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AM-447 RAID Subsystem Installation Instructions

The AM-447 is an UltraWide SCSI RAID (Redundant Array of Independent Disks) subsystem. As provided by Alpha Micro, the AM-447 consists of up to six 9GB or 18GB SCSI disk drives and a RAID controller, all contained in a single enclosure. The AM-447 includes management and monitoring software that you can access through a serial connection and character-based interface.

The AM-447 is supported only under AMOS 2.X and must be attached to a wide SCSI bus port. It is not supported under 1.X versions of the operating system, nor is it supported in a narrow SCSI bus configuration!

For topics not covered in this document, such as switching drives inside the RAID cabinet, please refer to the Fortra Installation Guide, included with the AM-447.

INSTALLATION OVERVIEW

Whether it's provided as part of a complete computer system or shipped independently, the AM-447 is fully configured before it leaves the factory. Therefore, the installation procedure at your site is very straightforward:

1. Attach the AM-447 to the computer's wide SCSI bus.
2. If so desired, access the built-in RAID configuration and management software via a serial connection between your host computer and the AM-447.
3. If so desired, enable the AMOS RAID monitoring program, RADMON.

The following sections discuss these steps in more detail.

ATTACHING THE SCSI CABLE

To attach the AM-447 to your computer's SCSI bus, first make sure power is off to both your computer and the AM-447. Remove the external terminator from the computer chassis and plug in an external SCSI cable, provided with your AM-447. Attach the other end of the cable to the HOST I/O IN port on the AM-447. Attach an external terminator to the HOST I/O OUT port on the AM-447. See the next page for more about SCSI termination.

The AM-447 is an UltraWide SCSI device; its SCSI port accepts only a 68-pin Wide SCSI connector. Make sure you use the wide SCSI cable that was included with your AM-447 RAID subsystem.

If you need to attach an external narrow SCSI device to your host system in addition to the AM-447 RAID subsystem, you should attach the narrow SCSI device beyond the AM-447, with proper termination of the high nine lines of the Wide SCSI-2 bus where the cable changes from wide to narrow

using a special SCSI cable (PRF-00297-82). Make sure to terminate the remaining lines at the end of the bus using a proper active SCSI terminator. See the next section.

Whatever the external SCSI bus configuration, care must be taken to insure that the overall SCSI bus length specification, including the internal host SCSI bus, is not exceeded. Consult the "*Wide SCSI Configurator*" contained in Marketing Bulletin AMB98-04 for limitations and recommendations.

SCSI Termination

For your convenience, we disable the internal SCSI terminators in the AM-447 before it leaves the factory. Just plug an external active Wide SCSI terminator into the HOST I/O OUT port on the back of the AM-447. Use the SCSI terminator that was plugged into the external SCSI bus connector on your host computer prior to installing the external SCSI cable.

To connect another SCSI device beyond the AM-447, remove the terminator at the HOST I/O OUT connector on the AM-447 rear panel and plug another SCSI cable into HOST I/O OUT connector. If the additional device is a Wide SCSI device, make sure to terminate the bus after that device. Usually, this just means moving the external terminator to the new device. If the additional device is a narrow SCSI device, you should use a cable terminating the high nine lines of the bus (such as PRF-00297-82) at the AM-447, and a narrow active terminator (PRA-00222-21) attached to the additional device to terminate the remaining lines.

Setting the SCSI ID

The AM-447 comes with its SCSI ID already set according to your configuration request. Usually, the AM-447 is configured as a bootable device set to SCSI ID 0. If you need to change the AM-447 SCSI ID for any reason, you can do so by attaching a PC or terminal to the serial port on the rear panel of the AM-447, and access the *Setup Parameters* screen in the Monitor Utility MAIN MENU. See the SCSI RAID Controller Manual for details.

To boot from the AM-447, you must set your computer's boot ID correctly using the CMOS configuration menu.

ENABLING THE MANAGEMENT SOFTWARE

The AM-447 includes powerful management and monitoring software that lets you perform functions such as changing the SCSI ID of the subsystem, as well as checking the status of the subsystem and the individual drives at any time. Connect a PC, host system serial port, or ASCII terminal to the serial port on the AM-447 back panel to access this built-in software. This software is described in detail in the SCSI RAID Controller Manual.

The following sections discuss compatibility issues, then explain how to connect to the AM-447 so you can use the software.

Terminal Compatibility

To use all the features of the management and monitoring software, the device you're attaching to the AM-447 serial port must be capable of VT-100 emulation. If you are connecting from an Alpha Micro computer, it must have a communications package, such as VersiCOMM Plus, which supports VT-100 emulation. If you are using a PC, Windows 95 and many other operating systems support VT-100 emulation. You can also use an ASCII terminal attached directly to the AM-447's serial port, provided it has a VT-100 emulation capability.

Connecting Through the Serial Port

The AM-447 serial port is a DB-9 male connector. With the AM-447 subsystem, Alpha Micro Products includes all the necessary cables and connectors for you to connect from this port to any of the following:

- An AM-359-style RJ-45 connector.
- An AM-355-style DB-9 connector.
- A DB-9 serial port on a PC.
- A DB-25 connector directly to a terminal.

If you are monitoring the AM-447 from an AMOS system, that system can be, but does not have to be, the host system. That is, you can use the AM-447 as a disk drive on one AMOS computer, and attach its monitoring port to a different AMOS computer.

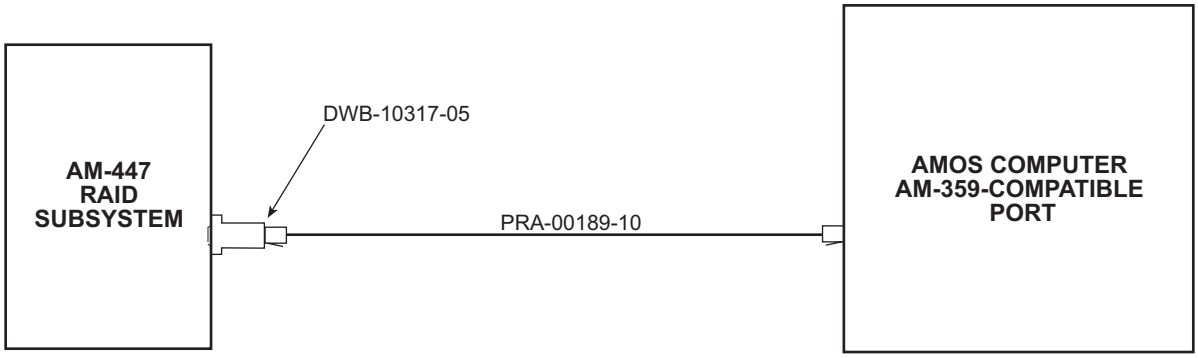
For all of these connections, first plug the DB-9 to RJ-45 adapter, DWB-10317-05, into the serial port on the AM-447, and attach the provided RJ-45 cable, PRA-00189-10, to it. Then continue as shown below:

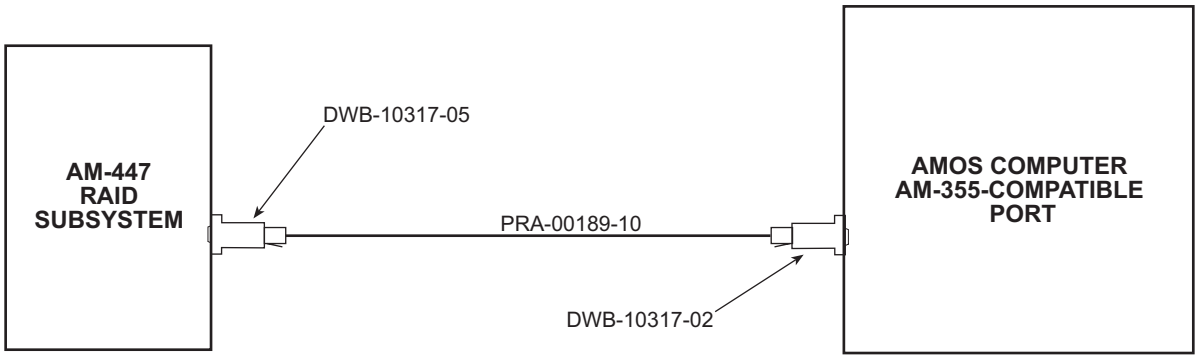
- **To connect to an AM-359-style port:** Plug the other end of the RJ-45 cable into the desired AM-359-compatible port.
- **To connect to an AM-355-style port:** Attach an RJ-45 to DB-9 male adapter, DWB-10317-02, to the other end of the RJ-45 cable. Plug the DB-9 side of the connector into an AM-355-compatible port.
- **To connect to a PC serial port:** Attach an RJ-45 to DB-9 female adapter, DWB-10317-25, to the other end of the RJ-45 cable. Plug the DB-9 side of the connector into a serial port on the PC.
- **To connect directly to a terminal:** Attach an RJ-45 to DB-25 male adapter, PRA-00188-31, to the other end of the RJ-45 cable. Plug the DB-25 connector into the terminal.

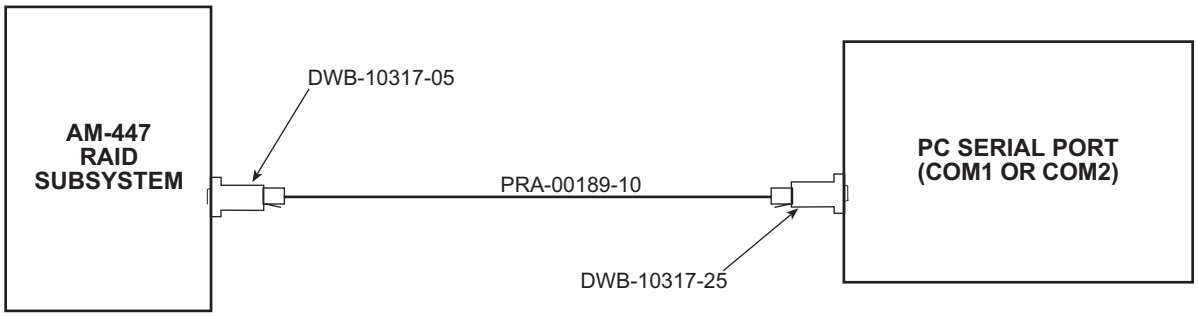
Once the AM-447 is connected to the computer or terminal you will use for management and monitoring, use a VT-100-capable communications program to access the management software. Use the following serial port communications settings:

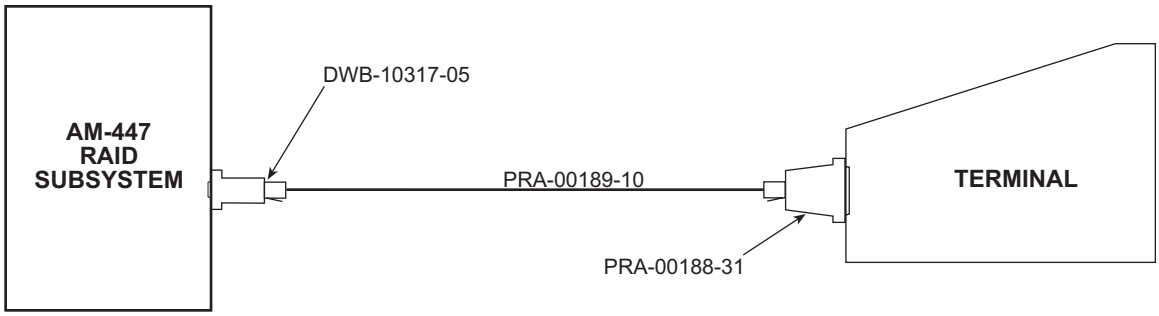
- Baud Rate: 9600
- Data: 8 bits
- Parity: None
- Flow Control: Xon/Xoff

The following illustration shows each type of connection:


AM-447
RAID
SUBSYSTEM
DWB-10317-05
PRA-00189-10
AMOS COMPUTER
AM-359-COMPATIBLE
PORT


AM-447
RAID
SUBSYSTEM
DWB-10317-05
PRA-00189-10
DWB-10317-02
AMOS COMPUTER
AM-355-COMPATIBLE
PORT


AM-447
RAID
SUBSYSTEM
DWB-10317-05
PRA-00189-10
DWB-10317-25
PC SERIAL PORT
(COM1 OR COM2)


AM-447
RAID
SUBSYSTEM
DWB-10317-05
PRA-00189-10
PRA-00188-31
TERMINAL

MONITORING THROUGH AMOS—THE RADMON UTILITY

AMOS includes a software utility, RADMON, to monitor the status of the RAID disk drives and report any failures to the system operator's terminal and, optionally, via e-mail messages. You can set this program to run automatically on a background job by modifying your system initialization command file.

What RADMON Does

Once a minute, RADMON checks the AM-447's internally maintained log file to see if any reported events warrant user notification (which events qualify depends on the switches used when you start RADMON, as described later). If it finds any, it sends a message to the system operator's terminal and to any e-mail address(es) you've specified. If the error is not corrected, RADMON repeats the message to the system operator terminal once an hour, and repeats the e-mail message every 24 hours. If another qualifying event is detected, it sends another message immediately.

RADMON Requirements

RADMON works only on AMOS computers that use the SCSI dispatcher. If you want RADMON to send notification messages via e-mail, there are additional requirements:

- Your computer must run AMOS 2.2C or later.
- Your e-mail package must use an e-mail driver.
- SNDMAL.LIT and LODEMD.LIT must be in the SYS: account.

Setting Up RADMON

See the RADMON Command Reference Sheet, attached to the end of this document.

AM-447 RAID SUBSYSTEM INDICATORS AND ALARMS

Front Panel Status Indicators

Each disk drive canister contains status indicators on the front panel. A Blue light indicates disk drive activity. A Red light indicates a device fault. If all disk drive canisters display a Red light that is blinking on and off, a blower or power supply fault has occurred. If the lights are violet or alternating colors, the RAID is working during a fault alert.

Each power supply canister also contains a status indicator. A Blue light indicates the power supply is functioning properly. A fault in the power supply will result in a blinking Red light.

Audible Alarm

The AM-447 contains an audible alarm as well as the status lights mentioned above. This alarm is used to indicate thermal problems within the subsystem, or if a power supply or disk drive is removed from the subsystem while power is ON and the subsystem is connected to the host. To turn the alarm off, either of the following procedures can be used:

- From the terminal keyboard attached to the serial port on the rear of the AM-447, depress CNTRL X.
- From the RAID front panel, select TESTS, then ALARM TESTS, and cycle the alarm test function.

RADMON

FUNCTION

Monitors status of AM-445, AM-446, and AM-447 RAID controller. Sends notification messages if a fault occurs.

CHARACTERISTICS

RADMON runs on a background job and checks the RAID controller for error conditions once a minute. If it finds one, it sends messages to the system operator's terminal and, optionally, to one or more email addresses. It is used only in the system initialization command file.

FORMAT

```
RADMON {/ID=id} {/EMAIL=address{,address}}{/option(s)}
```

id is the SCSI ID of the RAID controller. If you leave it out, RADMON polls the SCSI bus until it finds the controller.

Each ***address*** is an email address to send notification messages to. It must be in standard Internet mail format: *name@system*.

OPTIONS

/O	With AM-446 and AM-447, displays event types other than those normally displayed.
/R	With AM-446 and AM-447, displays messages for all event types.
/S	Suppresses the email message sent when the program starts.
/Z	Monitor events from the beginning of the RAID log file. Otherwise, when RADMON restarts, it begins checking events from the point where it left off.

The /O, /R, and /Z switches are generally used only when a problem is suspected or known and you need more diagnostic information. They work only with the AM-446 and AM-447 subsystems, not the earlier AM-445 RAID Controller.

OPERATION

RADMON runs on a background job attached to a pseudo-terminal. There is no reason to run it on a real terminal unless debugging a RADMON installation, since it sends all important messages to the system operator’s terminal. Follow the steps below to set up RADMON. If you want more information about any part of the initialization file, see the *System Operator’s Guide to the System Initialization Command File.*

1. If you want to use e-mail notification, you must have AlphaMAIL and AlphaTCP's SMTPD installed, and be able to send mail from AlphaMAIL to the intended Internet mail user.
2. Run MUSER and add a user name to uniquely identify the RADMON job on this computer. This will be the FROM name on any mail message RADMON sends.
3. Allocate a mailbox for the user name you've just created. Refer to your mail package documentation for instructions. Log in as that user and send mail to the intended Internet mail user.
4. Log to the SYS: account, then create a test copy of your initialization file:

   ```
   COPY TEST.INI=AMOS32.INI RETURN
   ```

   Then VUE the test file.
5. Add one to the number of jobs in the JOBS statement.
6. Add a JOBALC statement defining a job called RADMON.
7. Add a TRMDEF statement for a pseudo-terminal called RADMON. For example:

   ```
   TRMDEF RADMON,PSEUDO,NULL,80,80,80
   ```
8. Add a SETJOB command to attach the RADMON job to the RADMON pseudo-terminal:

   ```
   SETJOB RADMON,RADMON,70K,RADMON.JIN
   ```
9. If you want RADMON to send e-mail notification, make sure the e-mail driver program is loaded into memory somewhere before the first SYSTEM statement. This statement must also be before the SETJOB statement for the RADMON job.
10. Finish from the test initialization file.
11. In SYS:, create a file called RADMON.JIN containing these statements:

    ```
    :T
          LOG user-name
          RADMON {/ID=id}
    {/EMAIL=address{,address}}{/option(s)}
    ```

    user-name is the RADMON name you set up in step 2. If you aren't using e-mail notification, it can be any user name.

    id is the SCSI ID of the RAID controller. If you don't include the SCSI ID, RADMON will poll the SCSI bus until it finds the controller.

    Each optional ***address*** is an e-mail address you want RADMON to send notification messages to. Each one must be in standard Internet address format: person@system.
12. Make sure no one else is using the computer and use MONTST to test your new initialization file.

If everything is correct, STAT should show the RADMON job in an Sl (sleep) state. If you set up e-mail notification, a message is sent to the specified addresses telling them that RADMON is running, unless you also used the /S switch.

If there is a problem, change the SETJOB statement to attach RADMON to a real terminal and MONTST again. Check the terminal for error messages so you can correct the situation.

Once you're satisfied everything is working correctly, rename your test initialization file to make it your standard initialization file.

MESSAGES

?Micropolis RAID controller not found

Either you entered an incorrect value for the SCSI ID, or you did not enter a SCSI ID and RADMON could not find the controller when it polled the SCSI bus.

No supported RAID controller found

Either you entered an incorrect value for the SCSI ID, or you did not enter a SCSI ID and RADMON could not find the controller when it polled the SCSI bus.

RADMON - Error communicating with RAID controller

RADMON did not understand the responses it received when it polled the RAID controller.

?This program requires a SCSI dispatcher be installed

You cannot use RADMON if your computer doesn't use a SCSI dispatcher.

Usage: RADMON [/ID=x] [/email=person@system[,person@system] /S] [/R/Z/O]

The syntax of your RADMON command line in RADMON.JIN is not correct. Check the format and reboot your computer.