

# **MICROVAX II RELEASE NOTES**

AA-FMBAA-TN

**MS630-CA Technical Information for MicroVAX II-  
based systems**

## 1 DESCRIPTION OF MS630-CA MEMORY MODULE

The MS630-CA memory module, shown in Figure 1, is a standard, quad-height memory module that contains 8 megabytes of MOS memory storage. It employs 256K x 1-Bit Dynamic RAMs (DRAMs) in a ZIP (Zig Zag In-line Package) configuration. This packaging allows a two-fold increase (over conventional DRAM DIP packaging) in the number of DRAMs that can be mounted on the circuit board. The 8 megabyte array consists of eight banks, with thirty-six 256K x 1 DRAMs in each bank.

The MS630-CA is a parity memory, and does not perform any error correction. Since parity is generated on-board, via parity control logic in the board's data transceivers, errors are detected on-board and reported to the KA630 CPU module.

The MS630-CA provides the same features and performance (except for capacity) as the MS630-BA and -AA modules. The MS630 can be used in any combination with other MS630 memory modules, which provides flexibility in terms of memory configuration for the MicroVAX II. The maximum physical address space of the MicroVAX II is 16 megabytes. There is one configuration where 17 Mbytes (two MS630-CA modules and the megabyte from the CPU module). Under this configuration, the megabyte of memory on the KA630-A CPU module is not used.

## 2 ORDERING INFORMATION

MS630-CA 8 Mbyte module	M7609-AA
50-pin CPU memory in- terconnect cable (in- cluded)	17-00716-00

## 3 OPERATING SYSTEM SUPPORT

MicroVMS	Version 4.1m and later
ULTRIX-32m	Version 1.1 and later
VAXELN	Version 2.0 and later

### NOTE:

The PQL\_DWSDEFAULT SYSGEN parameter is set incorrectly for most 16 MB MicroVAX II systems, and will cause the following error message to be displayed every time these systems are booted: %SYSBOOT\_W\_WS, default and quota raised to PHD+MINWSCNT. There is no harm caused due to the low SYSGEN parameter value, and the customer can work around the error message by raising the value of the PQL\_DWSDEFAULT SYSGEN parameter. This parameter will be modified in a future release of MicroVMS.

### NOTE:

When using the "SHOW MEMORY" utility under MicroVMS, a "BAD PAGE" is indicated whenever one or two 8 Mbyte memory modules are used in the system. A "PAGE" in this instance refers to a 512 byte block. When the total system memory equals 13 Mbytes (one MS630-CA memory module installed), one "BAD PAGE" will appear in response to the "SHOW MEMORY" command. When the total system memory equals 16 Mbytes (two MS630-CA memory modules installed), two "Bad Pages (1024 bytes) will be indicated. The

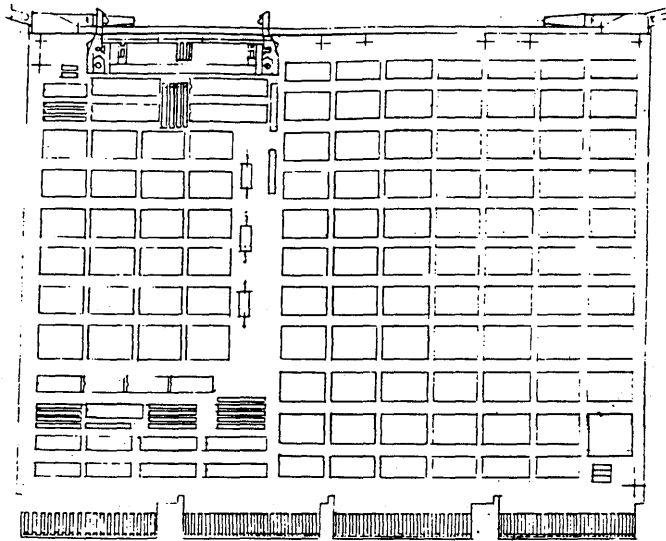
MDM diagnostic used to test the MS630-CA will not indicate these pages as "BAD", but rather indicates that these pages are "IN-USE" for supporting the console program (thus, they are not tested by MDM).

#### 4 DIAGNOSTIC SUPPORT

MicroVAX Maintenance System  
Power-up self-test

version 113 and later  
No LEDs

Figure 1 The MS630-CA memory module



#### 5 INTERCONNECT INFORMATION

The MS630-CA modules interface with the KA630-A CPU through the MicroVAX local memory interconnect in the CD rows of slots 1 through 3 of the backplane, and through a 50-pin cable. This cable is installed between J1 of the KA630-A CPU and the corresponding connector on one or both MS630 modules.

## 6 ADDRESS, VECTOR, AND SWITCH SETTINGS

No hardware settings are necessary on MS630 memory modules. Memory module addresses are automatically determined by their position in the backplane.

### CAUTION:

MS630-BA and -BB modules can only be installed in slots 2 or 3. They must NOT be installed in Q22-Bus slots. MS630-AA modules can only be installed in the CD rows of slots 2 or 3.

## 7 CURRENT AND POWER VALUES FOR THE MS630-CA

### NOTE:

This section provides the current and power values to be used when configuring a system which includes the MS630-CA. For information on the values for other components in a MicroVAX II system, refer to Table 5-4 of the MicroVAX System Maintenance Guide (AZ-GM3AB-MN).

The MS630-CA module draws 2.11 amps of current at +5V, for a total power consumption of 10.55 watts. The module draws no current at +12V, nor does it present any AC or DC bus loads.

## 8 MDM Tests, Utilities, and Error Messages

### 8.1 Customer Tests

1. FUNCTIONAL VERIFY-checks bitmap created during power-up diagnostics, fails if bitmap shows any missing pages.
2. EXERCISER-Copies bitmap generated during power-up, turns off the interrupt, and turns the bit for a particular page of memory off, turns interrupt back on, and then exercises the corresponding memory page. Performs pattern check and check for soft parity error. All accesses to memory are done through the Q22-bus mapping register. When testing for a particular page is completed, the bit in the bitmap corresponding to that page is returned to the on position. This procedure is repeated for each bit in the map.

### NOTE:

The exerciser should take no more than 1 minute per megabyte of memory.

### 8.2 Service Tests

### NOTE:

All the tests listed in the Customer Tests section above are also available in Service Tests.

### 8.3 Utilities

### NOTE:

Utilities are available only with the Service Version of MDM.

1. UTILITY #1-performs the same check as the functional verify test, but prints out memory map, including bad areas, instead of passing or failing.

2. UTILITY #2-Destroys contents of memory, and performs endless stand-alone memory test (the same tests as in the power-up diagnostics). Prints summary of test results on 1st, 10th, 20th, passes, etc.

**NOTE:**

**Once this test is performed, anything needed in system memory (MDM, the operating system, etc.) will have to be rebooted.**

#### **8.4 Error Messages**

ERR\_MEM\_10-Illegal FRU indication in MSER  
ERR\_MEM\_11-Master bit map shows memory error on KA630 board  
ERR\_MEM\_12-Master bit map shows memory error in expansion module #1  
ERR\_MEM\_13-Master bit map shows memory error in expansion module #2  
ERR\_MEM\_14-Parity error during exerciser test  
ERR\_MEM\_15-Bad data found during exerciser test  
ERR\_MEM\_992-Could not extend PO space to switch to physical addressing  
ERR\_MEM\_993-Could not allocate page table entry  
ERR\_MEM\_994-Could not allocate contiguous space in I/O region  
ERR\_MEM\_995-Could not transfer control to MEMTEST procedure  
ERR\_MEM\_996-Could not force bad parity  
ERR\_MEM\_997-Master bit map found in corrupted state  
ERR\_MEM\_998-Could not locate master bit map  
ERR\_MEM\_999-Full complement of memory not found

## **RD54 Technical Information for MicroVAX II-based systems**

## 1 DESCRIPTION OF RD54 DISK DRIVE

The RD54 is a 150 Mbyte 133.4 cm (5.25 in) fixed disk drive. The RD54 can be controlled by the RQDX3 MSCP controller. The RD54 drive is shown in Figure 1.

## 2 RD54 DISK DRIVE ORDERING INFORMATION:

RD54 disk kit (BA23-A or H9642)	RD54-AA
RD54 disk drive	RD54-A
20-pin cable to signal distribution	17-00282-00
34-pin cable to signal distribution	17-00286-00
RD54 disk kit (BA123)	RD54-BA
RD54 disk drive	RD54-A
20-pin cable to signal distribution	17-00282-01
34-pin cable to signal distribution	17-00286-01
Control panel assembly	70-22393-01

## 3 OPERATING SYSTEM SUPPORT:

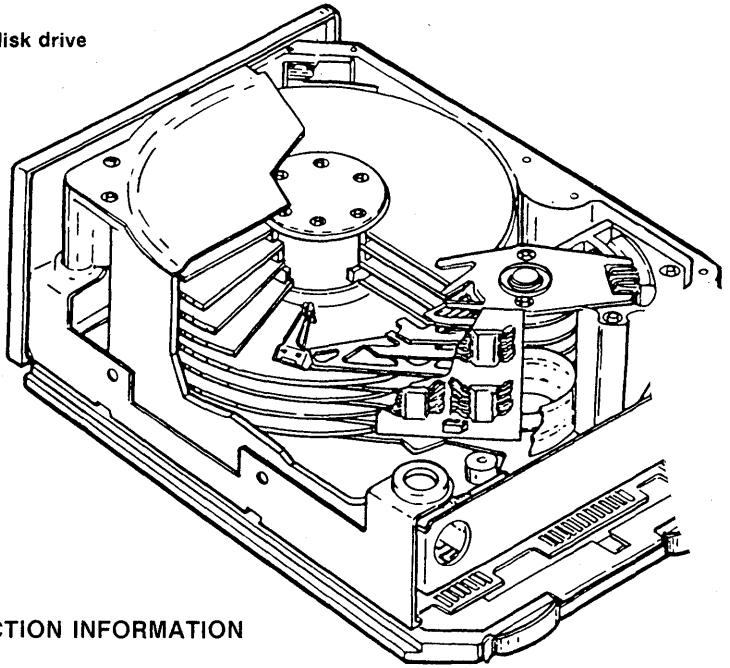
MicroVMS	Version 4.1m and later
ULTRIX-32m	Version 1.2-a and later
VAXELN	Version 2.0 and later

## 4 DIAGNOSTIC SUPPORT:

MicroVAX Maintenance System	Revision 1.13 and later
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**Figure 1 The RD54 disk drive**



## **5 INTERCONNECTION INFORMATION**

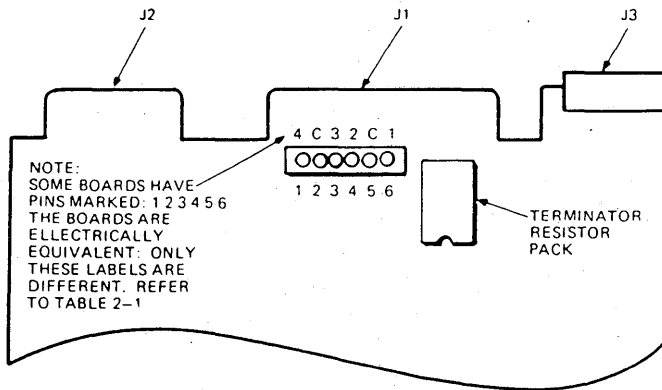
The RD54 disk drive is connected to a MicroVAX II system via by means of one 20-pin cable, and one 34-pin cable. The length of the cable depends on the enclosure in which the drive is to be installed. The correct part numbers for the cable are given under Ordering Information above.

## **6 DRIVE SELECTION**

The RD54 drive has jumpers that determine the drive select lines to which the drive responds. The jumpers are located on the printed circuit board assembly, shown in Figure 2. The drive select number, and the corresponding pins to be jumpered, are as follows:

<b>JUMPER BLOCK FUNCTION</b>	<b>PIN NUMBERS</b>	<b>ALTERNATE PIN NUMBERS</b>
Drive Select 0	1,C	5,6
Drive Select 1	2,C	4,5
Drive Select 2	3,C	2,3
Drive Select 3	4,C	1,2

**Figure 2 Drive select jumpers on the printed circuit board**



When an RD54 drive is used as a single fixed-disk drive in a BA23 enclosure, it should be configured to respond to drive select line 3 (DS3). This will make the drive RD0.

When RD54 drive is used in a BA123 enclosure, drive numbering is determined by the choice of connectors used on the M9058 distribution board. Provided the M9058 board is set to factory configuration, jumpers on the RD54 drive has no effect.

## 7 Current and Power Values for the RD54

### NOTE:

This section provides the current and power values to be used when configuring a system which includes the RD54. For information on the values for other components in a MicroVAX II system, refer to Table 5-4 of the MicroVAX System Maintenance Guide (AZ-GM3AB-MN).

The RD54 disk drive draws 1.7 amps at +5V and 1.57 amps at +12V, for a total power consumption of 27.34 watts.

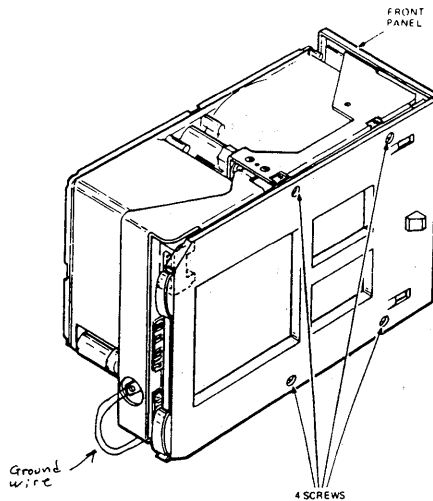
## 8 PRINTED CIRCUIT BOARD ASSEMBLY REMOVAL AND REPLACEMENT

The printed circuit board assembly (PCBA) is the only Field Replaceable Unit (FRU) within the drive itself. In the case of drive failure, always try replacing the printed circuit board before replacing the entire drive.

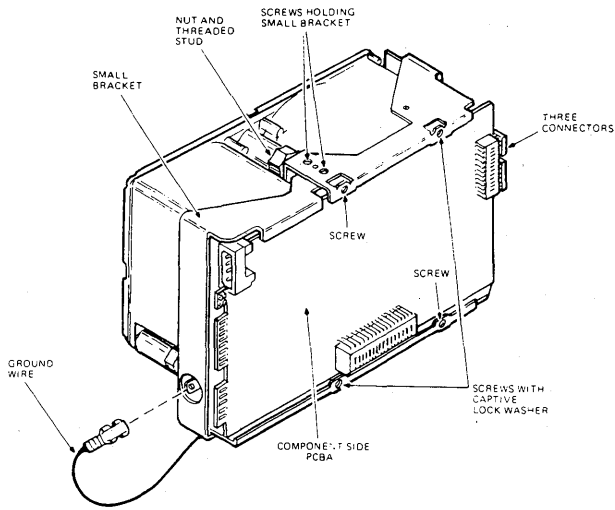
## 8.1 PCBA REMOVAL

1. Locate the four screws holding the skid plate to the casting (Figure 3).
2. Using a phillips screwdriver, remove these four screws.
3. Remove the skid plate
4. Disconnect the green ground wire from J4 (Figure 4)
5. Locate the four screws holding the small bracket (Figure 4).
6. Using a phillips screwdriver, remove these four screws. There are two on each side of the bracket.
7. Remove the small bracket.
8. Using a 3/8 inch open-end wrench, rotate the nut on the threaded stud (Figure 4) until the stud is free of the casting.
9. Remove the four screws holding the PCBA to the casting. Only two of these screws will have captive lock washers. Note their location.
10. Using a thin screwdriver as an aid, carefully remove the three connectors at the front of the drive.
11. Gently slide the PCBA as far as it will go in the direction shown in Figure 5.
12. Swing the board up as shown in Figure 6. It may be necessary to pull the bracket back slightly. Do not pull the bracket back more than is necessary to remove the board. do not flex the PCBA when removing it.
13. Remove the remaining connect on the side of the PCBA. Place the PCBA aside.
14. Do not remove the paper insulator.

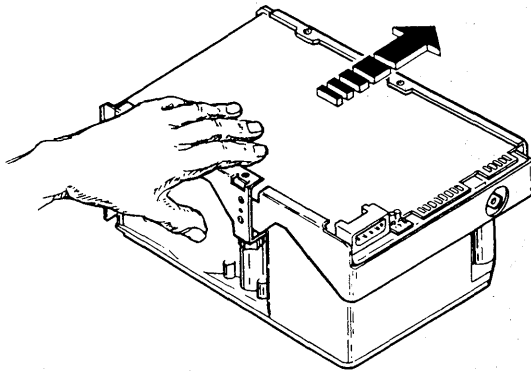
**Figure 3 Skid plate removal**



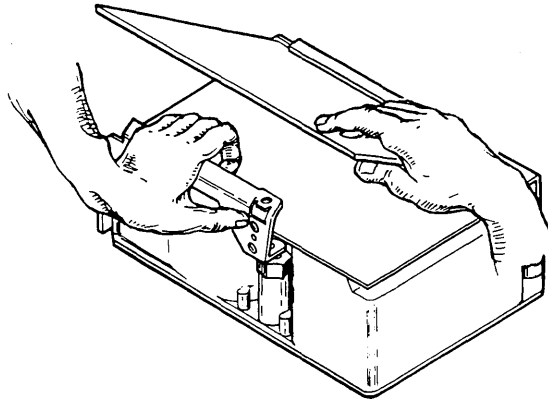
**Figure 4 Drive disassembly**



**Figure 5 Sliding the PCBA as far as it will go.**



**Figure 6 Swing the PCBA up**



## **8.2 REPLACING THE PCBA**

1. Make sure the paper insulator is in place.
2. Replace the connector on the side of the PCBA that was removed last during the removal procedure.
3. Place the edge of the PCBA against the bracket as shown in Figure 6, then lay the PCBA flat against the paper insulator.
4. Reconnect the other three connectors to the PCBA.
5. Replace the four screws holding the PCBA to the casting. Make sure that the two screws with captive washers are in the proper locations.

### **NOTE:**

To avoid stripping the threaded stud, Replace the large bracket exactly as described here.

6. Place the threaded stud over the hole in the casting.
7. Using a 3/8 inch open-end wrench, turn the nut on the threaded stud counterclockwise at least one half turn. This will align the threads and prevent them from being stripped.
8. Tighten the threaded stud by turning the nut clockwise.
9. Replace the small bracket.
10. Reconnect the green ground wire.
11. Replace the skid plate.

## **9 USING MDM TO FORMAT THE RD54**

### **NOTE:**

If an RD54 drive is added to the system, it must be formatted. The formatting utility is available in the service version of the MicroVAX Maintenance System. Consult Chapter 6 of the MicroVAX Maintenance Guide (AZ-GM3AB-MN) for further information.