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Roadrunner
030/040 Eagle Upgrade
Installation Instructions

PDI-03500-00, Rev. B01

FIRST EDITION: July 1998

To re-order this document, request part number PDI-03500-00.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de Conformité aux Normes du Ministère des Communications du Canada

Cet équipment ne deapsse pas les limits de Classe A d'émission de bruits radioélectriques pour les appareils numeriques tels que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milleu résidential peut entrainer le brouillage des réceptions radio et tele, ce qui obligerait le propriétaire ou l'opératour à pendre les dispositions nécessaires pour en éliminer les causes.

Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
ATTENTION: Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

For AM-3500-E100, -E200, -E300, -E400, -E500 and AM-990-01 systems replace battery with Panasonic or Ray-O-Vac BR2325 only. For AM-3500-E550, AM-3500-6000, and AM-990-04 systems, replace batteries with Panasonic or Ray-O-Vac BR1225 only. Use of other batteries may present a risk of fire or explosion. Replacement batteries may be ordered from your authorized Alpha Micro reseller.

Safety Warning

This computer contains no user-configurable components that require opening the computer case. Because the power supply in this computer is capable of outputting high current levels hazardous to your safety, the computer case should only be opened by an authorized service technician.

Cet ordinateur ne contient aucune pièce configurable par l'utilisateur qui nécessite l'ouverture du boitier. L'alimentation de cet ordinateur peut preduire des nivaeux de tensions dangereux, le boitier ne devrait donc être ouvert que par un technician autoriaé.

SOFTWARE SECURITY DEVICE IDENTIFICATION NUMBER: _____

The Alpha Micro Software Security Device (SSD) is a customized integrated circuit that personalizes the computer, providing identity verification for it. Certain Alpha Micro and non-Alpha Micro software may require that your computer contain an SSD in order to run software that has been customized to run only on your computer.

Please enter the identification of your SSD above. The SSD identification number should be on your computer ID label under "SSD Serial No." (Another way of finding the number is to look at the SSD itself. The SSD is located in an integrated circuit location on the CPU board; its identification number is printed on the SSD itself.) Software vendors may ask you for the SSD number if they are customizing software to run only on your computer.

This document may contain references to products covered under the following U.S. Patent Number(s): 4,530,048

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INTRODUCTION

This document is designed for those who are purchasing a minimum configuration Eagle computer upgrade in which they will be installing a Roadrunner board and peripherals from an existing computer—e.g., AM-2000M, AM-1600, AM-1200, etc. The instructions in this document assume your existing Roadrunner-enhanced computer is fully functional.

Eagle 550 systems are NOT supported for use with Roadrunner "030" boards.

The following topics are discussed:

- Software configuration.
- Making a warm boot tape.
- Making your software Eagle compatible.
- Making a warm boot tape for your Eagle computer
- SSD and boot PROM information.
- Installation of various serial I/O board types.
- Roadrunner board installation.

In addition to this document, there are a number of other documents that will provide you with information for configuring your Eagle computer:

- *Eagle Series Computer Owner's Manual* (supplied with your Eagle computer upgrade.)
- *Eagle Computer Service Manual* (supplied with your Eagle computer upgrade.)
- *Eagle/Roadrunner Configuration Information* (included with your Eagle computer documentation package.)
- *AM-314 Four-Port Serial I/O Board Installation Instructions*
- *AM-318 Eight-Port Serial I/O Board Installation Instructions*
- *AM-318-10 Eight-Port Serial I/O Board Installation Instructions*
- *AM-359 Eight-Port Serial I/O Board Installation Instructions*

The serial ports on the AM-318, AM-318-10, and AM-359 can take advantage of a feature called Super I/O. Super I/O handles character output in a much more efficient manner than any previously released AMOS serial port driver, which greatly reduces the load on the CPU and makes more CPU cycles available for other tasks. See your *Eagle Series Computer Owner's Manual* or the installation instructions for the serial I/O board for more details.

SOFTWARE

The sections that follow contain instructions for modifying your system initialization command file and AMOS monitor. Before making these modifications, **make sure all your data has been saved on some type of backup media and make sure you have a bootable tape.**

Before you transfer the Roadrunner board and peripherals from your old computer into your new Eagle computer, you need to make sure your bootable SCSI drive is properly configured for the Eagle computer. To be Eagle-compatible, your AMOS operating system must be AMOS 1.4C or 2.2C release version PR8/94, or later. The latest versions of AMOS are available on the current AMOS CD-ROM.

Eagle 550 systems require AMOS 2.2C PR11/95 with an enhanced software package (PSK-04327-00) overlaid on it, or any AMOS 2.3 version. ***Eagle 550 systems do not support any AMOS 1.4x version.***

Downloading the Software

While your SCSI drive is still up and running in your old computer, perform the following steps:

1. Download the appropriate AMOS operating system release. Follow the instructions in the release notes shipped with the software.
2. Once the software has been downloaded, configure and test it (using the instructions in the next section) on your existing configuration first, before performing the Eagle upgrade.

Configuring the Software to Work in Your Old Configuration

Once the software has been downloaded, you must make sure it is working properly in your old computer.

The following instructions assume you'll be using the same (or a duplicate) SSD chip and already have the associated PIC codes. If you are upgrading with a new SSD chip you need to obtain new PIC codes from Alpha Micro or your Alpha Micro dealer. After installing the upgrade (with a new SSD chip) you can simply repeat the following dispatcher and monitor encodement steps, substituting the new PIC codes.

1. First, for AMOS 1.4x or 2.2C, enter the PIC for the SCSI dispatcher. ***You do not need to do this for AMOS 2.3x!*** In AMOS 2.3x, the dispatcher does not require a separate PIC code. Go to step 2.

   Once you enter the product installation code (PIC), the product overlay file is forever modified and will not accept a new PIC. This can be a problem if you happen to enter an incorrect PIC. As a safeguard, make a copy of the dispatcher overlay file before you do the SSD encodement. To do so, type:

   ```
   LOG SYS: RETURN
   COPY SCZDSP.SAV=SCZDSP.OVR RETURN
   ```

   Saving an unmodified version of the overlay file allows you to re-enter the PIC if necessary.

To perform the SSD encodement, enter the following command:

```
SCZPIC RETURN
```

You will be prompted for a Product Installation Code (PIC).

Enter the same PIC used when you originally installed your Roadrunner board. Enter the PIC carefully and press RETURN.

After a brief pause, you will be returned to AMOS command level and you can proceed with the remainder of the installation. If you see the error message `?Improper SSD` after you have rebooted the computer, it probably means you have entered the PIC incorrectly.

As mentioned above, you cannot PIC-encode the same overlay twice! To re-encode the dispatcher software, type this command first:

```
COPY SCZDSP.OVR=SCZDSP.SAV RETURN
```

You will now be able to re-encode the dispatcher. If you receive the same error, after rebooting the computer , check with your dealer to make sure you have the correct PIC for your computer.

2. Next, embed the Roadrunner SCSI driver into your AMOS monitor:

```
LOG SYS: RETURN
MONGEN RETURN
Input monitor name: AMOS.MON RETURN
New disk driver: SCZRR.DVR RETURN
New language definition table name:  RETURN
New monitor name: TEST.MON RETURN
SAVE TEST.MON RETURN
```

Testing the New Software

Now that you have entered the PIC for the SCSI dispatcher and created a monitor called TEST.MON, you need to verify the software boots in your old configuration. Type:

```
LOG OPR: RETURN
MONTST TEST,AMOS32.INI RETURN (or AMOSL.INI, depending on the configuration)
```

Watch your display screen as the system boots and make sure no errors are displayed as the initialization file is processed. If the system boots without error, type:

```
COPY AMOS32.MON=TEST.MON RETURN
```

or, if your computer uses a monitor called AMOSL.MON, type:

```
COPY AMOSL.MON=TEST.MON RETURN
```

Reboot the computer by pressing the reset button and do a complete check of all the hardware on your computer—printers, magnetic tape drives, etc.

Entering the AMOS PIC (AMOS 2.x Only!)

The AMOS 2.x monitor is PIC-encoded. The default monitor is configured for one user, and the PIC is tailored to the number of users you purchased.

At this point you are running under your new monitor, which is operating in single-user mode. To switch over to multi-user mode, you must run the OSINST program and enter the correct PIC code. Type:

```
LOG SYS: RETURN
OSINST RETURN
```

Enter the Product Installation Code (PIC) for the currently installed SSD chip. Once you confirm the PIC is correct, press RETURN. When you reboot the computer, it will come up in multi-user mode.

Making a Warm Boot Tape

Unless you have some other way of accessing your bootable drive, it would be a very good idea to make a warm boot tape before continuing with this procedure. After you generate the warm boot tape, ***make sure you test it***. Once you know the tape works, you will able to access your hard disk drive, should a problem arise.

MAKING YOUR SOFTWARE EAGLE COMPATIBLE

The steps outlined in this section will make your SCSI drive bootable when it is transferred into your new Eagle computer:

1. Your old computer may use AMOSL as the monitor and system initialization command file name—AMOSL.INI and AMOSL.MON. The Eagle computer requires these files to use the names AMOS32.INI and AMOS32.MON. To make your AMOSL.INI and AMOSL.MON files Eagle compatible, type:

   ```
   LOG SYS: RETURN
   COPY AMOS32.INI=AMOSL.INI RETURN
   COPY AMOS32.MON=AMOSL.MON RETURN
   ```

2. Eagle 300-500 computers use three types of I/O boards: the AM-314, which has four-ports, and the AM-318-00 and AM-318-10, which each have eight ports. The AM-314 uses the AM314.IDV serial port driver and the AM-318-00 uses AM318.IDV. The AM-318-10 uses two different drivers: A31810.IDV under AMOS 2.X, and 31810.IDV with AMOS 1.4X.

   Eagle 550 computers have four on-board RJ-45 serial I/O ports, and use the standard I/O paddle card interface. This allows AM-355 and AM-359 serial I/O paddle cards to be incorporated into the system. Since the four on-board serial ports incorporate the same operating characteristics as the AM-318-00 board, they use the same AM318.IDV driver. When connecting AM-355 or AM-359 paddle cards to the I/O expansion channels, you must use the correct driver for the channel being used. That is, if an AM-355 or AM-359 card is connected to the A-channel, use the AM355A.IDV or AM359.IDV driver. If the cards are connected to the B-channel, use the AM355B.IDV or AM359B.IDV driver.

The TRMDEF statements in the AMOS32.INI file must be updated with the serial port drivers corresponding to the configuration of your new Eagle computer. You can find instructions on how to make these modifications in the installation instructions for the serial I/O board.

3. If your new Eagle configuration will have more serial ports than your old computer has, you'll need to increase the queue block allocation. Use this formula to determine your new queue block requirement:

   ```
   NEW QUEUE BLOCK REQUIREMENT = OLD QUEUE BLOCKS + (13 x THE
   NUMBER OF JOBS)
   ```

   For example, if the QUEUE statement in your system initialization command file is currently set to 200 and the JOBS statement is increased to 50, the resulting formula would look like this:

   ```
   NEW QUEUE BLOCK REQUIREMENT = 200 + (13 x 50)
   ```

   and you would need to change the QUEUE statement to 850 queue blocks.

Making an Eagle-Compatible Warm Boot Tape

Before you shut down your old computer and remove your Roadrunner board, bootable SCSI drive, and other peripherals, you may want to make a warm boot tape that would be compatible with your new Eagle computer. This is especially important if you have no other convenient way of accessing your SCSI drive should it fail to boot after being installed in your Eagle computer.

An example of a typical routine for generating a warm boot monitor for an Eagle computer is shown below. The total size of your warm boot monitor cannot exceed 200KB. If you exceed the 200K limit, WRMGEN will generate an overflow error.

For all Eagle computers, when prompted for the system disk driver name and dispatcher name, enter SCZRR.DVR and SIMRR.SYS, as shown. However, the input monitor name, the bitmap size, the number of logicals, and other configuration-specific entries used below are examples only; you must enter the monitor name, bitmap size, number of logicals, etc. for your configuration.

```
LOG SYS: RETURN
WRMGEN RETURN

Warm Boot Monitor Generator X.X(XXX)

Input monitor: AMOS32.MON RETURN

System disk driver: SCZRR.DVR RETURN
       Number of logical units: 10 RETURN
       Bitmap size: 3969 RETURN

Language definition table name: RETURN   ;Pressing RETURN defaults to English

SCSI dispatcher (RETURN if none): SIMRR.SYS RETURN

System terminal interface driver: AM318.IDV RETURN
       System terminal interface port number: 0 RETURN
       System terminal interface baud rate: 19200 RETURN
       System terminal driver: AM62A.TDV RETURN
```

```
Enter name of SECONDARY DEVICE(s) to be defined into system,
 one per line. Enter blank to terminate loading.
       Device to define: /STR0 RETURN
       Device to define: TRM RETURN
       Device to define:  RETURN

Enter name of program(s) to be preloaded into SYSTEM MEMORY,
 one per line. Enter blank to terminate loading.
       Program to load: SYSMSG.USA RETURN
       Program to load: STR.DVR[1,6] RETURN
       Program to load: CMDLIN.SYS RETURN
       Program to load: SCNWLD.SYS RETURN
       Program to load:  RETURN

Enter name of program(s) to be preloaded into USER PARTITION,
 one per line. Enter blank to terminate loading.
       Program to load: LOG.LIT RETURN
       Program to load: DIR.LIT RETURN
       Program to load: COPY.LIT RETURN
       Program to load: DUMP.LIT RETURN
       Program to load: MTURES.LIT RETURN
       Program to load: MTUDIR.LIT RETURN
       Program to load: FMTSCZ.LIT RETURN
       Program to load: FMTSCZ.OVR RETURN
       Program to load: DSKANA.LIT RETURN
       Program to load: DSKDDT.LIT RETURN
       Program to load: SYSACT.LIT RETURN
       Program to load:  RETURN     ;after you enter this return, your AMOS32.WRM file is created.
```

In the example above, AM318.IDV is the system terminal interface driver. If your Eagle computer boots on an AM-314 or AM-318-10 board, be sure to enter the correct interface driver name.

Now you can generate a warm boot tape using the CRT620/B command.

HARDWARE INSTALLATION

The following sections describe the process of transferring your Roadrunner board and peripherals from your old computer into your new Eagle computer.

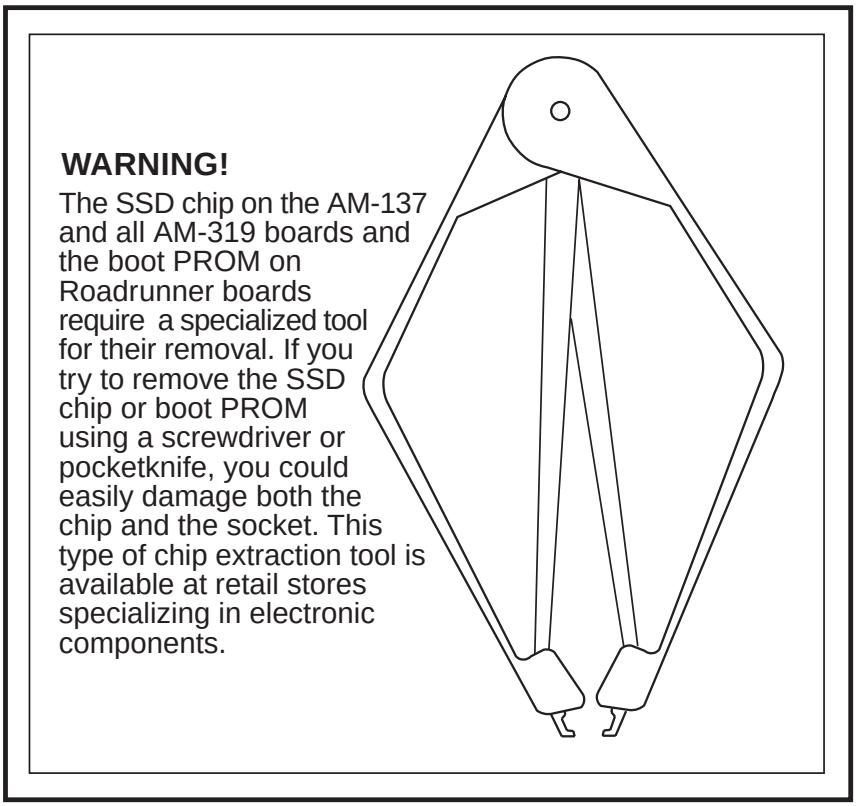
Updating the Roadrunner AM-172 or AM-174 Boot PROM

Your Eagle upgrade kit includes two Roadrunner boot PROM kits:

- The PDB-00172-90 kit contains a new boot PROM that will make your Roadrunner AM-172 board compatible with the Eagle computer.
- The PDB-00174-90 kit contains a new boot PROM that will make your Roadrunner AM-174 board compatible with the Eagle computer.

Make sure you install the new boot PROM included with your upgrade kit; your old boot PROM may not be compatible with the Eagle's AM-319(-00) or AM-319(-20) board.

The type of socket used for the boot PROM on your Roadrunner board requires a specialized removal tool. See the illustration below for more information:



Roadrunner Boot PROM Removal

AM-319 Board SSD Installation

Instructions for removing the Eagle computer top cover are included in the *Eagle Computer Service Manual*.

Since you cannot install the SSD chip from the old computer into the new Eagle computer, your Eagle upgrade order most likely includes a duplicate SSD chip. The SSD chip installs at location U6 on the AM-319(-00) board or at location U73 on the AM-319(-20). If the SSD chip is not installed when you receive your Eagle upgrade, you need to install the SSD chip into the socket. Before installing the chip, make sure there is absolutely no foam residue stuck to the pins. Referring to the AM-319 board illustration in the *Eagle Computer Service Manual*, press the SSD chip firmly and evenly into the socket. Make sure pin-1 on the SSD chip aligns with pin-1 on the socket as shown in the AM-319 illustrations.

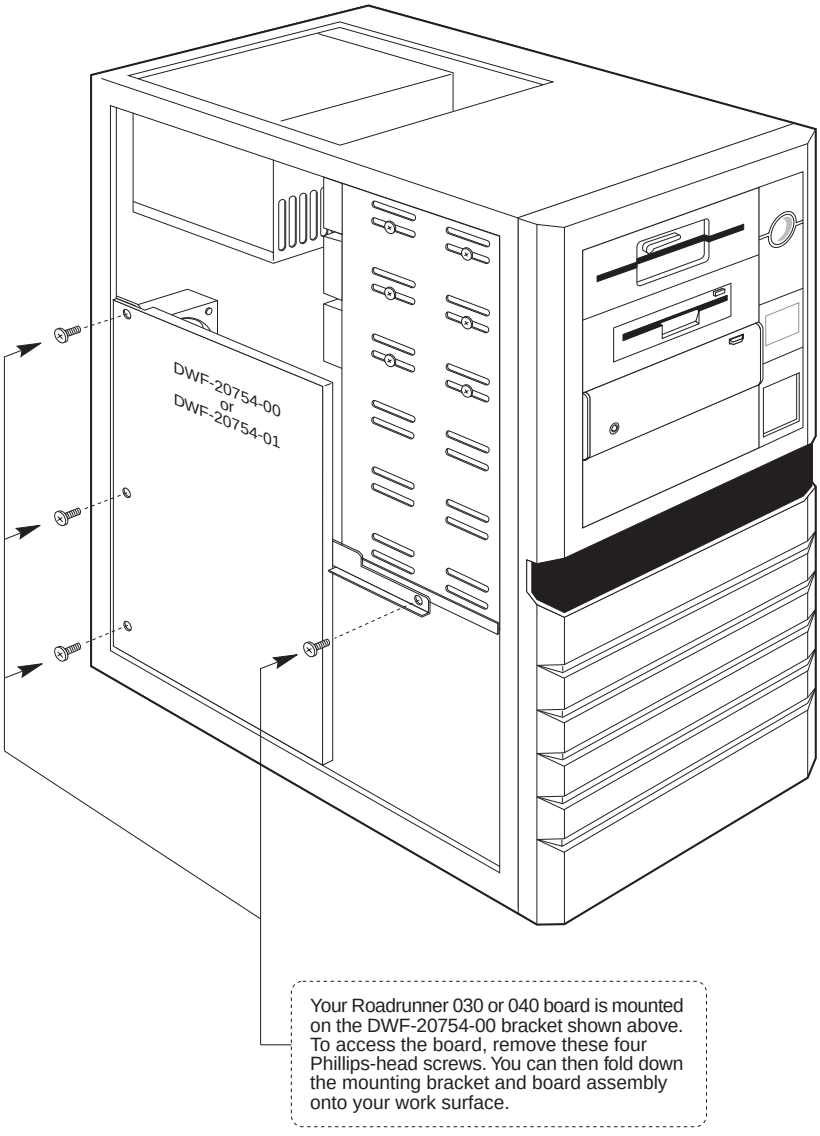
Just like the Roadrunner's boot PROM discussed in the previous section, the Eagle's SSD chip requires the same type of tool for its removal. Attempting to remove the SSD chip without the proper tool may damage both the SSD chip and the socket.

Installing Your I/O Boards

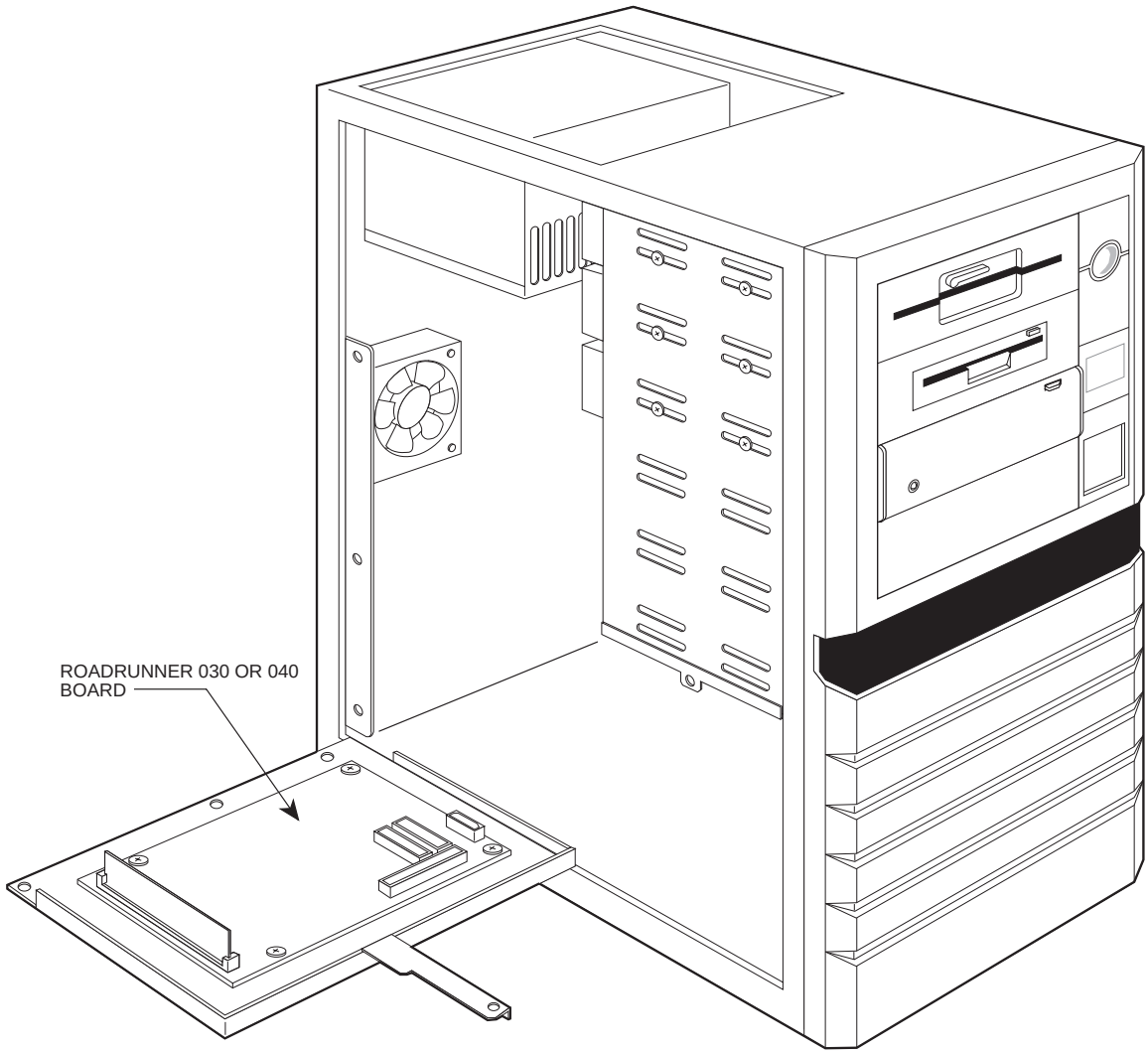
The Eagle computer may include different types of serial I/O boards, depending on the particular model. Consult the appropriate installation instructions for the serial I/O board.

Installing Your Roadrunner Board

In some Eagle computers, the Roadrunner board is mounted vertically on a special bracket as shown in the next two illustrations. Other Eagle computers have their Roadrunner boards mounted horizontally on the chassis bottom, as shown in the third illustration. The screen on the bottom of the chassis has four threaded standoffs to the hold the Roadrunner board in place. The instructions in the illustrations show how the Roadrunner board is held in place:

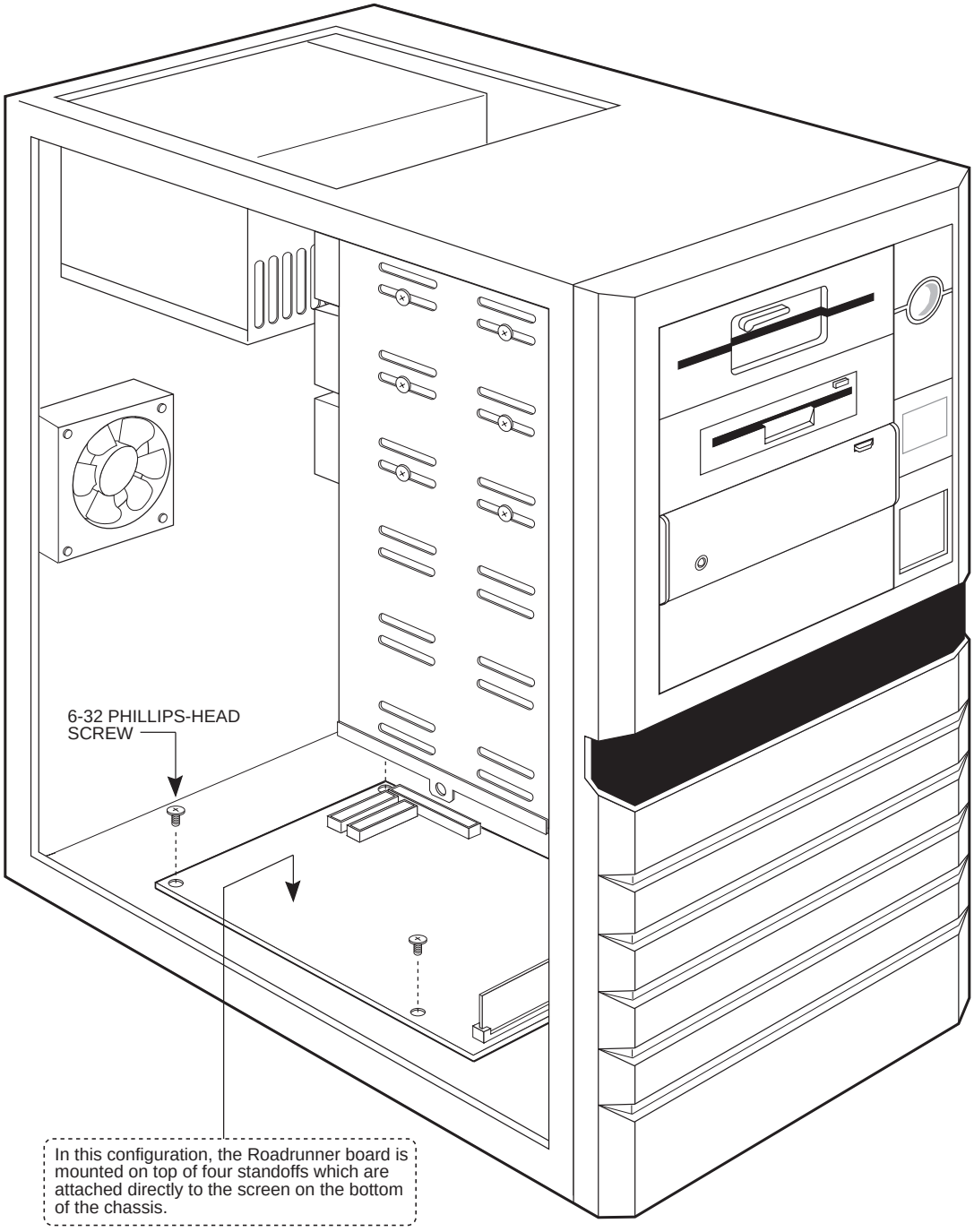


Roadrunner Mounting Bracket (Early Models)



When upgrading or replacing your Roadrunner board, you must first unplug the two cables from the X-Bus connectors, the 50-pin SCSI cable, and the 4-pin power cable. After unplugging the cables, simply remove the four screws shown above and you can remove the Roadrunner board from the assembly.

Roadrunner Installation (Early Models)



Roadrunner Installation (Late Model Eagle Computers)

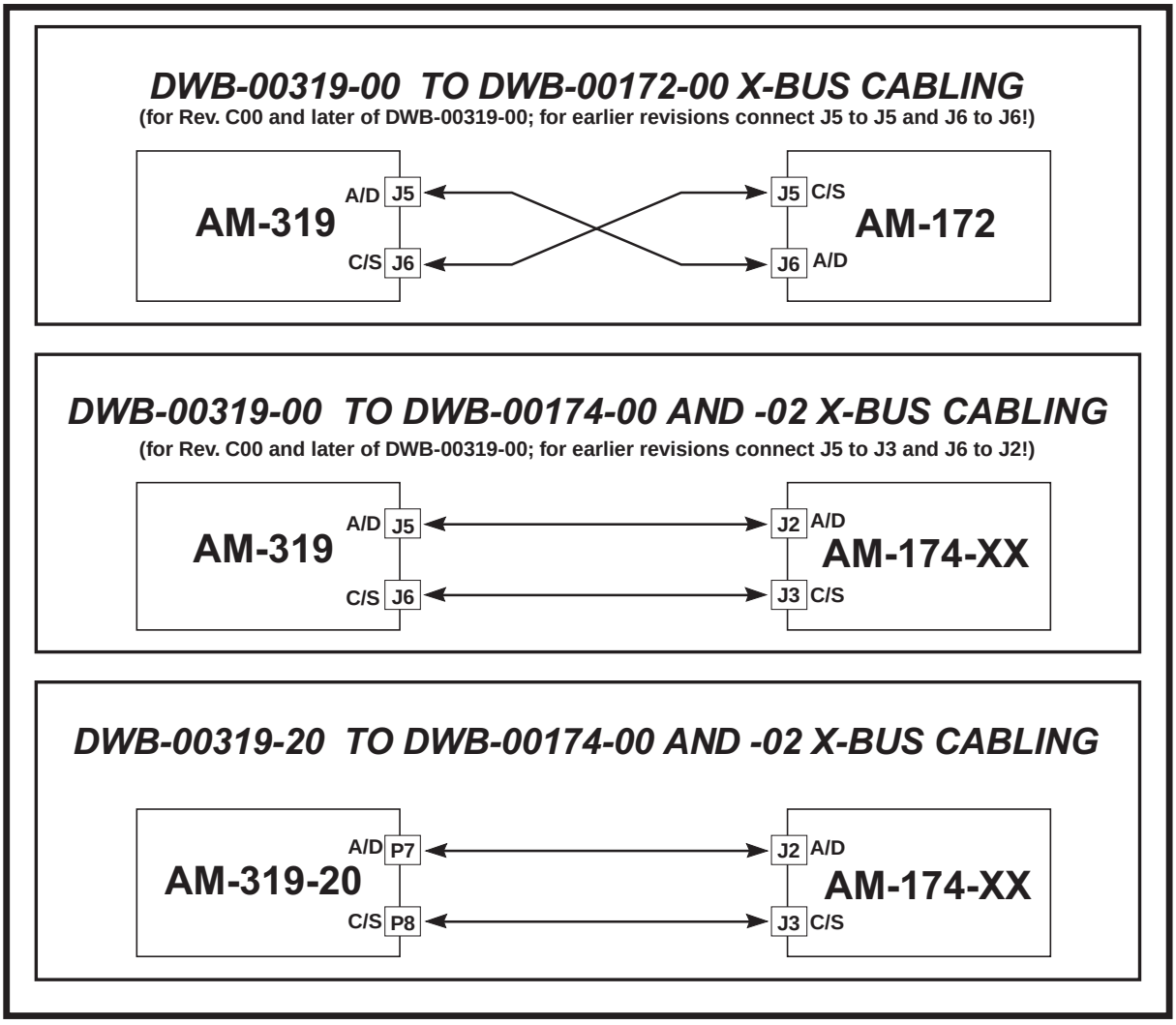
Connecting the DC Power Cable to the Roadrunner Board

The Roadrunner board has a standard 4-pin DC power connector. Simply take one of the 4-pin power cables extending from your power supply and plug it into the Roadrunner board. Although power connectors are keyed, with extra force they can be installed incorrectly, so be careful.

X-Bus Cabling Instructions

Two 34-pin cables create a data path between the AM-319 board and your Roadrunner board. The illustration below shows how the cables are connected between the various AM-319 and Roadrunner board combinations. All cable connections must be made pin-1 to pin-1.

The top two diagrams show connections for ***Rev. C00 and later*** AM-319-00 boards. On earlier versions of the boards, while the cables connected to the same physical locations, the labels on the board were reversed.



Eagle Computer X-Bus Cable Routing

Make sure to plug the X-bus cables in correctly. If the cables are not plugged in correctly, the system will not boot or run self-test, and ***the Roadrunner board could be seriously damaged!*** If your computer does not boot after doing the upgrade, turn off the system power and double check your cable connections.

Installing Peripheral Devices

Your Eagle computer has mounting positions for six half-height 5.25” peripherals. Four of these mounting positions are accessible through a cutout in the Eagle’s front panel. For instructions on installing peripherals, see the *Eagle Computer Service Manual*.

Connecting the 50-Pin SCSI Interface Cable

Your Eagle computer has a 50-pin SCSI cable; one end of the cable attaches to the rear panel of the computer; the other end of the cable attaches to the 50-pin connector on the Roadrunner board. The connectors in the middle of the cable attach to SCSI peripherals mounted inside your chassis.

The 50-pin connector is in exactly the same location on both the Roadrunner 030 and 040 boards. However, the connector is marked J1on the 040 board and J3 on the 030 board.

Make sure all connections to the 50-pin cable are made pin-1 to pin-1. This includes connections made to peripheral devices.

Because your Eagle computer uses an external terminator, you must insure that all SCSI peripherals inside your computer have their terminators removed.

INITIAL SYSTEM TESTING

Before you turn on the power, double check all your interface cabling and power connections. Once you are satisfied that all is in order, reinstall the computer’s top cover.

After installation is complete, run the Roadrunner Self Test program to make sure each subsystem is functional. The self test diagnostics are incorporated into the boot PROMs on the Roadrunner. Refer to the *Alpha Micro Self Test User’s Guide* for instructions.

Once you have completed self test, press the reset button and wait for the computer to boot. At the AMOS prompt, type:

SYSTAT RETURN

Check the system status information displayed by the SYSTAT program and insure all jobs applicable to your computer are up and running—e.g., terminal, printer, task manager, etc.