MicroVAX 3100
Model 85/95

Troubleshooting and Diagnostic Information

This manual describes the troubleshooting procedures and diagnostic commands that you can use to solve basic problems with the MicroVAX 3100 Model 85 and Model 95 systems.

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Preface

This manual describes the troubleshooting procedures and diagnostic commands
that you can use to solve basic problems with the MicroVAX™ 3100 Model 85 and
Model 95 systems.

Audience

This manual is intended for people who have some experience with computers.

Structure of This Manual

This manual presents the information you need for solving basic problems with
the MicroVAX 3100 Model 85/95 system in one chapter. Use the sections in
the order presented, starting with Section 1.1, Troubleshooting, when solving
a problem with your system. You can follow up with diagnostic testing or by
contacting Digital services for support as described in Section 1.3 and Section 1.4.

Additional Information

See the *MicroVAX 3100 Model 85/95 Operator Information* manual for the list of
related documents.

Conventions

The following conventions are used in this manual:

Convention	Description
MONOSPACE type	Text displayed on the screen is shown in monospace type.
italic type	Italic type emphasizes important information and indicates the complete titles of manuals.
Note	A note contains information that is of special importance to the user.
Warning	A warning contains information to prevent personal injury.

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Troubleshooting and Diagnosing Problems

This chapter describes the troubleshooting procedures and diagnostic commands that you can use to solve basic problems with the MicroVAX 3100 Model 85 and Model 95 systems. It contains information on the following:

- Troubleshooting

- Diagnostic tests and commands

- Contacting Digital™ services

It also lists the information that you must give to your Digital services representative and where to find this information.

1.1 Troubleshooting

If a problem occurs, you must first make sure that all the cables, loopback connectors, and terminators are correctly connected and that the connectors are not damaged, for example, the pins may be broken or short-circuited.

Follow these steps:

1. Shut down the operating system by following the procedures described in the operating system documentation.

2. Turn off the console terminal and all the peripheral devices, such as printers and modems.

3. Turn off all the expansion boxes.

4. Turn off the system unit.

5. Check that the following cables, if installed, are correctly connected at both ends and that the connectors are not damaged:

   - Console terminal cable (linking the console terminal to the system unit)

   - Console terminal power cord

- System unit power cord

- Expansion box SCSI cables

- Expansion box power cords

- ThinWire™ Ethernet cable or standard Ethernet cable

6. Check that the following terminators, if installed, are correctly connected and are not damaged:

   - SCSI terminators

   - ThinWire Ethernet terminator (T-connector and two terminators)

   - Standard Ethernet loopback connector

   If you have correctly followed steps 1 to 5, the on/off switches on all the components are set to the off (O) position, and you have solved any problems caused by incorrectly connected cables or terminators.

7. Set the on/off switches on the following equipment to the on (I) position in the following order:

   a. Expansion boxes

   b. Peripherals

   c. Console terminal

   d. System unit

The system responds with the power-up test display. If it does not, see Section 1.2.

1.2 Using the Troubleshooting Table

Table 1–1 suggests the corrective actions for certain system problems. If you have a problem with the system, follow these steps:

1. Write down the symptoms of the problem.

2. Check the Symptom column in Table 1–1 for a match.

3. Check the causes of the symptom in the Possible Cause column. If the column lists more than one possible cause, check the possible causes and their suggested solutions in the order listed.

4. Follow the advice in the Suggested Solution column.

5. See Section 1.4 if the problem persists.

Table 1–1 Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
System Problems		
The system unit fan is off or the power light is off.	The power cord is not connected. The power cord may be faulty. The power socket may not be working. The system breaker or wall outlet may have blown.	Make sure that all the power cords are connected correctly at both ends. Try a known good power cord or test the power socket with an appliance that works.
	The overload protection circuitry of the power supply may have shut down because of an abnormal condition on the power line.	Turn the system off and then turn it back on.
	The power supply unit (PSU) is faulty.	Contact your Digital services representative.
The power-up display does not show after 20 seconds.	The terminal cable is not correctly connected.	Make sure that all the cables are connected at both ends.
	The terminal cable is not connected to the correct MMJ port.	Check the MMJ port to which the terminal cable is connected. If this port is not MMJ port 3, remove the terminal cable and connect it to MMJ port 3.
	The power cord is not connected. The power cord may be faulty. The wall outlet may not be working.	Make sure that all the power cords are connected correctly at both ends. Try a known good power cord or test the power socket with an appliance that works.
	The terminal fuse may have blown.	Replace the blown terminal fuse. See the terminal documentation.
	The terminal settings may be incorrect.	See the *MicroVAX 3100 Model 85/95 Operator Information* manual for the list of correct terminal settings. See the terminal documentation for information on how to set up the terminal.

Table 1-1 (Cont.) Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
System Problems		
	The port to which the terminal connects may be faulty.	Try connecting the terminal to another system. If this solution works, the port to which the terminal was connected is faulty. If the terminal still does not operate, it is faulty. In either case, contact your Digital services representative.
	The terminal cable may be faulty.	Connect the terminal cable and the terminal to another system. If the connected terminal works, the DZ circuitry or MMJ connector is faulty. Otherwise, the cable is faulty. Contact your Digital services representative.
The power-up display contains question marks.	A diagnostic error has occurred.	See Section 1.4.
The power-up test display contains unexpected characters.	The terminal settings are incorrect or the DZ circuitry is faulty.	Make sure the terminal settings are correct, then run the power-up test again. If the terminal is set correctly, contact your Digital services representative.
The system fails to boot the operating system.	The system defaults are incorrectly set.	Set the system defaults as described in the *OpenVMS Factory Installed Software User Information* document, then try to boot the system again. If the system still fails to boot, contact your Digital services representative.

Table 1–1 (Cont.) Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
RRD43 Compact Disc Drive Problems		
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 (I) 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.

Table 1–1 (Cont.) Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
TZ30 Tape Drive Problems		
The TZ30 green LED flashes rapidly.	The drive mechanism is faulty or the tape cartridge is damaged.	Press and release the unload button to clear the fault. If the LED continues to flash, do not try to remove the tape cartridge or use the tape drive. Contact your Digital services representative.
The TZ30 does not operate.	The drive does not contain a tape cartridge.	Insert the tape cartridge and slide the lever from the UNLOCK to the LOCK position.
The operate lever does not slide.	The tape cartridge is in use.	Wait for the green LED to turn on and try again. If the problem persists, do not use the drive. Contact your Digital services representative.
The operate lever does not lock.	The tape cartridge is not inserted correctly.	Reinsert the tape cartridge. If the problem persists, contact your Digital services representative.
The tape does not load.		Press and release the unload button. Wait for the green LED to turn on before sliding the lever and removing the tape. If the LED flashes, contact your Digital services representative.
The system cannot write to the tape.	The write-protect switch is in the write-protect position.	If the write-protect LED is on, remove the tape, reset the switch and try writing to the tape again. If the problem persists, contact your Digital services representative.
The data read from the tape cartridge is corrupted.	The tape drive head may be dirty.	See the *MicroVAX 3100 Model 85 /95 Operator Information* manual for information on how to clean the drive head.
The tape does not eject.	The tape is not rewound. The operate lever is in the lock position.	Follow the procedure for removing a tape from the TZ30 described in the *MicroVAX 3100 Model 85/95 Operator Information* manual.

Table 1–1 (Cont.) Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
TLZ06 and TLZ07 Cassette Tape Drive Problems		
The system cannot write to the cassette tape.	The write-protect switch is in the write-protect position.	If the write-protect LED is on, remove the tape, reset the switch and try writing to the tape again. If the problem persists, contact your Digital services representative.
	The cassette tape is not loaded.	Load the cassette tape.
The write-protect LED flashes.	The tape drive heads are dirty or the tape is worn.	Clean the drive heads (see the *MicroVAX 3100 Model 85/95 Operator Information* manual). If the problem persists, use a new tape.
The data read from the cassette tape is corrupted.	The tape drive heads may be dirty.	See the *MicroVAX 3100 Model 85/95 Operator Information* manual for information on how to clean the drive heads.
TZK10/TZK11 Quarter Inch Cartridge (QIC) Tape Drive Problems		
The data read from the QIC tape is corrupted.	The drive head is dirty.	Clean the drive head. See the *MicroVAX 3100 Model 85/95 Operator Information* manual.
The system cannot write to the QIC tape.	The write-protect switch is in the write-protect position.	Remove the QIC tape, reset the switch and try to write to the QIC tape again. If the problem persists, contact your Digital services representative.
The system cannot read from or write to the QIC tape.	The QIC tape may be faulty.	Remove the QIC tape. If the amber LED turns off when you remove the QIC tape, the tape is probably faulty. Try a different QIC tape. If the amber LED stays on or if the problem persists, contact your Digital services representative.

Table 1–1 (Cont.) Basic Troubleshooting

Symptom	Possible Cause	Suggested Solution
RX™26 Diskette Drive Problems		
The system cannot read from or write to the diskette.	The diskette is not formatted.	Format the diskette.
	The diskette is not correctly inserted.	Eject the diskette. Try to insert the diskette again.
	The diskette is faulty.	Try a different diskette.
	The diskette drive is faulty.	Contact your Digital services representative.
	The diskette density is incorrect.	The RX26 accepts only high-density (HD) or extra-density (ED) diskettes.
	The diskette drive head may be dirty.	See the *MicroVAX 3100 Model 85 /95 Operator Information* manual for information on how to clean the diskette drive head.
The system can read from but cannot write to a diskette.	The write-protect switch is in the write-protect position.	Eject the diskette and reset the switch. Try writing to the diskette again.
The diskette does not eject.	The diskette is incorrectly positioned in the drive.	Gently press the diskette with your finger and reposition it. Press the eject button again.
RZ-Series SCSI Disk Drive Problems		
An installed drive does not work.	Two SCSI identifiers are set to the same number.	Reset each SCSI ID to a unique number.
	Drive cables are not properly connected.	Check the cable connections.
The Configuration display does not show a SCSI device.	SCSI device is not properly terminated.	Check for a SCSI 50-pin terminator.
	Two SCSI identifiers are set to the same number.	Reset each SCSI ID to a unique number.

1.3 Diagnostic Tests and Commands

There are a number of diagnostic tests and commands that can help you to isolate a problem with the system unit. These tests and commands are as follows:

- Power-up tests
- Diagnostic tests and utilities[1]
- Configuration display[1]
- Error display[1]

The following sections describe these tests and commands.

---

[1] You can use these tests and commands in privileged console mode only if the console security feature is enabled and the password is set. See the *MicroVAX 3100 Model 85/95 Customer Technical Information* manual for information on the console security feature.

1.3.1 Power-Up Tests

The system runs the power-up tests each time you turn on the system. After successful completion of tests, the system will either enter console mode or proceed to automatic bootstrap, depending on the HALT action selected by the user. If HALT action is Default, Halt, or Restart, then the system enters console mode. If HALT action is Reboot or Restart_reboot, then the system proceeds to boot. The following example shows a typical display for a system that passes all tests and then enters console mode.

```
KA55-A or KA51-A V2.3, VMB 2.14  ❶
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..  ❷
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..
Tests completed.  ❸
>>>  ❹
```

❶ Central Processing Unit (CPU) Name, Firmware Version Number, and Virtual Memory Boot (VMB) Version Number

❷ Read-Only Memory (ROM) Based Diagnostics Countdown

❸ Status Message

❹ Console Prompt

The following example shows a typical display for a system that passes all tests and then enters automatic bootstrap.

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..
Tests completed.
Loading system software.
(BOOT/R5:0 EZA0)
  2..
-EZA0
1..0..
```

_____ **Note** _____

The operating system messages start here, that is VMS . . .

_____

If the power-up tests encounter an error, one of the following actions occurs:

For minor errors:

- If HALT action is set to a boot condition (that is reboot or restart_reboot), and if a minor error occurs, the system displays an abbreviated error message and continues to boot as normal.

- If HALT action is set to Default, Halt or Restart, then the system enters console mode.

- The only errors defined as minor are errors in memory that cause pages to be marked bad in the memory bitmap. There must be enough good memory left to allow an attempt to bootstrap.

For severe errors:

- The system always enters console mode regardless of HALT action after it attempts to complete all tests possible.

The following example shows a system with a memory error that only affected one set of memory out of two sets. Because some memory is still usable, the system proceeds to automatic bootstrap if the HALT action is set to a boot condition.

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..

? Test_Subtest_40_06  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis

31..30..29..28..27..26..25..24..23..22..21..20..19..18..17..16..
15..14..13..12..11..10..09..08..07..06..05..04..03..

16 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 04000000 to 04FFFFFF, 16MB, 0 good pages, 32768 bad pages

64 MB RAM, SIMM Set (1E,1F,1G,1H) present
Memory Set 1: 00000000 to 03FFFFFF, 64MB, 131072 good pages, 0 bad pages

Total of 80MB, 131072 good pages, 32768 bad pages, 136 reserved pages

Tests completed.
Loading system software.
(BOOT/R5:0 EZA0)
  2..
-EZA0
1..0..
❶
? Test_Subtest_40_06  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis ❷

16 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 04000000 to 04FFFFFF, 16MB, 0 good pages, 32768 bad pages

64 MB RAM, SIMM Set (1E,1F,1G,1H) present
Memory Set 1: 00000000 to 03FFFFFF, 64MB, 131072 good pages, 0 bad pages

Total of 80MB, 131072 good pages, 32768 bad pages, 136 reserved pages
```

❶ Operating system messages start here; that is VMS . . .

❷ Abbreviated error message for memory error

Memory errors normally cause the results of a SHOW MEMORY display to occur after the tests are completed and before continuing. SHOW MEMORY is the most useful command to determine which memory SIMMs are bad when memory errors occur.

1.3.2 Diagnostic Tests and Utilities

The diagnostic tests and utilities are similar to the power-up tests except that the power-up tests enable you to test all the devices in the system, whereas the diagnostic tests and utilities enable you to test single devices and the functions of single devices.

Figure 1–1 shows a list of diagnostic tests obtained by entering the following command:

>>> **T 9E**

Figure 1–1 Diagnostic Tests

```
Test
#    Address   Name               Parameters
─────────────────────────────────────────────────────────────────────────
     20052200  SCB
     20055850  De_executive
30   2006A53C  Memory_Init_Bitmap  *** mark_Hard_SBEs ******
31   2006AB34  Memory_Setup_CSRs   *********
32   2005D148  NMC_registers       **********
33   2005D324  NMC_powerup         **
34   2005E6D8  SSC_ROM             ***
35   2005FB90  B_Cache_diag_mode   bypass_test_mask *********
37   20061590  Cache_w_Memory      bypass_test_mask *********
40   2006B5E0  Memory_count_pages  SIMM_set0 SIMM_set1 Soft_errs_allowed *****
41   20068CEC  Board_Reset         *
42   20061880  Chk_for_Interrupts  **********
46   200610C4  P_Cache_diag_mode   bypass_test_mask *********
47   2006AD04  Memory_Refresh      start_a end_incr cont_on_err time_seconds *****
48   2006B028  Memory_Addr_shorts  start_add end_add * cont_on_err pat2 pat3 ****
4A   2006A23C  Memory_ECC_SBEs     start_add end_add add_incr cont_on_err ******
4B   2006940C  Memory_Byte_Errors  start_add end_add add_incr cont_on_err ******
4C   20069BA0  Memory_ECC_Logic    start_add end_add add_incr cont_on_err ******
4D   20068FE8  Memory_Address      start_add end_add add_incr cont_on_err ******
4E   20069188  Memory_Byte         start_add end_add add_incr cont_on_err ******
4F   2006B7F4  Memory_Data         start_add end_add add_incr cont_on_err ******
51   2005803C  FPA                 **********
52   20058530  SSC_Prog_timers     which_timer wait_time_us ***
53   20058818  SSC_TOY_Clock       repeat_test_250ms_ea Tolerance ***
54   20057C18  Virtual_Mode        ********
55   20058E6C  Interval_Timer      *****
56   2006507C  SHAC_LPBCK          From_bus To_bus passes ******
58   20065D24  SHAC_RESET          dssi_bus port_number time_secs not_pres *
59   20062778  SGEC_LPBCK_ASSIST   time_secs **
```

(continued on next page)

Figure 1–1 (Cont.) Diagnostic Tests

```
5C   20062D10   SHAC                  SHAC_number *********
5F   200619B8   SGEC                  loopback_type no_ram_tests ******
62   20058B1C   console_QDSS          mark_not_present selftest_r0 selftest_r1 *****
63   20058CA4   QDSS_any              input_csr selftest_r0 selftest_r1 ******
80   2005D3C0   CQBIC_memory          bypass_test_mask *********
81   200596CC   Qbus_MSCP             IP_csr ******
82   200598AC   Qbus_DELQA            device_num_addr ****
83   2005A85C   QZA_Intlpbck1         controller_number ********
84   2005BF1C   QZA_Intlpbck2         controller_number *********
85   20059A9C   QZA_memory            incr test_pattern controller_number *******
86   20059F44   QZA_DMA               Controller_number main_mem_buf ********
90   20058494   CQBIC_registers       *
91   20058410   CQBIC_powerup         **
99   2005DC4C   Flush_Ena_Caches      dis_flush_VIC dis_flush_BC dis_flush_PC
9A   20063FB0   INTERACTION           pass_count disable_device *******
9B   20068E48   Init_memory           **
9C   2006631C   List_CPU_registers *
9D   2006C250   Utility               Flags *********
9E   2005903C   List_diagnostics      script_number *
9F   200681CC   Create_A0_Script      **********
C1   20057888   SSC_RAM_Data          *
C2   20057A78   SSC_RAM_Data_Addr     *
C5   200589E8   SSC_registers         *
D0   20060C70   V_Cache_diag_mode     bypass_test_mask *********
D2   2005DE90   O_Bit_diag_mode       bypass_test_mask *********
DA   2006139C   PB_Flush_Cache        **********
DB   2005E850   Speed                 print_speed *********
DC   2006C060   NO_Memory_present     *
DD   2005F0DC   B_Cache_Data_debug start_add end_add add_incr *******
DE   2005EC64   B_Cache_Tag_Debug start_add end_add add_incr *******
DF   2005E2A8   O_BIT_DEBUG           start_add end_add add_incr seg_incr ******
E0   2006D4D4   SCSI                  environment reset_bus time_s *******
E1   2006D7CC   SCSI_Utility          environment util_nbr target_ID lun ******
E2   2006DA2C   SCSI_MAP              bypass_test addr_incr data_tst ********
E4   2006DFC8   DZ                    environment *********
E8   2006E1DC   SYNC                  environment *********
E9   2006E2B4   SYNC_Utility          environment *********
EC   2006E398   ASYNC                 environment *********
F0   2006D638   SCSI_option           environment reset_bus time_s *******
F1   2006D900   SCSI_Opt_Utility      environment util_nbr target_ID lun ******
F2   2006DA40   SCSI_MAP_Option       bypass_test addr_incr data_tst ********
```

Scripts
Description

Figure 1–1 (Cont.) Diagnostic Tests

```
A0  User defined scripts
A1  Powerup tests, Functional Verify, continue on error, numeric countdown
A3  Functional Verify, stop on error, test # announcements
A4  Loop on A3 Functional Verify
A6  Memory tests, mark only multiple bit errors
A7  Memory tests
A8  Memory acceptance tests, mark single and multi-bit errors, call A7
A9  Memory tests, stop on error
B2  Extended tests plus BF, then loop
B5  Extended tests, then loop
BF  DZ, SYNC, ASYNC with loopbacks

Load & start system exerciser
100 Customer mode, 2 passes
101 CSSE mode, 2 passes
102 CSSE mode, continous until ^C
103 Manuf mode, continous until ^C
104 Manuf TINA mode, continous until ^C
105 Manuf mode, 2 passes
106 CSSE mode, select tests, continous until ^C
107 Manuf mode, select tests, continous until ^C
```

―――――――――――――――――― **Note** ――――――――――――――――――

Tests 101 through 107 are reserved for use by Digital services.

―――

The tests and utilities shown in Table 1–2 are for option cards, which may or may not be present, depending upon the options you ordered.

Table 1–2 Option Card Tests

Test	Name	Usage
E8	SYNC	Synchronous COMM option card (DSW41/42)
E9	SYNC_Utility	Synchronous COMM option card (DSW41/42)
EC	ASYNC	Asynchronous option card (DHW41/42)
F0	SCSI_option	SCSI option card for 2nd SCSI bus B (KZDDA)
F1	SCSI_Opt_Utility	SCSI option card for 2nd SCSI bus B (KZDDA)
F2	SCSI_MAP_Option	SCSI option card for 2nd SCSI bus B (KZDDA)

_____ **Note** _____

The following available tests (Table 1–3) are not used on the MicroVAX
3100 Model 85/95; they are used only on the MicroVAX 4000 Model 100A
/105A, and are listed here to avoid confusion when you see them in the
diagnostic test listing (Figure 1–1).

_____

Table 1–3 MicroVAX 4000-100A/105A Tests

Test No.	Name	Usage
56	SHAC_LPBCK	Not used on 3100, SHAC option only
58	SHAC_RESET	Not used on 3100, SHAC option only
5C	SHAC	Not used on 3100, SHAC option only
62	console_QDSS	Not used on 3100, QBUS systems only
63	QDSS_any	Not used on 3100, QBUS systems only
81	Qbus_MSCP	Not used on 3100, QBUS systems only
82	Qbus_DELQA	Not used on 3100, QBUS systems only
83	QZA_Intlpbck1	Not used on 3100, QBUS systems only
84	QZA_Intlpbck2	Not used on 3100, QBUS systems only
85	QZA_memory	Not used on 3100, QBUS systems only
86	QZA_DMA	Not used on 3100, QBUS systems only

To run the diagnostic tests, enter either TEST or T followed by the test number.

You can specify optional parameters for some tests, but you would not do so
normally. If you decide to specify optional parameters, then the following
conditions apply:

* Each test uses up to 10 parameters, no more than 7 may be inputted on a
  command line.

  Most of these parameters are assigned values automatically by the system.
  These parameters are indicated by an asterisk (*) in the parameters column
  of Figure 1–1.

* If a parameter can be assigned a value, the name of the parameter is shown
  in the parameters column in Figure 1–1.

You can use test 9E with the test number as a parameter to show a list of legal parameters and valid values for the test number. For example, enter T 9E 30 to show a list of legal parameters and valid values for test number 30 (Memory_Init_Bitmap).

- There is a dependency between some tests.

- Failures can occur if dependencies between tests are not followed.

- Any parameter not entered is given a default value. Enter T 9E nn, where nn is test number to show defaults. During power-up testing or execution of any script of tests (A0 to BF), the values of parameters are determined by the script, not defaults.

- You may dump the contents of a script by entering T 9E nn, where nn is a script to dump. Scripts are always in range of A0 to BF (or 0 for the power-up script).

You must enter three zeros (0) as place holders for the three parameters that occur before the user-specified parameter, mark_hard_SBEs. The last value (1) is a parameter. You can then specify the mark_hard_SBEs parameter in the Memory_Init_Bitmap test as follows:

```
>>> T 30 0 0 0 1
```

The resulting messages differ, depending on the function of the test or utility. However, most failing tests cause the system to display error messages similar to the following:

```
>>> T 5F 1
? Test_Subtest_5F_18  Loop_Subtest=0E  Err_Type=FF   DE_SGEC.lis
Vec=010C   Prev_Errs=0000   P1=00000001   P2=00000000   P3=827DFF03   P4=00000000
P5=00000000  P6=00000000   P7=00000000   P8=00000001   P9=00000000 P10=00000000
r0=00000054   r1=000082E2   r2=00000001   r3=000082FA   r4=00008230   r5=00000040
r6=000082E2   r7=20008000   r8=00008000   r9=20140758   r10=13000001 r11=2014044B
 EPC=2005721A dser=0000 cesr=00000000 icsr=01 pcsts=F800 pcctl=FC13
 cctl=00000007 bcetsts=03A0 bcedsts=0400 cefsts=00019200 nests=00
 mmcdsr=00C6C600 mesr=00006000

>>>
```

Write down the error messages before you contact your Digital services representative.

1.3.3 Power-Up Error Messages

The following are examples of some error messages at power-up.

Example 1–1 is a typical example of a failed test. In this case, test E8 failed testing a SYNC (COMM) option.

Example 1–1 SYNC Test Failure

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..

? Test_Subtest_E8_03  Loop_Subtest=00  Err_Type=FF   DE_SYNC.lis
Vec=0000  Prev_Errs=0001   P1=09000001   P2=00000000   P3=00000000 P4=00000000
P5=00000000  P6=00000000   P7=00000000   P8=00000000   P9=00000000 P10=00000000
Stat=0112  FRU=20 LED=00  Ext_Stat 00090014 00EE001D 00020002 0000EFCE 00000000
 20040000 7FDEDFFF 00000000
 dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=F800 pcctl=FC13 cctl=00000021
 bcetsts=0000 bcedsts=0000 cefsts=00019220 nests=00 mmcdsr=01111000
 mesr=00006000

08..07..06..05..04..03..

Normal operation not possible.
>>>
```

Example 1–2 represents a case where an additional set of memory SIMMs was added and one of the four SIMMs for the set was not the same type of SIMM as the others. In this example SIMM 1H was either not installed or incorrectly installed.

Example 1–2 Memory_Setup_CSRs Test Failure

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..

? Test_Subtest_31_05  Loop_Subtest=00  Err_Type=FF    DE Memory_Setup_CSRs.lis
Vec=0000  Prev_Errs=0000   P1=00000000   P2=01000000   P3=00000001  P4=00010000
P5=2101801C  P6=00000007  P7=80000003  P8=0000CF4A  P9=00000001 P10=2006B8D8
r0=00000002  r1=21018000  r2=00000008  r3=81000000  r4=00000001  r5=01000000
r6=2006EB77  r7=21018048  r8=00000000  r9=20140758  r10=00000000 r11=FFFFFFFF
 dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=FA00 pcadr=FFFFFFF8 pcctl=FC13
 cctl=00000020 bcetsts=0360 bcedsts=0F00 cefsts=00019200 nests=00
 mmcdsr=01FE6600 mesr=00000000

58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..

16 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 00000000 to 00FFFFFF, 16MB, 32768 good pages, 0 bad pages

Error:  SIMM Set 1 (1E,1F,1G,1H)                        ❶
 SIMM_1E = 64MB      SIMM_1F = 64MB      SIMM_1G = 64MB      SIMM_1H = 00MB ??

Total of 16MB, 32768 good pages, 0 bad pages, 104 reserved pages

Normal operation not possible.
```

❶ Indicates no memory SIMM installed here or SIMM not correctly installed.

Example 1-3 represents a case where one SIMM of a set was bad. In this example, SIMM 1G was bad or incorrectly installed.

Example 1-3 Memory_Count_Pages Test Failure

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..

? Test_Subtest_40_06  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis

31..30..29..28..27..26..25..24..23..22..21..20..19..18..17..16..
15..14..13..12..11..10..09..08..07..06..05..04..03..

16 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 04000000 to 04FFFFFF, 16MB, 32768 good pages, 0 bad pages

Error:  SIMM Set 1 (1E,1F,1G,1H)
 SIMM_1E = 64MB      SIMM_1F = 64MB      SIMM_1G = 64MB ??   SIMM_1H = 64MB
Memory Set 1: 00000000 to 03FFFFFF, 64MB, 0 good pages, 131072 bad pages

Total of 80MB, 32768 good pages, 131072 bad pages, 136 reserved pages

Tests completed.
```

Example 1–4 represents a case where one SIMM of a set is missing or incorrectly installed. In this case, only one set of SIMMs was installed. Since one was missing, there is no usable memory for testing to run to completion. SIMM 1D is missing here.

Example 1–4 No_Memory_Present Test Failure

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..

? Test_Subtest_DC_87  Loop_Subtest=00  Err_Type=FF   DE_NO_Memory_present.lis
Vec=0000  Prev_Errs=0000   P1=EF42EF42   P2=00000000   P3=00000000  P4=00000000
P5=00000000  P6=7F337F7F   P7=00000000   P8=0000EF42   P9=00000001 P10=2006B8D8
r0=00000002  r1=21018000   r2=00000008   r3=00000007   r4=03FFFFE0  r5=80000000
r6=FFFFFFFF  r7=00000000   r8=00000000   r9=20140758  r10=FFFFFFFE r11=FFFFFFFF
 dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=FA00 pcadr=FFFFFFF8 pcctl=FC13
 cctl=00000020 bcetsts=0360 bcedsts=0F00 cefsts=00019200 nests=00
 mmcdsr=00666640 mesr=00000000


Error:  SIMM Set 0 (0A,0B,0C,0D)
 SIMM_0A = 16MB      SIMM_0B = 16MB      SIMM_0C = 16MB      SIMM_0D = 00MB ??

Total of 0MB, 0 good pages, 0 bad pages, 0 reserved pages

Normal operation not possible.
```

1.3.4 Configuration Display

The configuration display shows the system configuration and the error messages that were detected while the most recent power-up tests, diagnostic tests, and utilities were running. If you add expansion boxes to the system and do not run the power-up tests or appropriate diagnostic test or utility, the configuration display does not recognize the reconfiguration. Enter the following command to see the configuration display:

>>> **SHOW CONFIG**

If the system does not detect any errors in the most recent power-up tests or diagnostic utilities, it responds with a configuration display similar to the following:

```
KA55-A or KA51-A V2.3, VMB 2.14
08-00-2B-33-CF-C9
80MB
      ❶          ❷              ❸
TstNbr   DevNam         Info
------   --------       -------------------------
      0    CPU_BD       OK
     A8       MEM       OK
     E4        DZ       OK
     E0      SCSI       OK
                        3-RZ24L    6-Adapter    7-RRD43  ❹
     5F        NI       OK
     F0    SCSI_B       OK
                        0-RZ23L    6-Adapter
      0      QBUS       OK
     E8      COMM       OK
                        DSW41/42 2 CHANNEL V4.10-7b
     EC     ASYNC       OK
                        DHW41/2 V1.6
```

❶ Test Utility Number Column

❷ Device Mnemonic Column

❸ Device Status Column

❹ SCSI IDs and SCSI Device Names

The test numbers listed identify the normal test or script number to run to verify the device listed. There are additional tests and utilities for some devices. Test 0 calls the power-up script.

If the system detects errors in the most recent power-up tests and diagnostic utilities, it responds with a configuration display similar to the following:

```
KA55-A or KA51-A V2.3, VMB 2.14
08-00-2B-2B-16-91
80MB

TstNbr  DevNam      Info
------  --------    -------------------------
     0    CPU_BD    OK
    A8    MEMORY    OK
    E4        DZ    ?? 001 0048  ❶
    E0      SCSI    OK
                    3-RZ24L    6-Adapter 7-RRD43
    5F        NI    OK
    E8      COMM    OK
                    DSW41/42 2 CHANNEL V3.11-47
    EC     ASYNC    OK
                    DHW41/2 V1.6
>>>
```

❶ Error Information—Write down this information before you contact your Digital services representative.

1.3.5 Error Display

You can use the error display to display certain errors detected during the last power-up test or diagnostic utility. To see the error display, enter the following command:

>>> **SHOW ERROR**

The system responds with a display similar to the following:

```
?? 001    CPU_BD  0000
          B_Cache  Test_35  Subtest_33  Loop_sub_27  Error_type_FF
            NVAX  Test_54  Subtest_00  Loop_sub_01  Error_type_FF
?? 001        DZ  0030
010 0001 00000031 00000020 00000000 00000002 00000000 0000F1F0
                  Test_E4  Subtest_02  Loop_sub_00  Error_type_FF
?? 020      COMM  0112
005 0014 001E001E 0F0F0311 01010002 00000000 0008001E 80000002 00000000
```

Write down this information before you contact your Digital services representative.

1.4 Contacting Digital Services

―――――――――――――――― **Warning** ――――――――――――――――

Only authorized service personnel should service the MicroVAX 3100
Model 85/95.

――――――――――――――――――――――――――――――――――――――

If you have followed the procedures in this chapter but the problem remains
unsolved, your Digital services representative can help you. Before you place
your call, follow these steps:

1. Write down a description of the problem, including the error messages and
   the number of the tests or utilities that failed.

2. Look at the status LED display on the back of the system unit and write
   down the numbers of the LEDs that are lit (see Figure 1–2).

3. List the steps you took to correct the problem as well and their results.

4. Write down the serial and model numbers of the system unit and any
   connected peripheral devices. These numbers are usually printed on a label
   on the back of the device.

Figure 1–2 Status LED Display

MLO-012035

1 Status LED Display

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Organization (structure of subject matter)	☐	☐	☐	☐
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MicroVAX 3100
Model 85/95

Installation Information

This manual describes how to install and test the MicroVAX 3100 Model 85 and Model 95.

This document was prepared using VAX DOCUMENT Version 2.1.

Contents

1 Installation Procedure

Figures

Preface

This manual describes how to install and test the MicroVAX™ 3100 Model 85 and
Model 95. It also refers to information on connecting the system to a network,
connecting external options to the system, and booting the operating system.

Audience

This manual is intended for anyone who wants to install the MicroVAX 3100
Model 85/95. It is written for both experienced and inexperienced users.

Structure of This Manual

The procedure for installing the MicroVAX 3100 Model 85/95 is presented in only
one chapter. Each section in the chapter represents a major step in the procedure
and contains detailed instructions to follow.

Additional Information

See the *MicroVAX 3100 Model 85/95 Operator Information* manual for the list of
related documents.

Conventions

The following conventions are used in this manual:

Convention	Description
MONOSPACE type	Text displayed on the screen is shown in monospace type.
italic type	Italic type emphasizes important information and indicates the complete titles of manuals.
Note	A note contains information that is of special importance to the user.

1

Installation Procedure

This chapter shows you, step by step, how to install the MicroVAX 3100 Model 85/95.

Step 1: Choosing a Suitable Location

Follow these guidelines when you choose where to place the system unit:

- Place the system unit where the room temperature is between 10°C and 40°C (50°F and 104°F) and the humidity is between 10% and 90%.

- Place the system unit at least 1 metre (3 feet) from heaters, photocopying machines, or other operating equipment.

- Place the system unit in a well-ventilated location.

- Place the system unit on a work surface, which is raised above the floor.

- Keep the air vents on either side of the system unit clear.

- Do not place the system unit on its side.

- Do not expose the system unit to direct sunlight or abrasive particles.

_____ **Note** _____

A console terminal is required for this installation, but is not supplied with the system. You can order one from your Digital™ sales representative.

_____

Step 2: Unpacking the System and Identifying the Parts

1. Unpack the system.

2. Make sure that you have all the parts listed on the packing slip. The following loose-piece accessory kit is shipped with all basic systems. If you do not have all the parts listed, contact your Digital Sales representative.
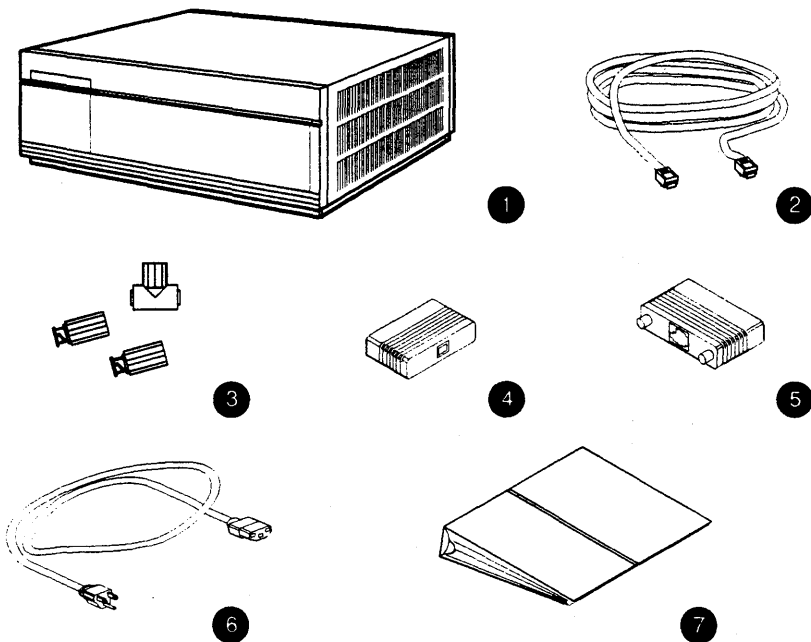
RE_EN06058A_91

● System Unit

❷ DEC423 Terminal Cable (BC16E-25)

❸ One ThinWire™ Ethernet T-Connector (H8223) and Two Terminators (H8225)

❹ Standard Ethernet Loopback Connector (12-22196-01)

❺ RS232 to DEC423 Adapter (H8575-A)

❻ Power Cord

❼ Documentation and Software Licenses

Step 3: Connecting the Console Terminal

1. Connect one end of the terminal cable to modified modular jack (MMJ) port 3.

2. Connect the other end of the terminal cable to a DEC423 (MMJ) communications port on the console terminal. If your terminal has only RS232 ports, use the RS232 to DEC423 adapter (H8575-A) to provide an MMJ port on the terminal.

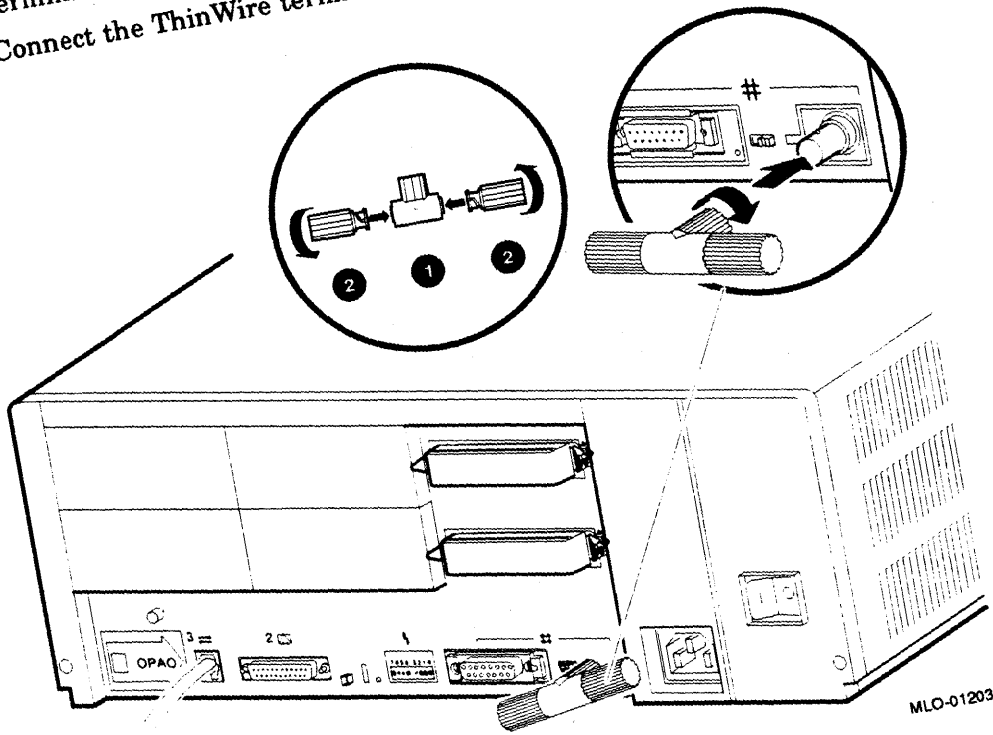3. If you want, remove the label covering MMJ ports 0 and 1.
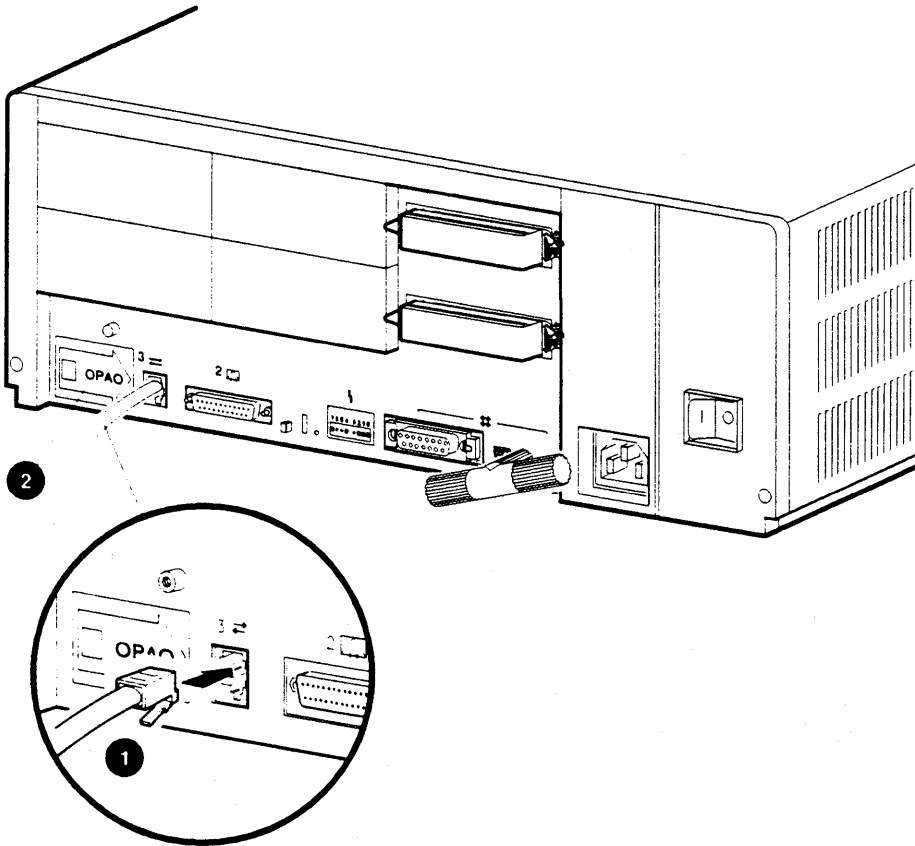
MLO-012030

❶ Terminal Cable

❷ Label

Step 4: Connecting the ThinWire Terminator

1. Assemble the T-connector and the two terminators to form a ThinWire terminator.

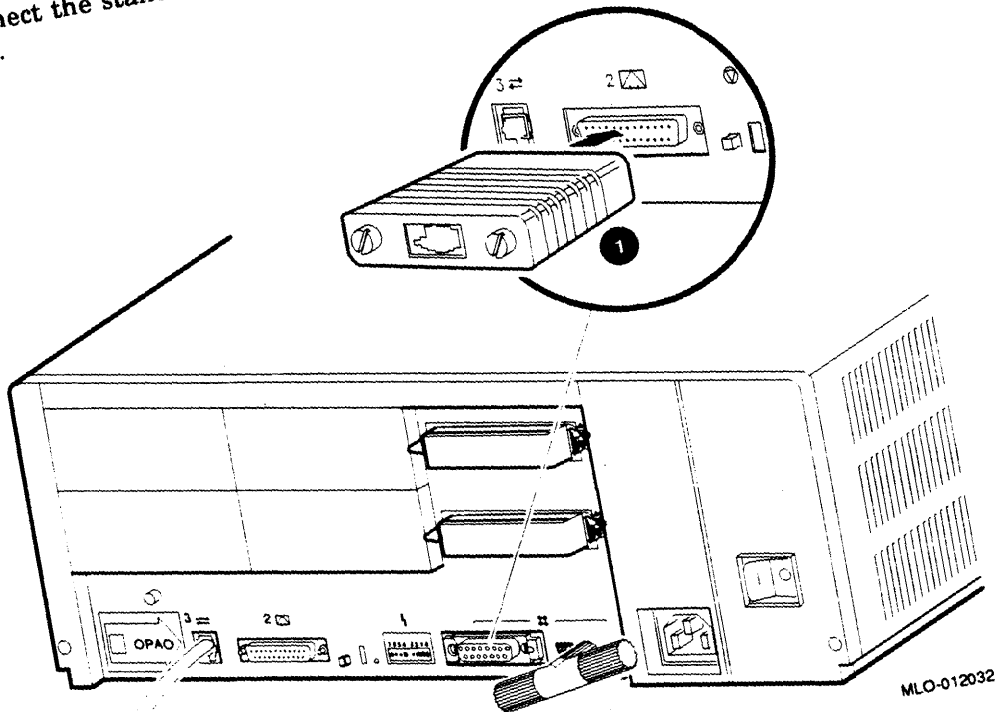2. Connect the ThinWire terminator to the system unit.

MLO-012031

❶ T-Connector

❷ Terminator

Step 5: Connecting the Standard Ethernet Loopback Connector

Connect the standard Ethernet loopback connector (12-22196-01) to the system unit.
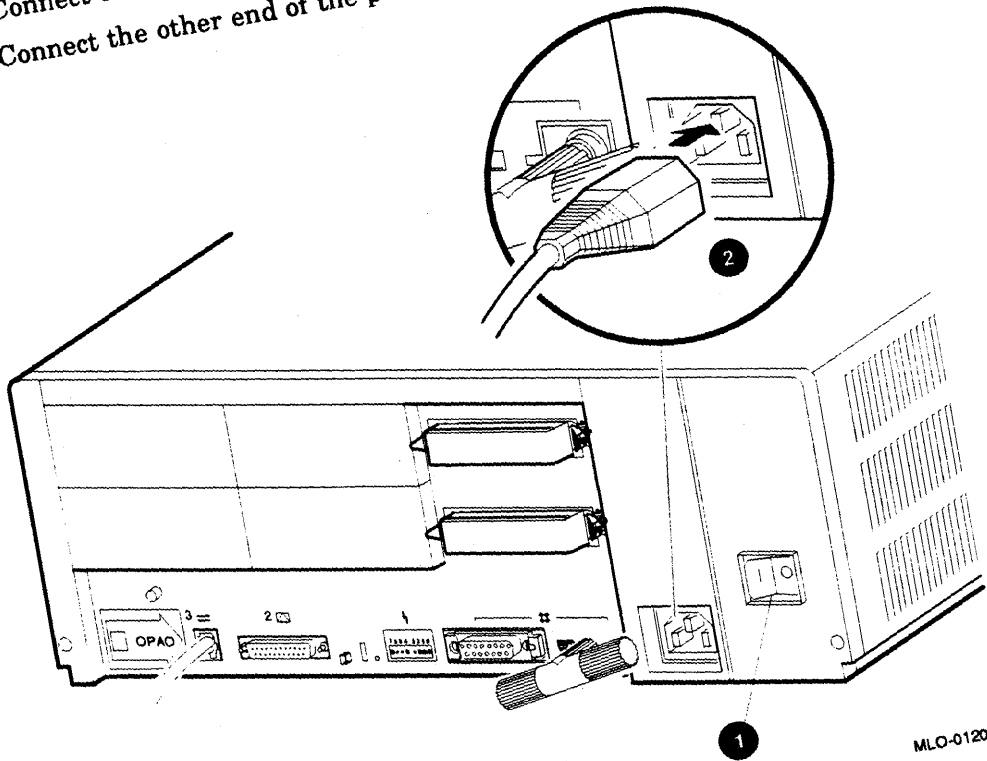

MLO-012032

❶ Standard Ethernet Loopback Connector (12-22196-01)

Step 6: Connecting the Power Cord

1. Ensure that the on/off switch is in the off (O) position.
2. Connect the power cord to the system unit.
3. Connect the other end of the power cord to an isolated, grounded circuit.

MLO-012033

❶ On/Off Switch

❷ Power Cord

Step 7: Turning on the Console Terminal and System Unit

1. Turn on the console terminal. Wait until it completes its power-up test. (See the terminal documentation for more information.)

2. Check the terminal settings. See the *MicroVAX 3100 Model 85/95 Operator Information* manual for the list of correct settings.

3. Turn on the system unit by setting the on/off switch to the on (I) position.
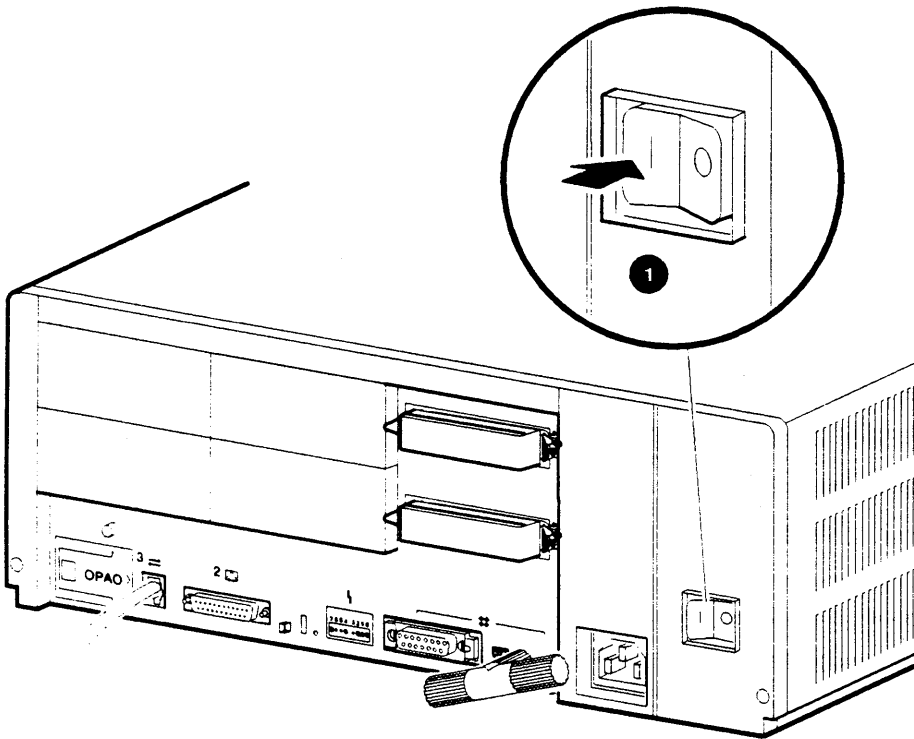
MLO-012034

❶ On/Off Switch

Step 8: Checking the Power-Up Test Results

The power-up test can take several minutes to complete, depending on the number of installed options you have and on which default settings you use:

- If the power-up test results on the screen are similar to the results in Figure 1–1, the system has passed the power-up test. Go to step 9.

- If the power-up test results on the screen are not similar to the results in Figure 1–1, the system has not passed the power-up test. Go to substep 1.

Figure 1–1 Successful Power-Up Test Screen

```
KA55-A or KA51-A V2.3, VMB 2.14  ❶
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..  ❷
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..
Tests completed.  ❸
>>>  ❹
```

❶ Central Processing Unit (CPU) name, Firmware version number, and Virtual Memory Boot (VMB) version number

❷ Read-Only Memory (ROM) based diagnostics countdown

❸ Status message

❹ Console prompt

1. Write down the error messages and the error summaries. Figure 1–2 shows an example of an error message and an error summary.

2. Set the on/off switch to the off (O) position.

3. Make sure that all the connections you made in step 3, step 4, step 5, and step 6 are correct.

4. Set the on/off switch to the on (I) position.

5. If an error report is still displayed, see the *MicroVAX 3100 Model 85/95 Troubleshooting and Diagnostic Information* manual.

Figure 1–2 Unsuccessful Power-Up Test Screen with an Error Report

```
KA55-A or KA51-A V2.3, VMB 2.14
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..

? Test_Subtest_31_05  Loop_Subtest=00  Err_Type=FF  DE_Memory_Setup_CSRs.lis ❶
Vec=0000  Prev_Errs=0000   P1=00000000   P2=01000000   P3=00000001  P4=00010000
P5=2101801C P6=00000007 P7=80000003 P8=0000CF4A  P9=00000001 P10=2006B8D8
r0=00000002 r1=21018000 r2=00000008 r3=81000000  r4=00000001  r5=01000000 ❷
r6=2006EB77 r7=21018048 r8=00000000 r9=20140758 r10=00000000 r11=FFFFFFFF
dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=FA00 pcadr=FFFFFFF8 pcctl=FC13
cctl=00000020 bcetsts=0360 bcedsts=0F00 cefsts=00019200 nests=00
mmcdsr=01FE6600 mesr=00000000

58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43.. ❸
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..

16 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 00000000 to 00FFFFFF, 16MB, 32768 good pages, 0 bad pages

Error:  SIMM Set 1 (1E,1F,1G,1H)                            ❹
  SIMM_1E = 64MB      SIMM_1F = 64MB      SIMM_1G = 64MB      SIMM_1H = 00MB ??

Total of 16MB, 32768 good pages, 0 bad pages, 104 reserved pages

Normal operation not possible. ❺
```

❶ Error message

❷ Error summary

❸ Power-up test completion

❹ Specific error information on the test that failed

❺ Status message

Step 9 and step 10 are optional. However, step 11 is mandatory.

Step 9: Connecting the System to a Network

If you want to connect the system to a network, see the *MicroVAX 3100 Model 85/95 Operator Information* manual.

Step 10: Connecting External Options to the System

If you want to connect external options to the system, see the *MicroVAX 3100 Model 85/95 Operator Information* manual.

Step 11: Booting the Operating System

The system is supplied with factory installed software (FIS) on the system disk. Boot the operating system following the procedures in the *OpenVMS™ Factory Installed Software User Information*.

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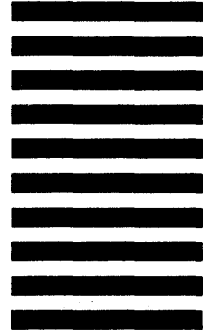
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