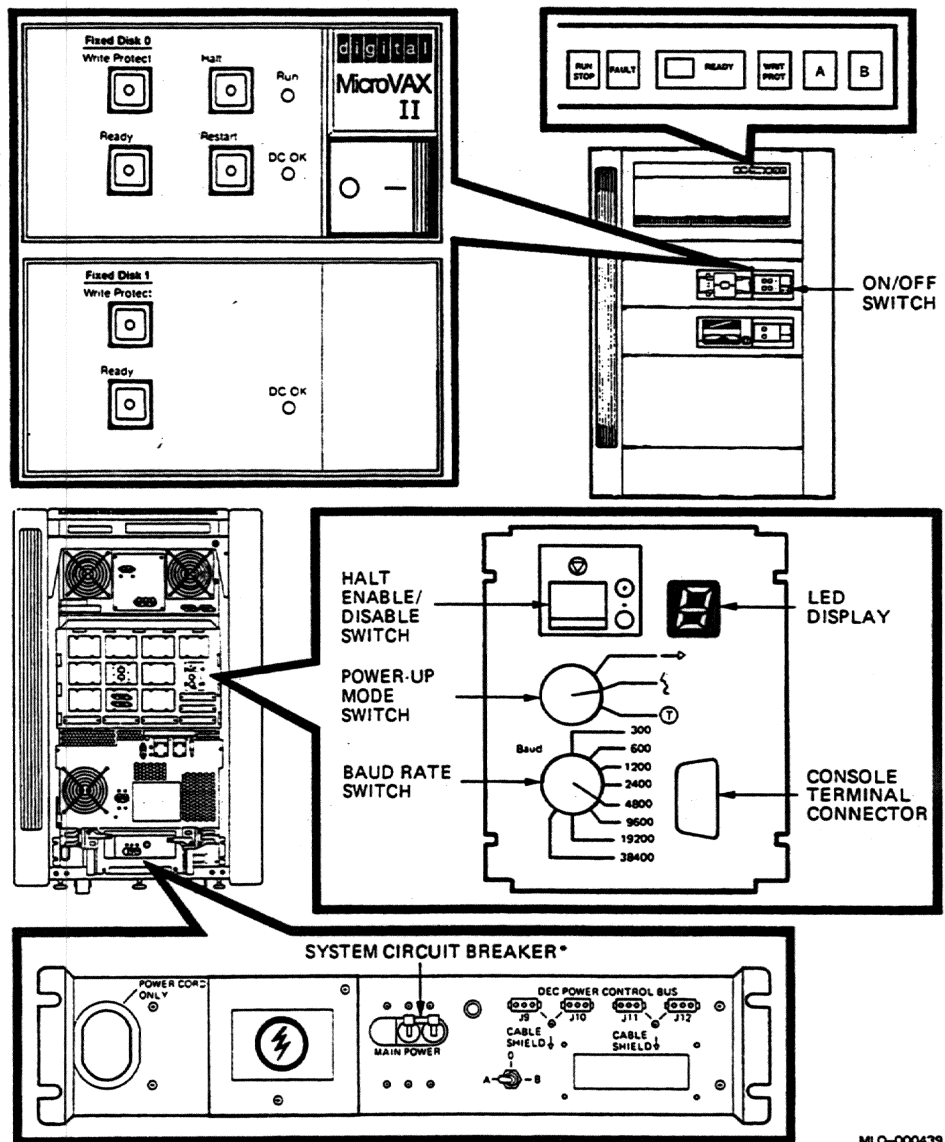


\*Reset the circuit breaker by pushing it down and then lifting it to the up position.

MLO-000438



**Figure A-3: MicroVAX II 630QE Controls and Indicators**

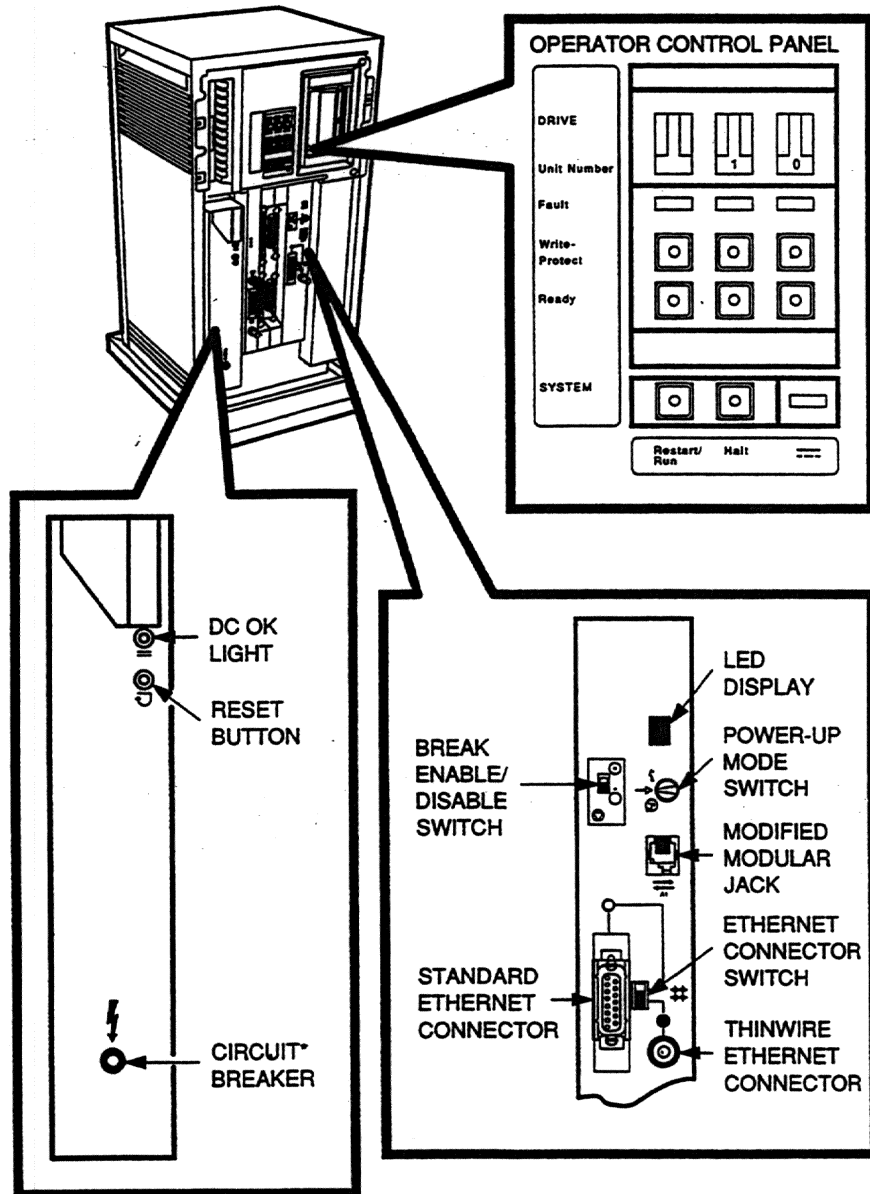


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\*Reset the circuit breaker by pushing it down and then lifting it to the up position.

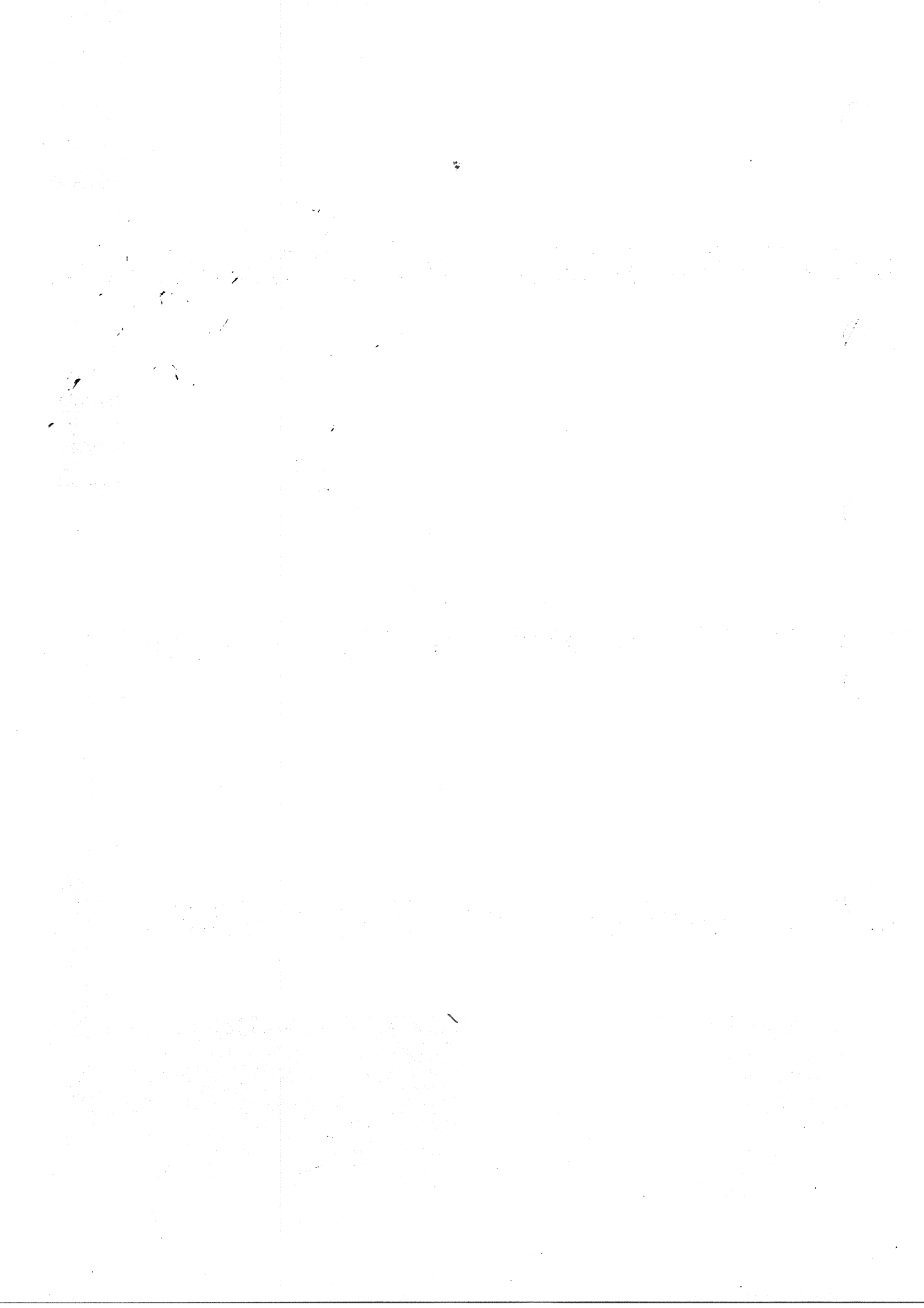


**Figure A-4: MicroVAX 3300  
Controls and Indicators**

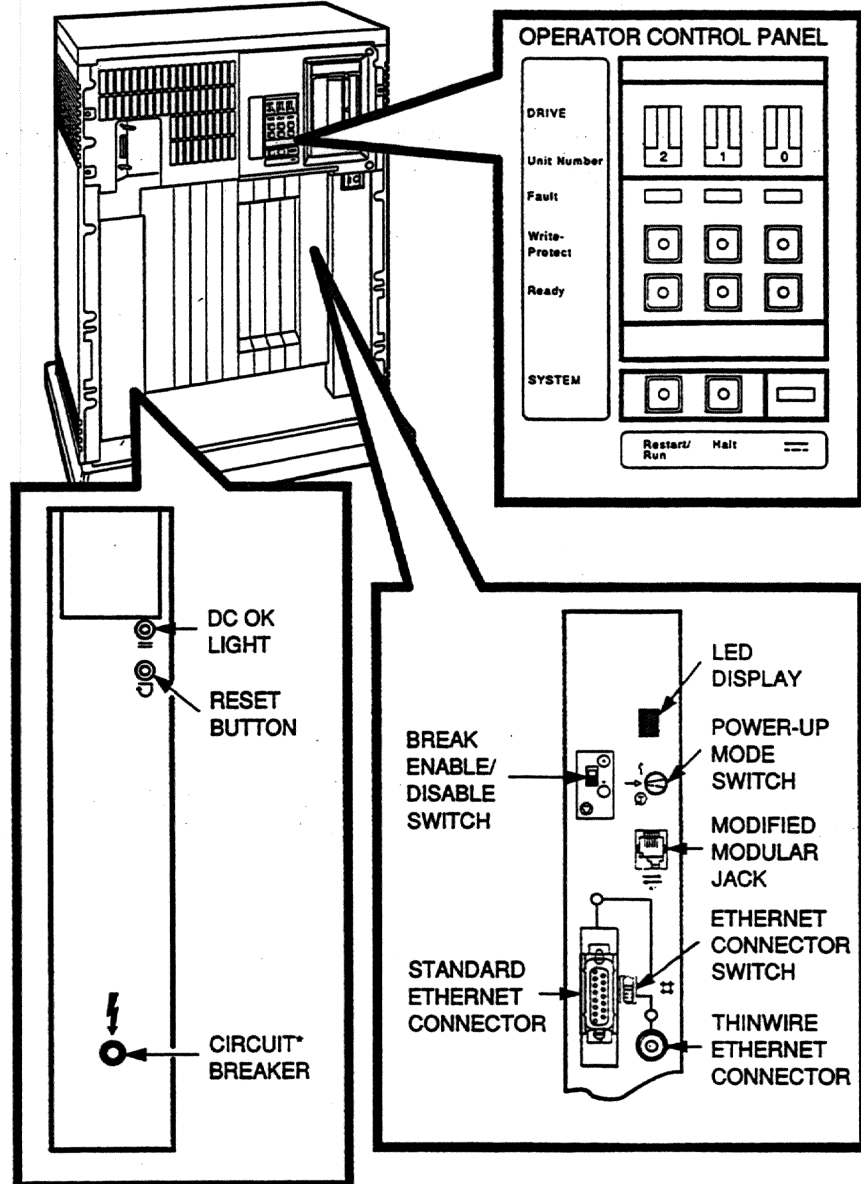


\*Reset the circuit breaker by pushing it in.

MLO-000723

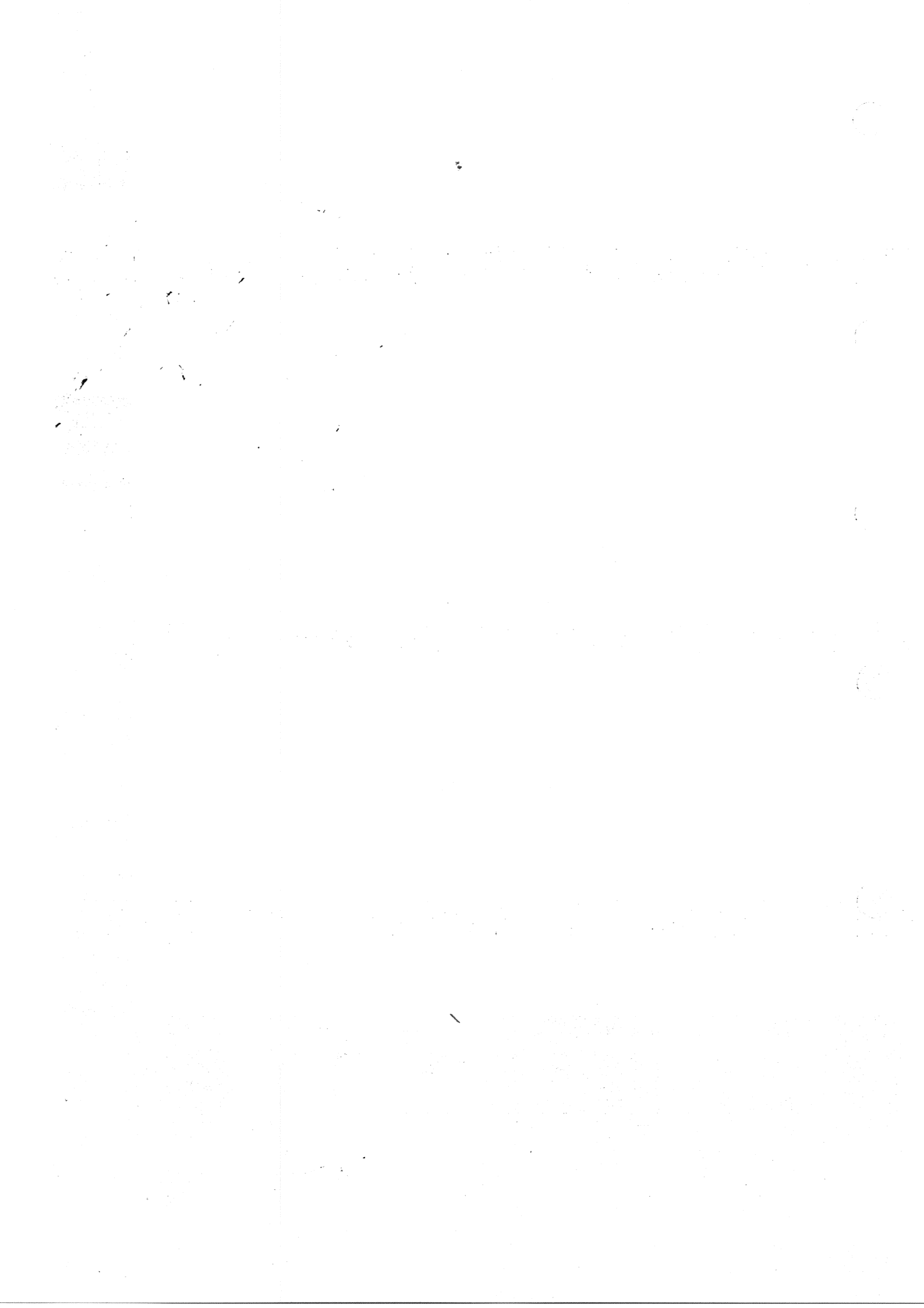


**Figure A-5: MicroVAX 3400  
Controls and Indicators**

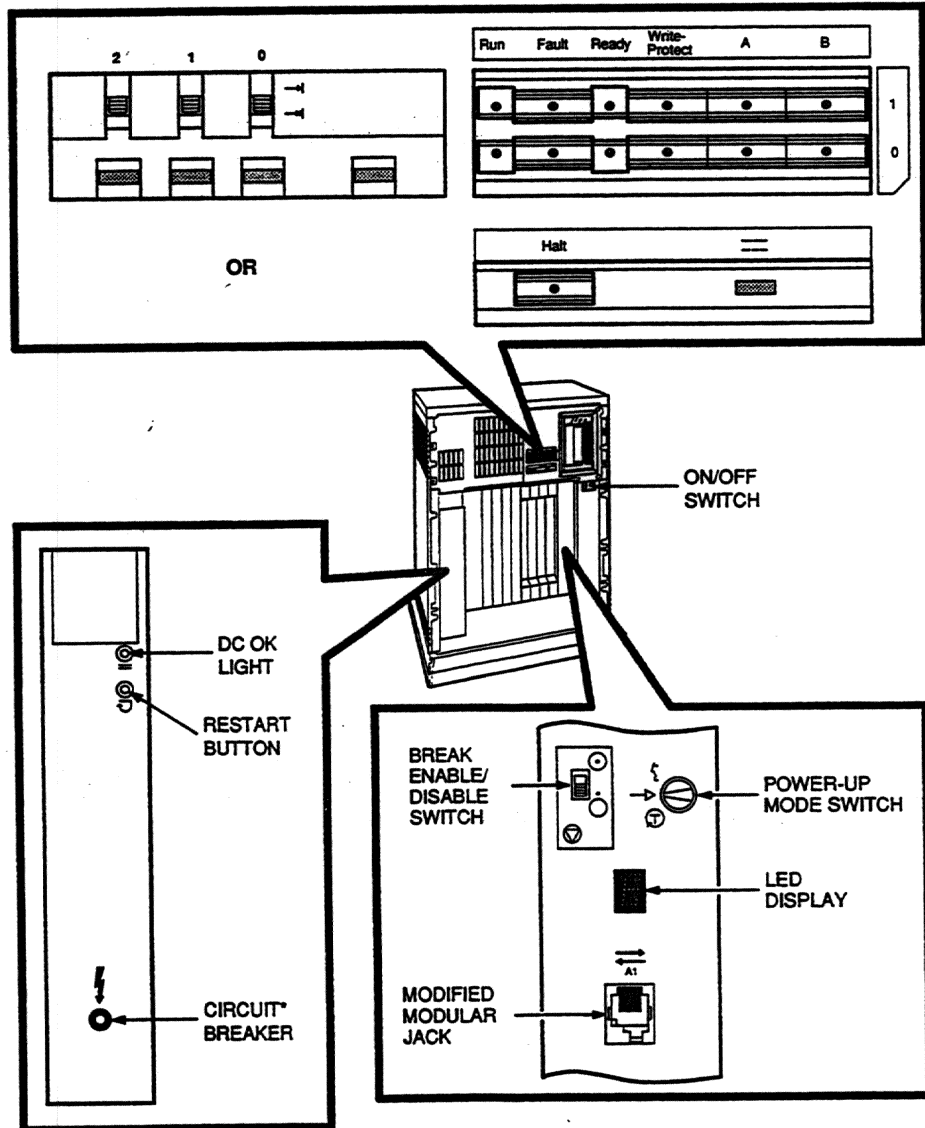


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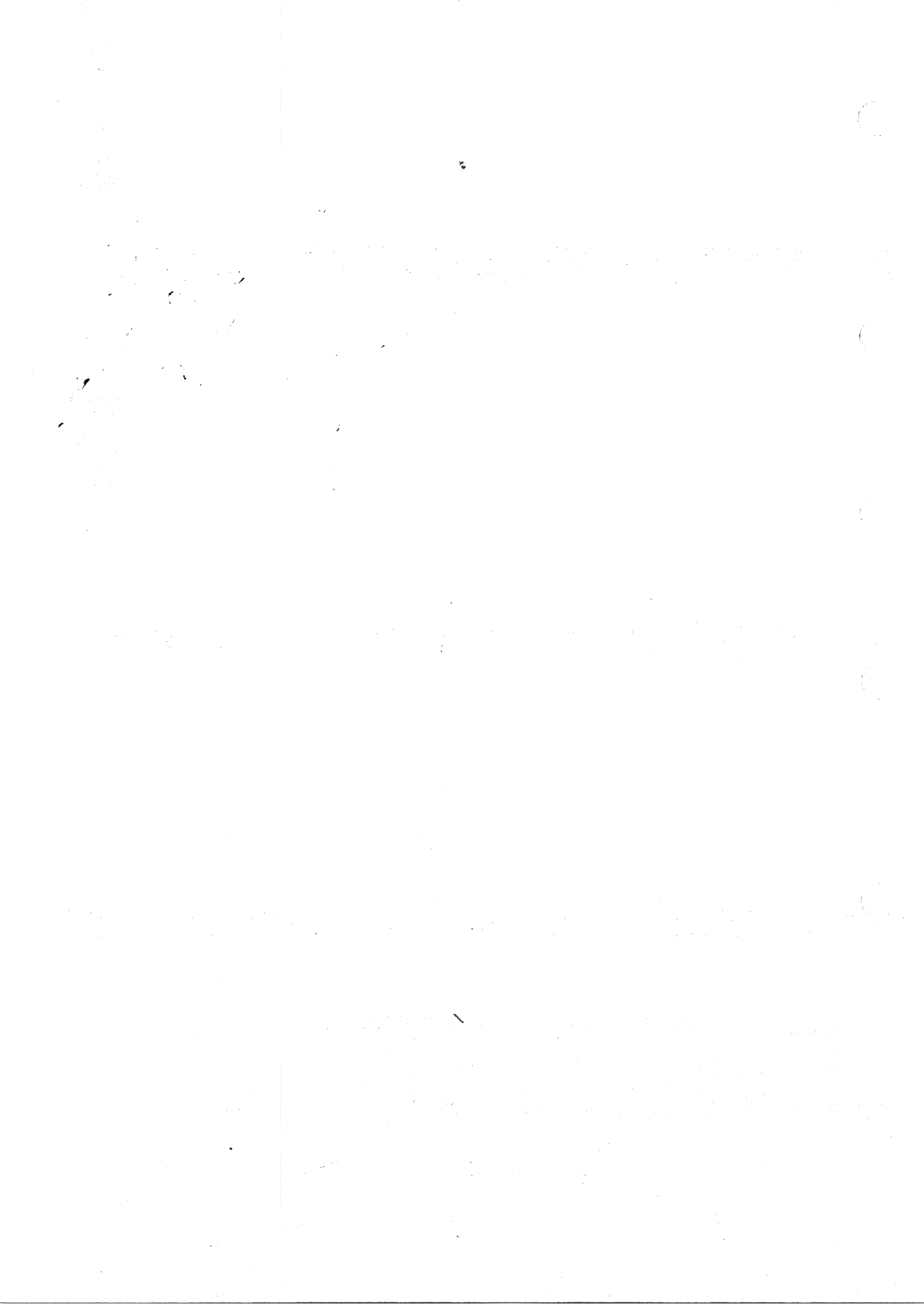


**Figure A-6: SDI-Based MicroVAX 3500 Controls and Indicators**

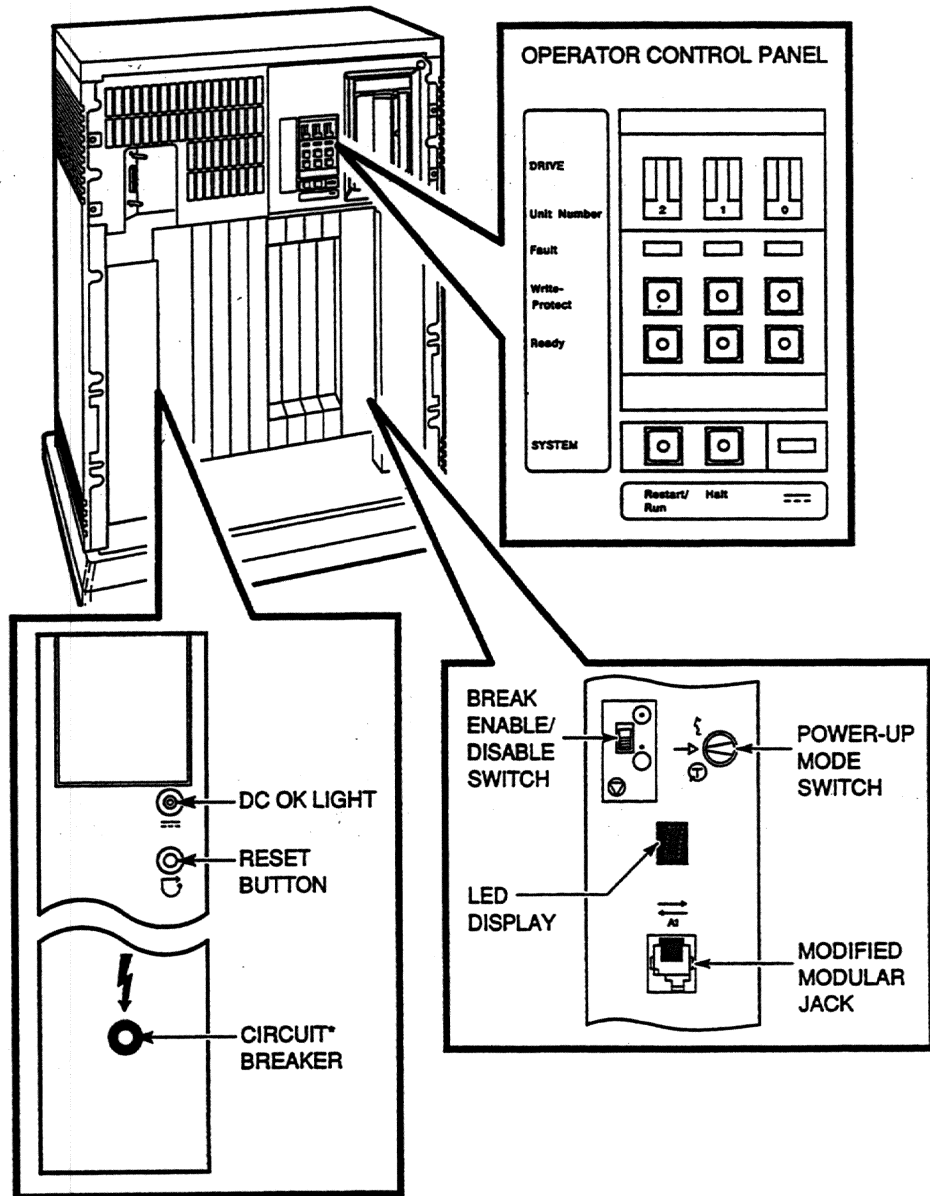


\*Reset the circuit breaker by pushing it in.

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**Figure A-7: DSSI-Based MicroVAX 3500 Controls and Indicators**

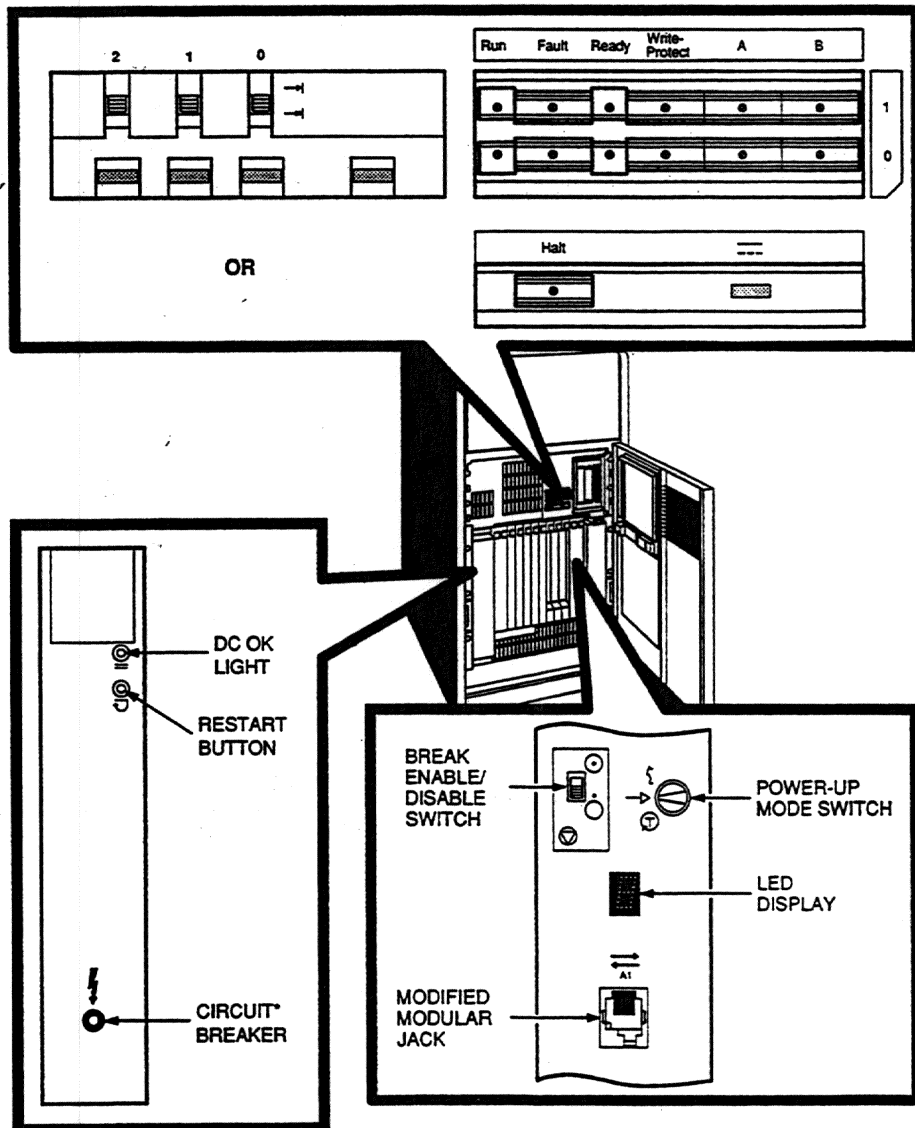


\*Reset circuit breaker by pushing it in.

MLO-002396

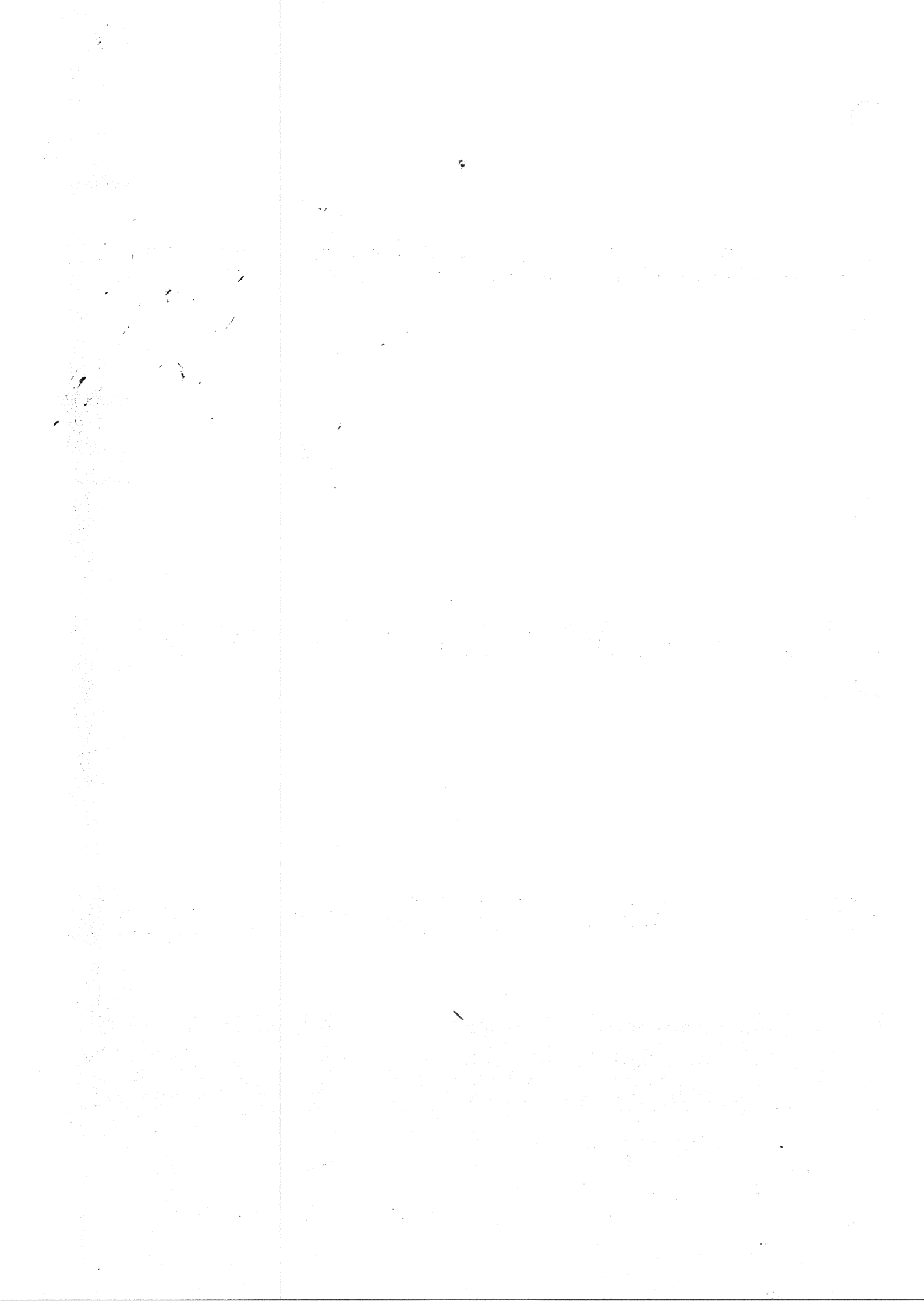


**Figure A-8: MicroVAX 3600 Controls and Indicators, Front View**

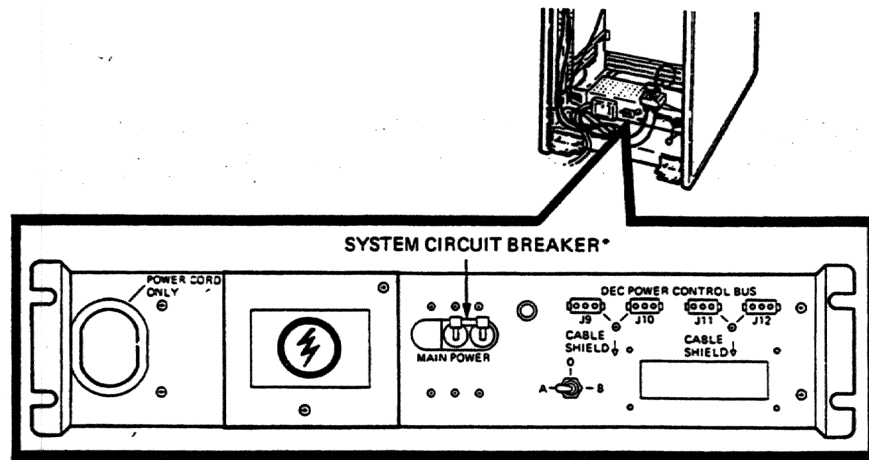


\*Reset the circuit breaker by pushing it in.

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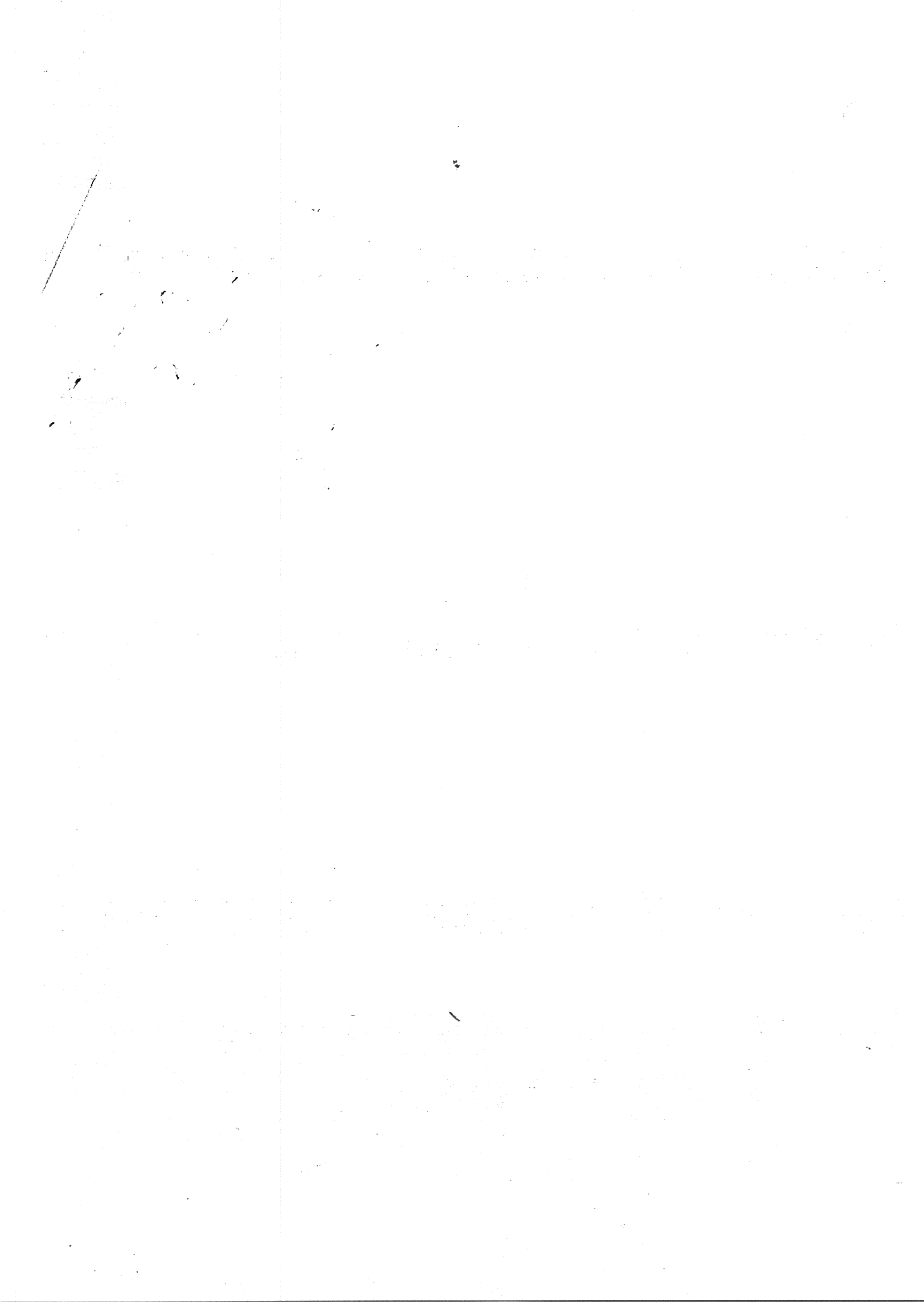


**Figure A-9: MicroVAX 3600 Controls and Indicators, Rear View**

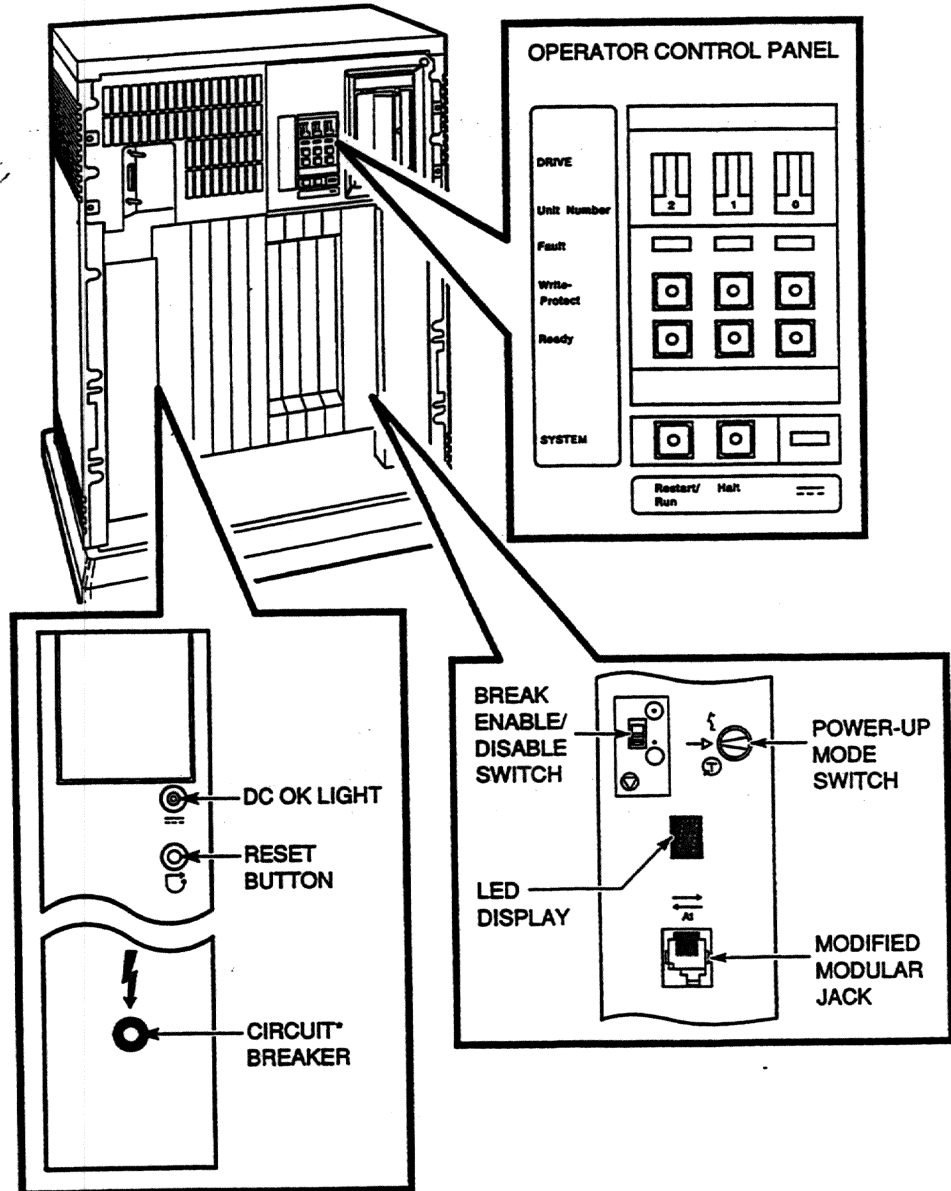


\*Reset the circuit breaker by pushing it down and then lifting it to the up position.

MLO-000442

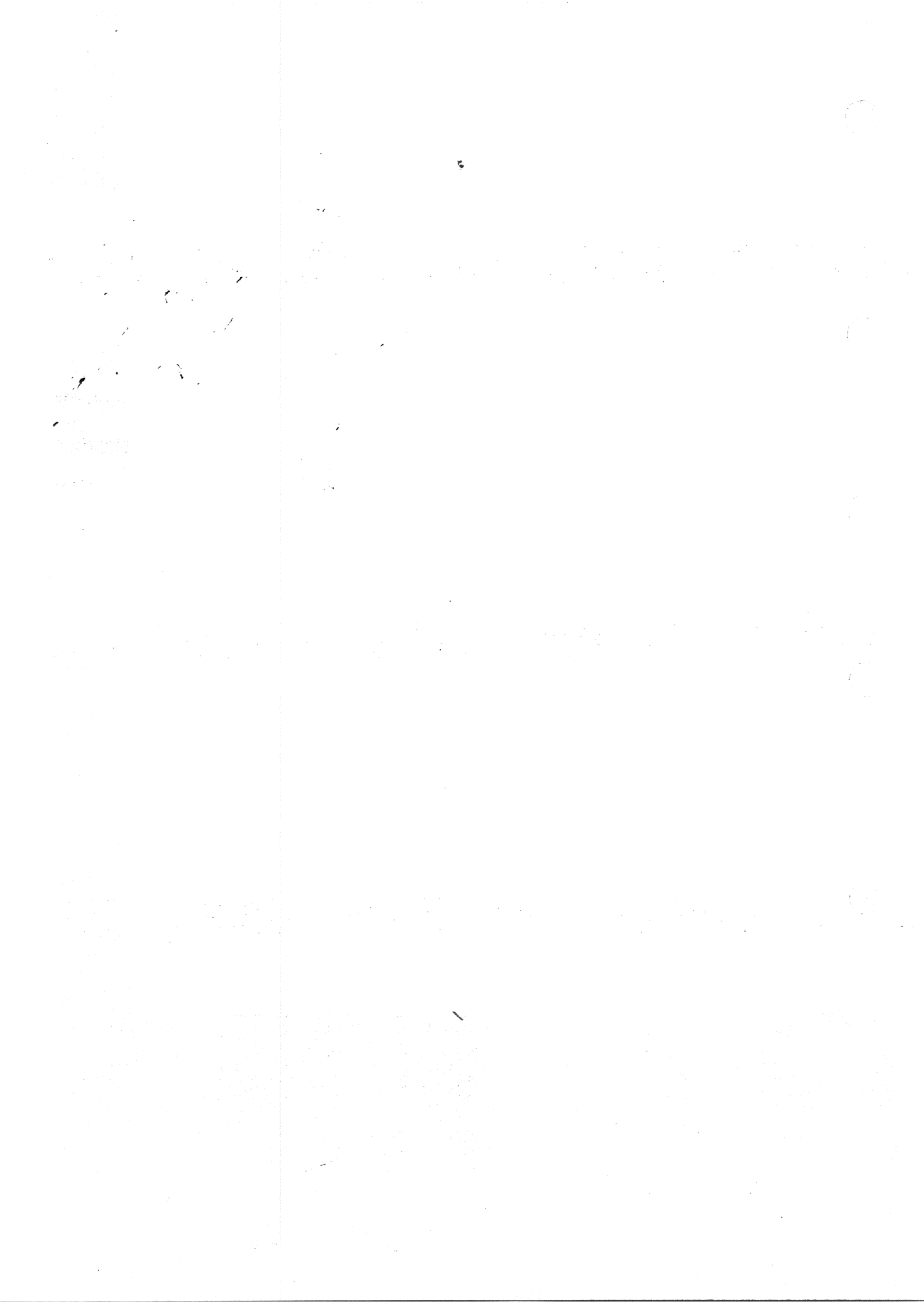


**Figure A-10: MicroVAX 3800  
Controls and Indicators**

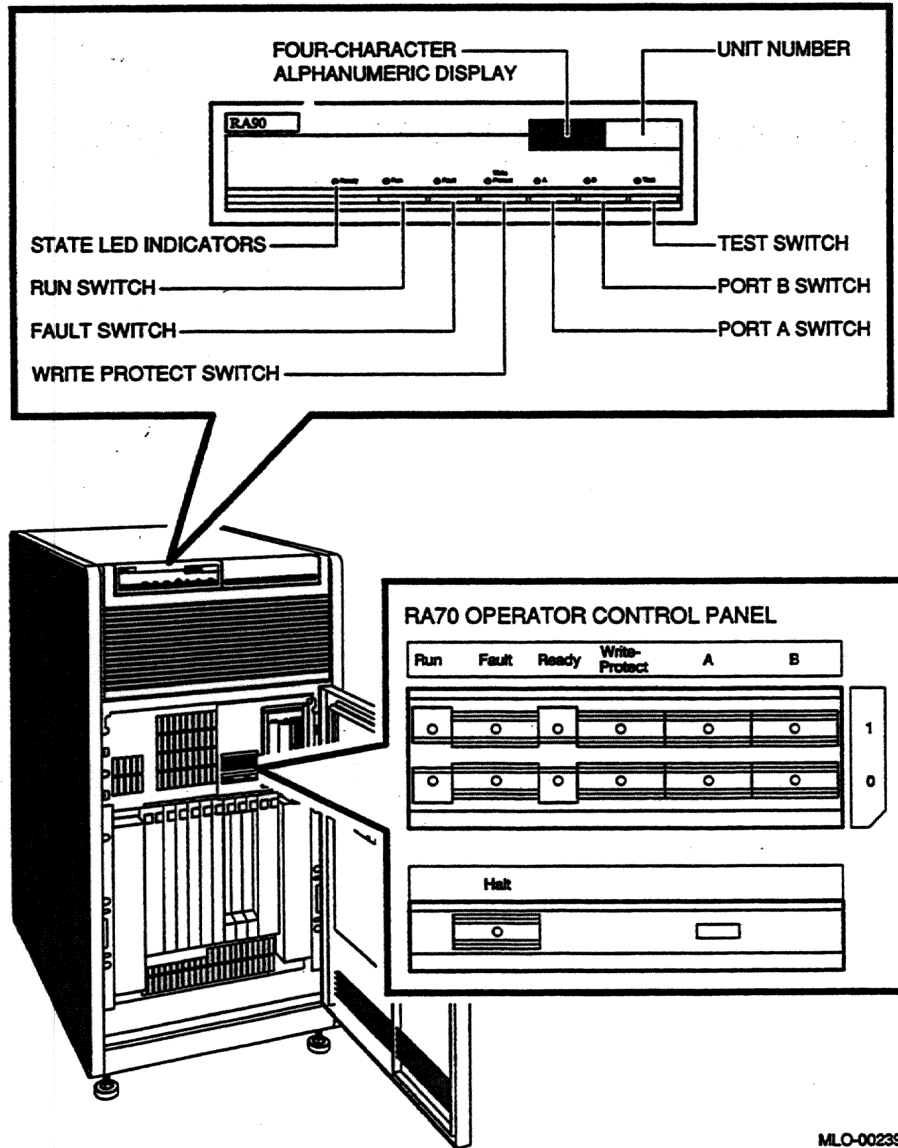


\*Reset circuit breaker by pushing it in.

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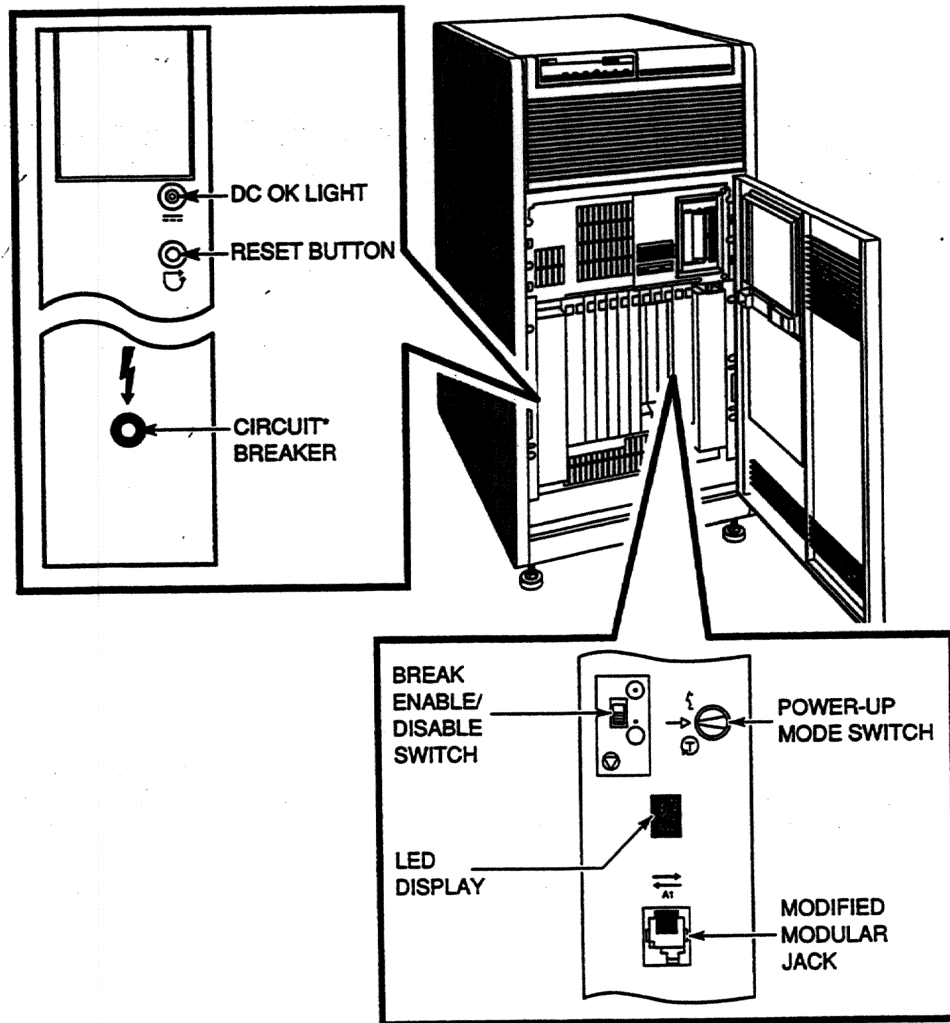
**Figure A-11: MicroVAX 3900 Controls and Indicators, Top Front View**



MLO-002397



**Figure A-12: MicroVAX 3900 Controls and Indicators, Bottom Front View**

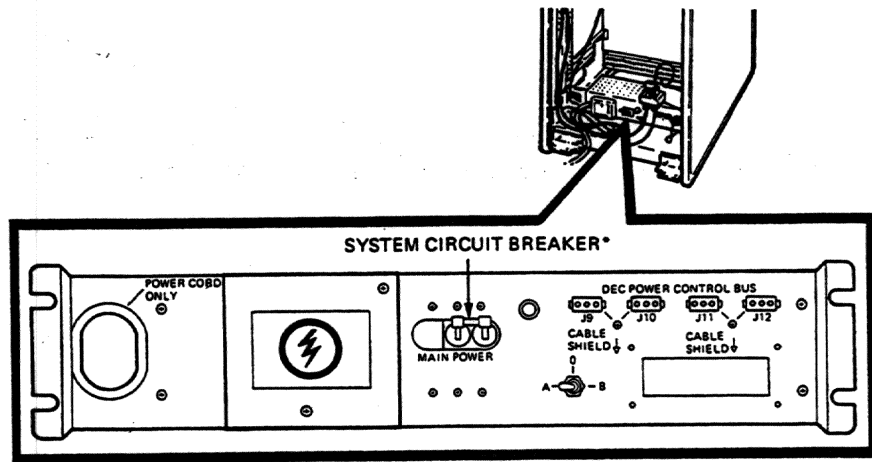


\*Reset circuit breaker by pushing it in.

MLO-002398

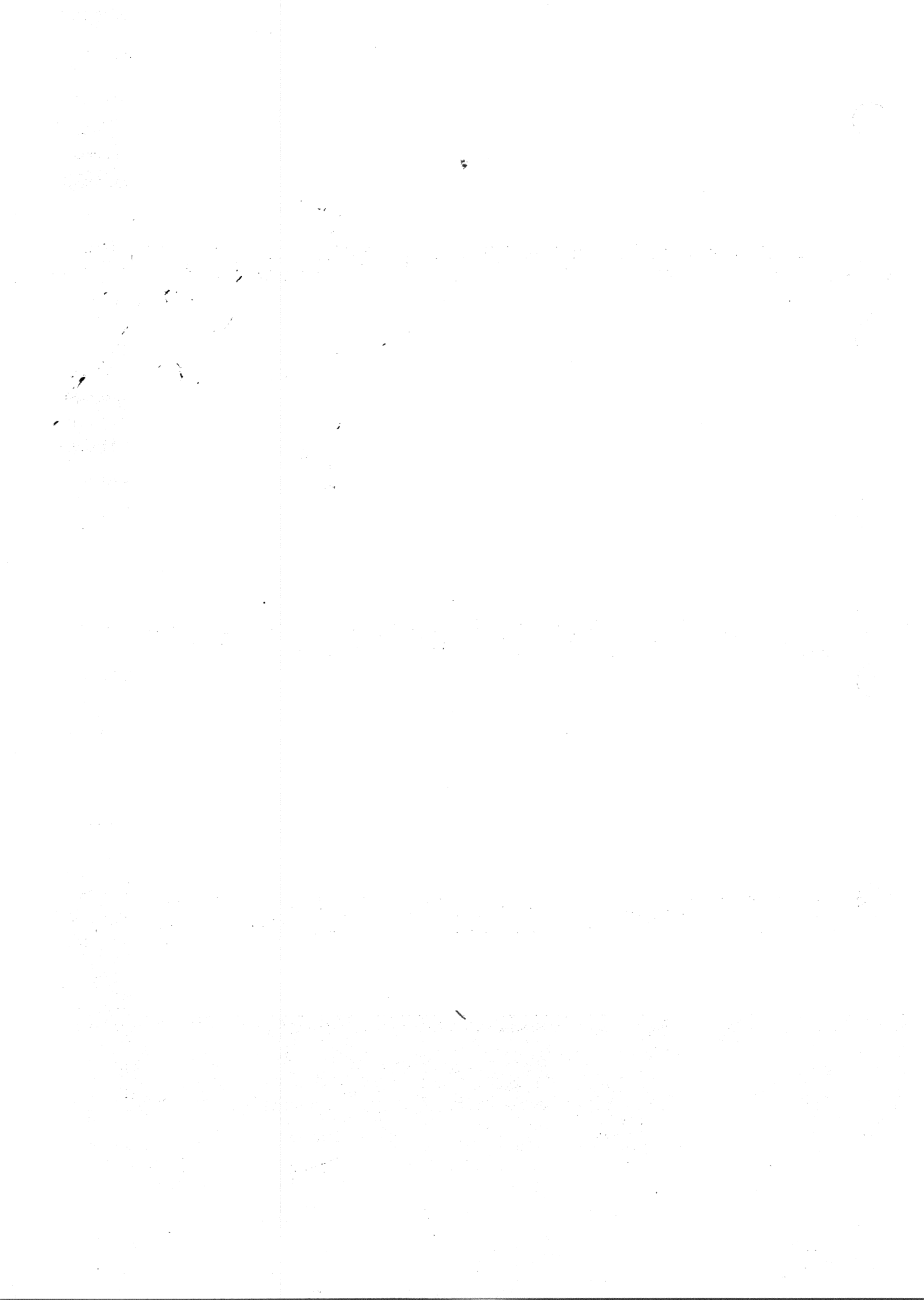


**Figure A-13: MicroVAX 3900 Controls and Indicators, Rear View**



\*Reset the circuit breaker by pushing it down and then lifting it to the up position.

ML0-000442



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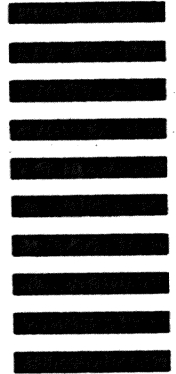
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