

DEC 7000/10000 AXP Technical Bulletin Number 2

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This document accompanies the release of the DEC OSF/1 AXP Version 1.3 operating system used on DEC 7000 and DEC 10000 systems. This document contains new information that was not available when the DEC 7000/10000 AXP manuals were first published. Service information for the MS7BB module is provided.

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Section 1

Introduction

This technical bulletin provides information to update the DEC 7000/10000 documentation set.

Hardware changes to the KN7AA processor module now allow the following to be supported:

- Multiprocessing with up to six processor modules (applies to Open-VMS AXP systems only) — enabled by the LEVI-A pass 3 chip and a revised module (E2040-AB).
- Interleaving with any number of memory modules (applies to Open-VMS AXP systems and DEC OSF/1 AXP systems) — enabled by the LEVI-A pass 3 chip.

Changes and enhancements discussed in detail are:

- Booting from a DEFAA adapter
- DEC Verifier and Exerciser Tool (VET)
- MS7BB memory module

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Section 2

User Information

Topics discussed in this section include:

- Booting from a DEFAA Adapter
- Using the DEC Verifier and Exerciser Tool (VET)

2.1 Booting from a DEFAA Adapter

This section shows how to boot from an InfoServer using the FDDI LAN (local area network) and the DEFAA adapter. First issue the show network command, followed by the boot command. After the load is complete, choose the service for the operating system.

Example 2-1 Booting

```
>>> show network ❶
polling for units on defaa0, slot 6, fbus0...
ffa0.0.0.6.0 08-00-2B-0B-BB-ED
>>> boot ffa0 -file apb_015 ❷
Initializing...
F E D C B A 9 8 7 6 5 4 3 2 1 0 NODE # ❸
      A M . . . . . P P TYP
      o + . . . . . + + ST1
      . . . . . E B BPD
      o + . . . . . + + ST2
      . . . . . E B BPD
      + + . . . . . + + ST3
      . . . . . E B BPD

      . . . . + . . . + + . . . . C0 FBUS +
      . . . . . . . . . . . . . . C1
      . . . . . . . . . . . . . . C2
      . . . . . . . . . . . . . . C3

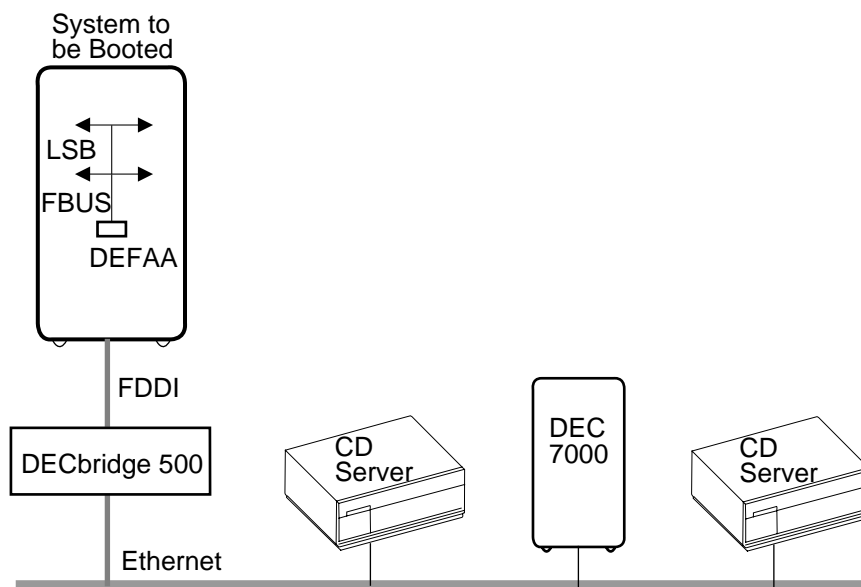
      . A0 . . . . . ILV
      .128 . . . . . 128MB
Firmware Rev=V3.0-4279[A52] SROM Rev=V2.2-0 SYS SN=GA01234567
Booting...
Connecting to boot device ffa0 -file apb_015
Created device: ffa0.0.0.6.0

Requesting MOP Assistance Volunteer.....
MOP Assistance Volunteer found.
Loading...
.....
Load complete! ❹
```


Insert the compact disk that contains the operating system into an InfoServer. Example 2-1 shows how to begin the boot process.

- 1 **Show network** displays information about network controllers. Polling checks the Futurebus+ for device configurations. **Show network** includes information such as the device mnemonic (defaa0), the console device name of the network device with path information (ffa0.0.0.6.0), and the FDDI controller's hardware address in hex (08-00-2B-0B-BB-ED).
- 2 The **boot** command specifies the console device name of the network device **ffa0**, followed by the initial system load file name **apb_015**.
- 3 System self-test results are displayed if the environment variable **boot_reset** is set **on**.
- 4 After the load is complete, the Network Initial System Load Function menu is displayed. From the services listed, you choose the service for the operating system CD-ROM.

Figure 2-1 InfoServer Booting Using a DEFAA Adapter



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2.2 Using the DEC Verifier and Exerciser Tool (VET)

The DEC Verifier and Exerciser Tool (VET) is now available on DEC 7000 and DEC 10000 systems. You can run DEC VET as part of an installation verification procedure and as a system exerciser under the OpenVMS AXP and OSF/1 operating systems. Example 2-2 shows a sample DEC VET user session. See the *DEC Verifier and Exerciser Tool User's Guide* (AA-PX73A-TE) for more detailed information.

Example 2-2 Sample DEC VET User Session

```

CPU2> vet ❶
    Running system sizer on node cpu2 ... please wait.

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VET_setup> load ❷
    Enter number of processes for CPU device (decimal [1]): 2 ❸
    Enter number of processes for MEMORY device (decimal [1]): 2
    Enter number of processes for NETWORK device (decimal [1]): 0
    Enter number of processes for FILE device (decimal [1]): 2
    Enter number of processes for each DISK device (decimal [1]): 0
...opening script file $19$dka500:[sys0.][sysmgr]vet_load.script.
Process 1, group exer for device CPU
Process 2, group exer for device CPU
Process 3, group exer for device MEMORY
Process 4, group exer for device MEMORY
Process 5, group exer for device FILE
Process 6, group exer for device FILE

...closing script file $19$dka500:[sys0.][sysmgr]vet_load.script.
VET_setup> start ❹
...starting [Process 1, Pass 1] group exer for device CPU.
...starting [Process 2, Pass 1] group exer for device CPU.
...starting [Process 3, Pass 1] group exer for device MEMORY.
...starting [Process 4, Pass 1] group exer for device MEMORY.
...starting [Process 5, Pass 1] group exer for device FILE.
...starting [Process 6, Pass 1] group exer for device FILE.
...completed [process 1] group exer for device CPU.
...completed [process 2] group exer for device CPU.
...completed [process 5] group exer for device FILE.
...completed [process 6] group exer for device FILE.
```

Table 2-1 lists the DEC VET exercisers and descriptions.

Table 2-1 DEC VET Exercisers

Exerciser	Description
CPU	Tests processor functions including binary operations, integer computations, floating-point computations, and data conversion.
Memory	Tests dynamic allocation and deallocation of virtual memory and verifies test patterns written.
Disk	Tests logical and physical disk I/O by performing read and write operations and verifies test patterns written.
File	Tests reading and writing to disk files and verifies test patterns written.
Tape	Tests reading and writing to tape device files and verifies test patterns written.
Network	Tests underlying protocol (including caches, buffers, and queues), physical network adapters, local and remote networks, destination adapters, and network services.

- ❶ In Example 2-2, the user enters the command **vet** at the system prompt. The system sizer message is displayed. The system sizer process finds the devices that are connected to the system and obtains device information needed by the VET programs.
- ❷ At the VET_setup prompt, the user issues the command **load**. The load command creates processes for most devices on the system.
- ❸ The VET program displays a series of questions. The user can select the number of processes to run for each device type. In the example, two processes are selected for the CPU device, memory device, and file device.
- ❹ Enter the command **start** to begin testing.

Example 2-2 Sample DEC VET User Session (Continued)

```
^C 5
...stopping [Process 4] group exer for device MEMORY.
...stopping [Process 3] group exer for device MEMORY.
VET_suspend> show runtime 6
Process 1 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   0 minutes  22 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 2 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   0 minutes  22 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 3 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  39 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 4 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  39 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 5 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   2 minutes  30 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 6 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  20 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

VET_suspend> continue 7
...continuing [process 3] group exer for device MEMORY.
...continuing [process 4] group exer for device MEMORY.
...completed [process 3] group exer for device MEMORY.
...completed [process 4] group exer for device MEMORY.

...testing completed. Total errors reported by all processes = 0. 8
VET_setup> exit 9
CPU2>
```

- ⑤ The user enters a Ctrl/C to suspend executing processes. DEC VET enters the suspend execution state.
- ⑥ Enter **show runtime** to list the requested, elapsed, and remaining run times of each process.
- ⑦ The **continue** command resumes execution of all suspended processes. After testing is completed, a message is displayed to inform the user of the number of errors reported. No errors were reported in this example (see ③).
- ⑧ Enter **exit** to exit the DEC VET program. The system prompt is displayed.

Section 3

MS7BB Module Service Information

This section contains service information for the MS7BB module that is used in DEC OSF/1 AXP systems. The MS7BB is a battery backup memory module that is capable of storing 16 Mbytes of memory for up to 48 hours during a system power interruption. When system power is restored, the local memory remains protected until control of the memory is returned to the memory interface controller (MIC).

The module has 16 Mbytes of memory and a battery pack. The battery pack contains 14 batteries in two "strings"; each string has 7 batteries. The battery pack is a field-replaceable unit (FRU).

The *Guide to Prestoserve* (order number AA-PQT0A-TE) contains information on how to register the Prestoserve software license and how to reconfigure the system when adding Prestoserve support. Be sure to take this manual with you when installing an MS7BB module.

*NOTE: The MS7BB module is fully charged and functional 16 hours after **each system power-up**. Battery backup service is in effect only after this 16-hour charge-up period has expired.*

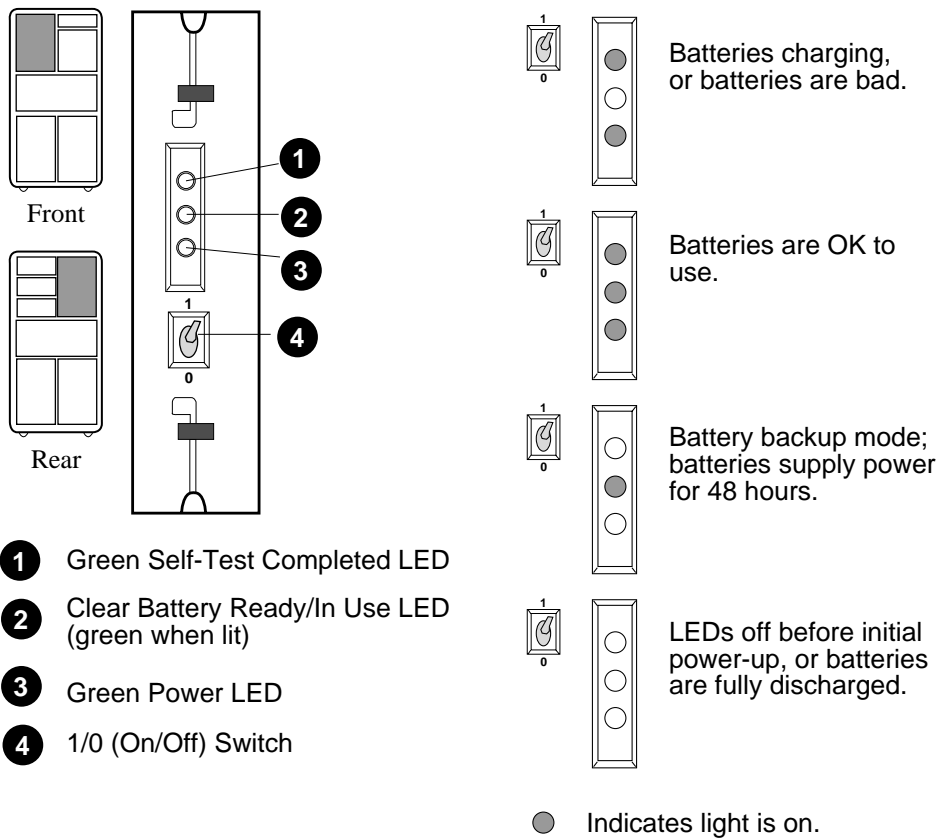
Topics in this section include:

- Switches and LEDs
- Installing the MS7BB Module
 - Install the Module
 - Check the Self-Test Display
 - Check the Module After Power-Up
- Console Commands
 - Prcache Command
 - Test Command
- DEC OSF/1 Presto Command
- Battery Pack Removal and Replacement
- Removing the MS7BB Module

3.1 Switches and LEDs

The MS7BB module has one switch, two green LEDs, and one clear LED as shown in Figure 3-1.

Figure 3-1 MS7BB Module



- 1 Green Self-Test Completed LED
- 2 Clear Battery Ready/In Use LED (green when lit)
- 3 Green Power LED
- 4 1/0 (On/Off) Switch

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The following tables list the functions of the MS7BB switch and LEDs.

NOTE: The module ships with the switch set to 0. Set the switch to 1 before powering up the system.

Table 3-1 MS7BB Switch

Position	Meaning
1 (On)	Enables battery backup.
0 (Off)	Disables the batteries from powering the module during shipment or servicing.

Table 3-2 MS7BB LEDs

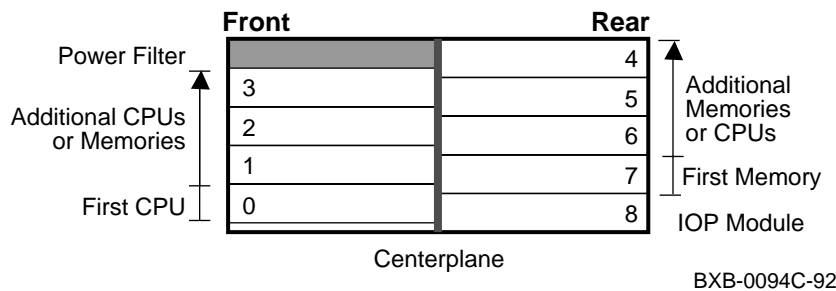
LED	State	Meaning
Self-Test Completed	On	Self-test completed.
	Off	Self-test did not complete.
Battery Ready/In Use	On	Batteries are OK, or MS7BB is in battery backup mode.
	Off	Batteries are charging. At power-up, there is a 16-hour charge-up period; this LED goes on at the end of the charge-up period. If the LED remains unlit, then the batteries are bad.
Power	On	System power is present on the module.
	Off	System power is not present on the module.

3.2 Installing the MS7BB Module

3.2.1 Install the Module

Install the MS7BB module in any empty LSB card cage slot that is reserved for additional CPUs or memories (see Figure 3-2).

Figure 3-2 LSB Card Cage (Top View)



Use the following procedure to install the MS7BB module in the LSB card cage.

1. Perform an orderly shutdown of the system.
2. Turn the keyswitch on the front control panel to the Disable position and wait for the control panel yellow Fault LED to stop flashing. When the Fault LED stops flashing, power has been removed from the LSB backplane and you may safely proceed.
3. Open the cabinet door by holding the recessed handhold and pulling it toward you.
4. Put on the antistatic wrist strap.

CAUTION: You must wear a wrist wrap when you handle any modules.

5. Release the plate covering the LSB card cage by loosening the two screws at the top of the plate. The plate is hinged and is supported by a cable.
6. Remove the filler module from the slot where you will install the MS7BB module.

7. On the MS7BB module, pull out the two black restraining clips to the right and pull the levers out until they are perpendicular to the front edge of the module.
8. Hold the module securely with both hands and gently guide it into the card cage. Make sure you align the bottom and top module tracks with the tracks in the card cage slot (see Figure 3-3).

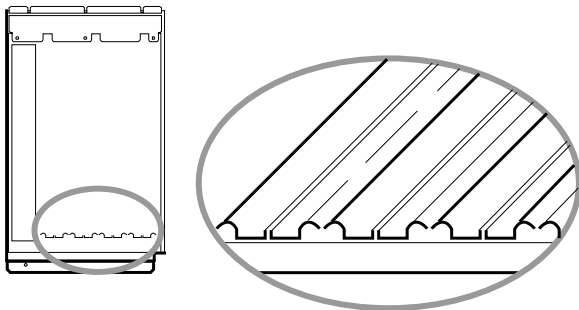
When the module is fully inserted, the front of the module will be flush with the card cage. The module does not click when it is fully inserted.

9. Holding the two metal tabs, push both of them toward the edge of the module simultaneously. Check that the ends of the metal tabs are fitting into the guides of the card cage slot.
10. Snap the black restraining clips across the levers to secure the module.
11. Set the MS7BB switch to 1. See Figure 3-1.

*NOTE: The module is ready to save data in the event of a power outage when the MS7BB switch is set to 1 (On) and the 16-hour charge-up period is over. **You will lose the data stored on the module if the switch is set to 0 (Off).***

12. Close and secure the card cage cover by tightening the two screws.
13. Close the cabinet door.

Figure 3-3 Inserting a Module in the LSB Card Cage



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3.2.2 Check the Self-Test Display

The next step is to power up the system and check the self-test display. Example 3-1 shows a self-test display with an MS7BB module in LSB slot 5.

Example 3-1 Self-Test Results

Initializing...

```

F E D C B A 9 8 7 6 5 4 3 2 1 0 NODE #
      A M M M ① . . . P TYP
      o + + + . . . + ST1
      . . . . . . . B BPD
      o + + + . . . + ST2
      . . . . . . . B BPD
      + + + + . . . + ST3
      . . . . . . . B BPD

      . . + . . + + . . . + . . C0 XMI +
      . . . . . . . . . . . . C1
      . . . . . . . . . . . . C2
      . . . . . . . . . . . . C3

      . A1 A0 . ② . . . . ILV
      . 64 64 . . . . . 128MB

```

Firmware Rev = V2.5-1625 SROM Rev = V1.0-0 SYS SN = GAO1234567

>>> show config ③

	Name	Type	Rev	Mnemonic
LSB				
0+	KN7AA	(8001)	0000	kn7aa0
5+	MS7BB	(4002)	0000	ms7bb0 ④
6+	MS7AA	(4000)	0000	ms7aa0
7+	MS7AA	(4000)	0000	ms7aa1
8+	IOP	(2000)	0006	iop0
C0 XMI				
				xmi0
1+	DEMNA	(0C03)	0803	demna0
3+	KZMSA	(0C36)	5144	kzmsa0
8+	DWLMA	(102A)	0003	dwlma0
9+	CIXCD	(0C2F)	0111	cixcd0
C+	KDM70	(0C22)	2901	kdm700

14. Power up the system and check the self-test display.

*NOTE: Do not boot the DEC OSF/1 operating system until you have completed step 15. You must be in console mode when you enter the **prcache -f** command.*

15. **After the 10-minute initial charge period**, enter the console command **prcache -f** to check the battery status. Battery status should be reported as: OK-charging. See Section 3.3.1 for information on the **prcache -f** command.
16. Enter the console command **prcache -b** to set the battery replacement date. The system response is:
Next battery replacement date (mmm-yyyy) ?
Type the present month (mmm), and add two years to the present year (yyyy).
For example, if you install an MS7BB module in November 1993, you would enter the following battery replacement date: nov-1995.
17. Boot the DEC OSF/1 operating system and install the software license. See the *Guide to Prestoserve* (order number AA-PQT0A-TE).

NOTE: If you wish to test the MS7BB module under the DEC OSF/1 operating system before the 16-hour charge-up period has expired, see Appendix A.

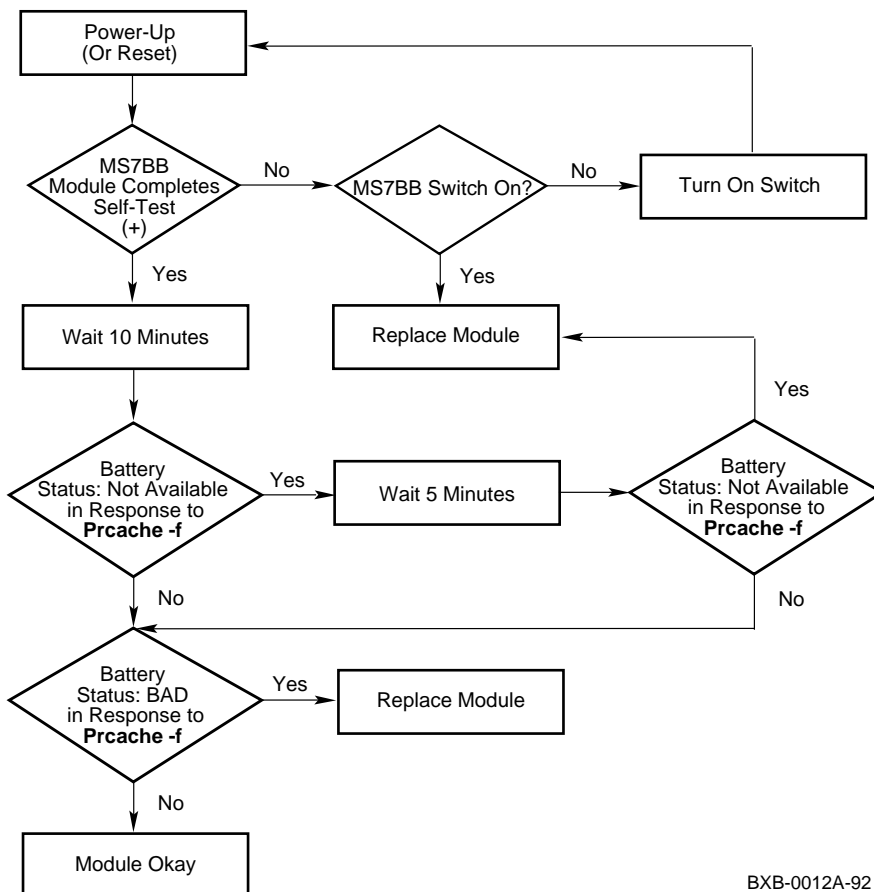
In Example 3-1:

- ❶ The plus sign (+) on the ST1 line indicates that the MS7BB module in LSB slot 5 completed self-test.
NOTE: A minus sign (-) on the ST1 line for the MS7BB module indicates that the module failed, or that the MS7BB switch is set to 0. Set the switch to 1 and reboot the system.
- ❷ The MS7BB module is not configured as system memory. A dot (.) appears on the ILV line and the MB line.
- ❸ The user enters the command **show config** to see the system hardware configuration.
- ❹ The module mnemonic is ms7bb0.

3.2.3 Check the Module After Power-Up

Figure 3-4 shows how to diagnose problems with the MS7BB module following power-up. Figure 3-5 shows how to check the battery status during and after the 16-hour charge-up period. Contact the installation site by telephone and have the customer enter the presto -p command to confirm that the batteries are charging (2 hours after power-up) and that the batteries are fully charged (16 hours after power-up).

Figure 3-4 Power-Up Troubleshooting Flowchart



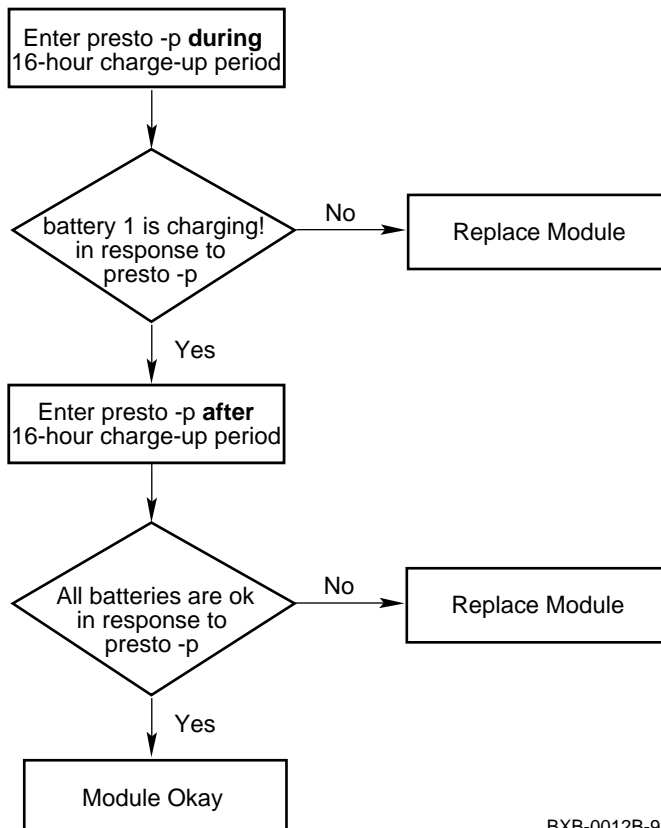
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Figure 3-4 shows the steps to take if a minus sign (-) is recorded on the self-test display ST1 line for the MS7BB module during initial power-up. See Section 3.3.1 for more information on the **prcache** command.

Figure 3-5 shows how to troubleshoot the MS7BB module during and after the 16-hour charge-up period.

*CAUTION: The MS7BB batteries may fail during the 16-hour charge-up period even though initial power-up data reports that the batteries are okay and charging. It is recommended that you enter the **presto -p** command after the 16-hour charge-up period to ensure that the batteries are fully charged. See Section 3.4 for more information on the **presto -p** command.*

Figure 3-5 Charge-Up Period Troubleshooting Flowchart



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3.3 Console Commands

3.3.1 Prcache Command

When in console mode, enter the command `prcache -f` to check configuration information and battery status. `Prcache -z` allows you to clear valid data; zeros are written to memory. To set the battery replacement date, enter the command `prcache -b`. Example 3-2 shows sample outputs of the `prcache` command.

Example 3-2 Prcache Command Sample Output

1.

```
>>> prcache -f                # User enters command
NVRAM Test Status: failed    # immediately after power-up.
Size: 16MB
Base Address: 04000000
System ID: CHIC01
State: not in use
Battery Status: not available
Battery Disconnect Status: battery disabled ❶
Battery Replacement Date:
>>>
```

2.

```
>>> prcache -f                # User enters command during
NVRAM Test Status: passed    # 10-minute initial charge
Size: 16MB                   # period.
Base Address: 04000000
System ID: CHIC01
State: not in use
Battery Status: not available ❷
Battery Disconnect Status: battery enabled
Battery Replacement Date:
>>>
```


Example 3-2 Prcache Command Sample Output (Continued)

3.

```
>>> prcache -f                                # User enters command after
NVRAM Test Status: passed                     # 10-minute initial charge
Size: 16MB                                    # period.
Base Address: 04000000
System ID: CHIC01
State: not in use
Battery Status: OK-charging ③
Battery Disconnect Status: battery enabled
Battery Replacement Date:
>>>
```

In Example 3-2, the first sample output shows that the battery disconnect status is "battery disabled" (①). This indicates that the MS7BB switch is set to 0. Self-test results may also indicate this state (see Section 3.2.3). Set the switch to 1 and reboot the system.

In the second sample output, the user enters the **prcache -f** command during the 10-minute initial charge period. The battery status is reported as "not available" (②) because the module is still charging.

After the 10-minute initial charge period (and before booting the operating system), the user enters the **prcache -f** command. The third sample output reports that the battery status is "OK-charging" (③).

*CAUTION: The MS7BB batteries may fail during the 16-hour charge-up period even though initial power-up data reports that the batteries are okay and charging. It is recommended that you enter the DEC OSF/1 **presto -p** command during and after the 16-hour charge-up period to ensure that the batteries are fully charged. See Section 3.4 for more information on the **presto -p** command.*

Example 3-2 Prcache Command Sample Output (Continued)

4.

```
>>> prcache -f
NVRAM Test Status: passed
Size: 16MB
Base Address: 04000000
System ID: CHIC01
State: dirty ⑤
Battery Status: OK-charging
Battery Disconnect Status: battery enabled
Battery Replacement Date:

>>> prcache -z ⑥
NVRAM is Dirty. Do you wish to initialize [Y/(N)]? y
>>>
>>> prcache -f
NVRAM Test Status: passed
Size: 16MB
Base Address: 04000000
System ID: CHIC01
State: not in use ⑦
Battery Status: OK-charging
Battery Disconnect Status: battery enabled
Battery Replacement Date:
```

5.

```
>>> prcache -b                # Enter this command to set the
                             # first battery replacement date.
Next battery replacement date (mmm-yyyy)? oct-1995

>>> prcache -f
NVRAM Test Status: passed
Size: 16MB
Base Address: 04000000
System ID: CHIC01
State: not in use
Battery Status: OK-fully charged
Battery Disconnect Status: battery enabled
Battery Replacement Date: oct-1995 ⑧
>>>
```

In the fourth sample output of the **prcache -f** command, the state of the module is reported as "dirty" (❸), which means that there is stored data on the module. To clear the data from the module, you enter the **prcache -z** command (❹). Then type "y" in response to the system query. Now reenter the **prcache -f** command. The state of the module is reported as "not in use" (❺) indicating that the data has been cleared.

The user enters **prcache -b** to record the first battery replacement date in the fifth sample output. The battery replacement date is then displayed on the last line of output when the user enters **prcache -f** (❻).

NOTE: The battery pack must be replaced every two years. Be sure to enter the new battery replacement date after installing the battery pack.

3.3.2 Test Command

In console mode, enter the test command to run the memory exerciser on the MS7BB module. Example 3-3 shows sample outputs. After entering the test command, the user receives a console message if the MS7BB module is storing valid data.

Example 3-3 Test Command Sample Output

1.

```
>>> test ms7bb0          # After the user enters the test command,
                        # a message indicates that the MS7BB module
                        # contains valid data.

Memory subsystem test selected for runtime of 120 seconds
Type Ctrl/C to abort...
The MS7BB in your system is dirty; i.e. it contains valid user data.
Are you sure you wish to test this module? [Y/(N)] y
Starting memory exerciser, running on kn7aa0 (id #b6)
Still testing...
Still testing...
Still testing...
Still testing...
Stopping memory exerciser, running on kn7aa0 (id #b6)
Done testing...
>>>
```

2.

```
>>> test ms7bb0          # The user enters the command; no valid
                        # data is found on the MS7BB module, so
                        # testing begins immediately. The memory
                        # exerciser runs for two minutes.

Memory subsystem test selected for runtime of 120 seconds
Type Ctrl/C to abort...
Starting memory exerciser, running on kn7aa0 (id #b0)
Still testing...
Still testing...
Still testing...
Still testing...
Stopping memory exerciser, running on kn7aa0 (id #b0)
Done testing...
>>>
```

NOTE: You must type either "Y" or "y" in response to "Are you sure you wish to test this module?" Otherwise, testing will be aborted as shown in the following sample output.

```
>>> test ms7bb0
Memory subsystem test selected for runtime of 120 seconds
Type Ctrl/C to abort...
The MS7BB in your system is dirty; i.e. it contains valid user data.
Are you sure you wish to test this module? [Y/(N)]
Aborting further testing...
Done testing...
>>>
```

3.4 DEC OSF/1 Presto Command

When the DEC OSF/1 operating system is running, you can issue the command `presto -p` to check the battery status. Example 3-4 shows sample output of the `presto -p` command.

Example 3-4 Presto -P Command Sample Output

1.

```
# presto -p                # User enters command during 10-minute initial
                           # charge period.
dirty = 0, clean = 0, inval = 2022, active = 0
      count  hit rate  clean hits  dirty hits  allocations      passes
write:      0      100%         0         0         0         0
 read:      0      100%         0         0         0         0
total:      0      100%         0         0         0         0
state = ERROR, size = 0xffffc00 bytes
statistics interval: 00:00:00 (0 seconds)
write cache efficiency: 0%
battery 1 is in self-test! ❶
#
```

2.

```
# presto -p                # User enters command after 10-minute initial
                           # charge and before 16-hour charge period expires.
dirty = 0, clean = 0, inval = 2022, active = 0
      count  hit rate  clean hits  dirty hits  allocations      passes
write:      0      100%         0         0         0         0
 read:      0      100%         0         0         0         0
total:      0      100%         0         0         0         0
state = ERROR, size = 0xffffc00 bytes
statistics interval: 00:00:00 (0 seconds)
write cache efficiency: 0%
battery 1 is charging! ❶
#
```

3.

```
# presto -p                # User enters command after 16-hour charge period.
dirty = 0, clean = 0, inval = 2022, active = 0
      count  hit rate  clean hits  dirty hits  allocations      passes
write:      0      100%         0         0         0         0
 read:      0      100%         0         0         0         0
total:      0      100%         0         0         0         0
state = UP, size = 0xffffc00 bytes
statistics interval: 00:00:03 (3 seconds)
write cache efficiency: 0%
All batteries are ok ❶
#
```

When you issue the DEC OSF/1 command **presto -p**, the battery status is reported on the last line of the output (see ❶ in Example 3-4).

The first sample output shows that the operating system has been booted during the MS7BB 10-minute initial charge period indicated by the message: battery 1 is in self-test!

The 10-minute initial charge period has completed in the second sample output, however the battery backup service is not in effect because the 16-hour charge-up period has not passed.

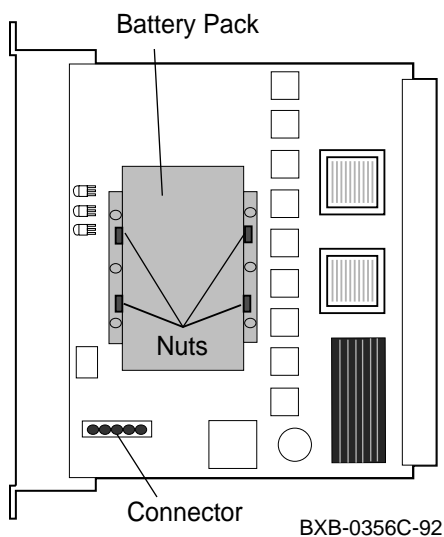
In the third sample output, the batteries are fully charged and battery backup service is in effect.

NOTE: The state of the module is reported as "ERROR" during each 16-hour charge-up period. This is normal. Following a 16-hour charge-up period, the state is reported as "UP."

3.5 Battery Pack Removal and Replacement

As a maintenance procedure, the MS7BB battery pack must be replaced every two years. First, remove the module from the card cage (see Section 3.6). Then use the following procedures to remove and replace the battery pack.

Figure 3-6 MS7BB Battery Pack



CAUTION: You must wear a wrist strap when you handle any modules.

1. Locate the MS7BB switch. Set the switch to 0.
2. Remove the cover that shields the battery side of the module by removing the eight small Phillips screws. (You can see the battery pack through the open side of the module.)
3. Disconnect the battery cable connector by pushing in the connector tabs and pulling up the connector until it is released from the receptacle.

4. Using a 7mm wrench or a small crescent wrench, loosen the four nuts that secure the battery pack housing (see Figure 3-6). Slide back the removable section of the housing until you are able to remove it.
5. Remove the battery pack by sliding it out of the housing. Gently glide the cable connector and wires through the housing opening when removing the battery pack.

NOTE: To install a new battery pack, follow the removal steps in reverse.

MS7BB Module Verification

1. Install the MS7BB module in the LSB card cage (see Section 3.2).
2. Power up the system and check the status of the module (see Section 3.2).
3. Use the commands described in Sections 3.3 and 3.4 to check battery status reports and to test the module.
4. In console mode, enter **prcache -b** to record the next battery replacement date. You can check the new battery replacement date by entering the command **prcache -f**.

```
>>> prcache -b
Next battery replacement date (mmm-yyyy)? oct-1995
>>> prcache -f
NVRAM Test Status: passed
Size: 16MB
Base Address: 04000000
System ID: CHIC01
State: not in use
Battery Status: OK-fully charged
Battery Disconnect Status: battery enabled
Battery Replacement Date: oct-1995
```

3.6 Removing the MS7BB Module

Use the procedure in this section to remove the MS7BB module from the LSB card cage.

1. Perform steps 1 through 5 in the module installation procedure (see Section 3.2).

*NOTE: Perform step 2 only if you do **not** intend to maintain saved data on the module or if the module will not be in operation for 48 hours or more.*

2. Set the MS7BB switch to 0.
3. Pull out the two black restraining clips on the MS7BB module.
4. Holding the levers, pull on the module until it is out far enough to hold it underneath as you remove it.
5. Place the module on an ESD pad in a safe area.
6. Install a filler module in the empty slot and replace the LSB card cage plate.
7. Close the cabinet door.

Appendix A

Hot Wiring the MS7BB Battery Status

This appendix describes how to "hot wire" the DEC OSF/1 kernel to avoid waiting for the MS7BB battery 16-hour charge-up period to expire.

*CAUTION: **You must reboot the system to reenale battery status checks.** If you do not reboot the system, the customer could run Prestoserve with real data before the battery is ready to be used. This could result in catastrophic data loss if power is lost during the 16-hour charge-up period.*

Example A-1 shows how to hot wire the DEC OSF/1 kernel so that you can test the MS7BB module without waiting for the 16-hour charge-up period to expire.

Example A-1 Hot Wiring the MS7BB Battery Status

```
# presto -p ❶
dirty = 0, clean = 0, inval = 2022, active = 0
      count  hit rate  clean hits  dirty hits  allocations      passes
write:   0      100%         0           0           0           0
read:    0      100%         0           0           0           0
total:   0      100%         0           0           0           0
state = ERROR, size = 0xffffc00 bytes
statistics interval: 00:00:00 (0 seconds)
write cache efficiency: 0%
battery 1 is charging! ❷
# dbx -k /vmunix ❸
dbx version 3.11.1
Type 'help' for help.

warning: Files compiled -g3: parameter values probably wrong
stopped at [thread_block:1414 ,0xfffffc00002c58d0] Source not available
(dbx) assign pr_callbatts=1 ❹
1
(dbx) quit ❺
# presto -p ❻
presto: primary battery ok
presto: secondary battery ok
presto: 2nd secondary battery ok
dirty = 0, clean = 0, inval = 2022, active = 0
      count  hit rate  clean hits  dirty hits  allocations      passes
write:   0      100%         0           0           0           0
read:    0      100%         0           0           0           0
total:   0      100%         0           0           0           0
state = DOWN, size = 0xffffc00 bytes
statistics interval: 00:00:00 (0 seconds)
write cache efficiency: 0%
All batteries are ok ❼
#
```

- ❶ At the system prompt, enter the command **presto -p** to obtain a battery status report.
- ❷ The battery status reports: battery 1 is charging!
- ❸ Enter this command to access the debugger program.
- ❹ At the (dbx) prompt, enter this command. When the command is executed, the Prestoserve code is disabled from checking the battery status until you reboot the system.
- ❺ Enter this command to exit from the debugger program.
- ❻ At the system prompt, enter **presto -p**.
- ❼ Note that the battery status report has now changed to: All batteries are ok. You can now proceed with additional testing.

*CAUTION: **You must reboot the system to reenale battery status checks.** If you do not reboot the system, the customer could run Prestoserve with real data before the battery is ready to be used. This could result in catastrophic data loss if power is lost during the 16-hour charge-up period. Refer to the Guide to Prestoserve (order number AA-PQT0A-TE) for information on how to accelerate a file system. Accelerating a file system ensures that the MS7BB module and the PAK have been properly installed, and that the kernel is properly reconfigured.*