ALPHA MICROSYSTEMS
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Marketing Bulletin

AMB98-26 August 7, 1998

Announcing the Eagle 450

A new mid-range system with performance, price, and compatibility for the AMOS world

Contents

Announcing the Eagle 450

Dear Alpha Microsystems VAR:

We are proud to announce the Eagle 450, a new AMOS-based computer system. The Eagle 450 brings the latest Alpha Microsystems technology, built around Motorola's revolutionary *ColdFire*® processor, to the service of your applications and your customers. Highlights of this outstanding new product are as follows:

- **First of a new generation of AMOS processors** — The Eagle 450 is the first step in our migration from MC 680X0 CPUs to Motorola's newest microprocessor family: ColdFire. These technically innovative chips offer an ideal fit for the AMOS world: high performance, attractive cost, and software compatibility.

- **The latest Alpha Micro technology** — The Eagle 450 also embodies the latest technology from our own engineers. Leading-edge features include all-on-one-board processor design; RJ-45 serial ports with built-in lightning protection; and a wide SCSI bus. Network support includes TAME — short for **T**CP **A**ccess **M**ade **E**asy — that lets you add TCP communications to any AlphaBASIC or AMOS assembly language application.

- **A new level of price/performance** — The Eagle 450 is a mid-range system, with performance and connectivity in the same class with the Eagle 300 and Eagle 500. Expandability of the Eagle 450 is superior. Its price is lower. In fact, the Eagle 450 offers more performance per dollar than any Alpha Micro system we've built before.

- **PCI expansion slots** — As a standard feature, the Eagle 450 provides two industry-standard slots for PCI expansion cards. Software support is planned for a future release. Like the adoption of the ColdFire CPU, our provision for PCI cards — used by the millions to implement optional features in PCs — brings new technical sizzle to the AMOS marketplace.

- **Easy to configure** — It's a snap to spec out an Eagle 450. Your choice of wide or narrow SCSI. Memory in *any* mix of one or two SIMMs, from 4MB to 256MB. Use AM-314, 318, or 318-10 cards for I/O expansion. A 10BaseT Ethernet port is standard. And the new streamlined deskside chassis, shipping now for all Eagle models, looks very sharp.

- **Easy to buy** — Our Eagle 450 trade-in program makes business sense for current users of virtually any Alpha Micro small or mid-range computer. We offer field upgrades too, with kits for AM-1600 and Eagle 100, 300, and 500 systems. We want your business.

- **Our commitment to the future of AMOS** — Roll-out of the Eagle 450 climaxes a two-year, technology-intensive development program. It's evidence of our commitment to the future of the AMOS product line and to the AMOS community.

Product Overview

Where the Eagle 450 Fits in the AMOS Product Line

Table 1 opposite shows where the Eagle 450 fits in the AMOS product line. A maximum of 32 serial ports makes the Eagle 450 a mid-range system, in a class with the Eagle 300 and Eagle 500. Performance is impressive. The Eagle 450's ColdFire RISC CPU yields an SI (System Index) rating of 68.5. That's faster than an AM-4000, a much larger and more expensive system.

Other advanced features of the Eagle 450 include:

- Memory from 4MB to 256MB — the widest range of choices we've ever offered.
- A Wide SCSI bus for maximum throughput with high-performance peripherals; the system can be ordered with a narrow (8-bit) SCSI bus instead.
- Two PCI expansion slots are standard. These are the same slots found in most PCs today, used for add-in features. We intend to support selected PCI cards on future releases; support is not offered at this time.
- The Eagle 450 is a superb upgrade vehicle for an existing Eagle 100, Eagle 300, or AM-1600 system. Install an Eagle 450 upgrade kit and get twice the CPU horsepower, improved Ethernet, more memory capacity, and a Wide SCSI bus for top peripheral performance.

ColdFire Technology

In the Eagle 450, all CPU and I/O logic is implemented on a single board. At the heart is a Motorola ColdFire processor chip. ColdFire is a microprocessor family with strength in three areas vital to AMOS computers. The areas are high performance, attractive cost, and software compatibility.

Motorola conceived ColdFire as a new branch of the MC680X0 family tree. To meet targets for performance, compatibility, and cost, Motorola developed *Variable-Length RISC technology*. VL RISC unites the architectural simplicity of conventional 32-bit fixed-length RISC with a fast-executing, memory-saving, variable-length instruction set.

Motorola has a long-range plan for ColdFire. The plan defines a series of architectural upgrades coupled with projected advances in processor technology. The result will be ColdFire CPUs with power well beyond the 68K family. For example, Motorola envisions a ColdFire chip with performance in the area of 300 MIPS — far faster than the 68060 we use in the AM-6000.

Our long-term objective is a whole new line of AMOS systems, all drawing on the cost-effective power of ColdFire and all preserving the compatibility to support your applications. The Eagle 450 is where that line begins.

Table 1. AMOS Product Line

Eagle 450 *— A mid-range system with more CPU speed than an AM-4000*

	Popular AMOS-based Systems*					
	Eagle 100	**Eagle 300**	**Eagle 450**	**Eagle 500**	**Super Eagle**	**AM-6000**
System						
Performance: SI	**39.1**	**39.1**	**68.5**	**79.9**	**79.9**	**137.0**
CPU	MC68030	MC68030	ColdFire RISC	MC68040	MC68040	MC68060
Memory: min./max.	4MB/32MB	4MB/32MB	4MB/256MB	4MB/64MB	4MB/64MB	8MB/256MB ①
16-bit, Wide SCSI bus	--	--	Available	--	--	Available
Input/Output						
Serial ports, standard	8	8	8	8	4	4
Serial ports, maximum	16	32	32	32	200+	200+
I/O Expansion Cards	AM-314 / 318	AM-314 / 318	AM-314 / 318	AM-314 / 318	AM-359	AM-359
Parallel Ports	1	2	1	2	4	4
Networking						
Ethernet Controller	Optional; AM-366 card required	Standard; integrated on system board	Standard; integrated on system board	Standard; integrated on system board	Standard; integrated on system board	Standard; integrated on system board
10BaseT (twisted pair) Ethernet Port	Optional	Standard	Standard	Standard	Standard	Standard ②
UPS Monitoring	Consumes a serial port	Consumes a serial port	Dedicated UPS port	Consumes a serial port	Dedicated UPS port	Dedicated UPS port
Bisync RJE	Opt. (AM-338)	Opt. (AM-338)	Opt. (AM-338)	Opt. (AM-338)	--	--
PCI Expansion						
Slots for PCI add-in cards (future support)	--	--	2 PCI slots, standard ③	--	--	--
AMOS						
AMOS Versions Supported	2.3A 2.2C 1.4C, 1.4E	2.3A 2.2C 1.4C, 1.4E	2.3A	2.3A 2.2C 1.4C, 1.4E	2.3A 2.2C	2.3A

Notes

* Other models, not shown here: Falcon, Eagle 100LC, AM-4000, and AM-6060 Network Server.
① 512MB memory available on systems with processor board at appropriate revision level.
② 10BaseT Ethernet port furnished as standard on AM-319-20 System Board; optional on AM-176 processor board.
③ Not supported on initial product release.

Quick Tour of the Processor

The Eagle 450's single-board processor, the model AM-138, is the latest in our long line of powerful, versatile single-board CPUs. Follow the numbered callouts in Figure 1 opposite for a quick tour of the AM-138.

1 **Memory** — Two SIMM slots accommodate main memory from 4MB to 256MB. See memory configurator on page 7 for details.

2 **Cache** — 64KB external cache for maximum CPU performance; mounted on plug-in card.

3 **Expansion slots** — Three AM-318 style, serial I/O expansion slots; accessible at rear panel.

4 **Standard serial I/O** — Eight standard serial ports; see page 8 for configuration guidelines.

5 **SSD chip** — Same chip as used in Roadrunner boards and other Eagle systems.

6 **UPS port** — Dedicated DB-9 port for UPS monitoring; see page 12.

7 **Parallel port** — DB-25 parallel printer port.

8 **CMOS setup** — Flexible, terminal-driven setup facility replaces boot switches.

9 **Ethernet port** — AUI *and* 10BaseT (twisted-pair) Ethernet ports are standard equipment.

10 **Ethernet controller** — 16-bit, dual-port, Ethernet controller; much faster than an AM-366.

11 **PCI expansion slots** — Connector slots for two PCI expansion cards. This unique feature of the Eagle 450 will allow cost-effective, plug-in expansion using industry-standard PCI cards. Planned for support on a future release, PCI add-ins are not available at this time. See page 12 for further information.

12 **68K-to-PCI Bridge** — Key to PCI compatibility, this controller-on-chip bridges the gap between MC68000 architecture and PCI architecture.

13 **Narrow SCSI bus** — 50-pin connector for bus on narrow SCSI Eagle 450.

14 **Wide SCSI bus** — 68-pin connector for bus on Wide SCSI Eagle 450 (a miniaturized design, physically smaller than the 50-pin narrow SCSI connector).

15 **SCSI controller** — 32-bit, bus-master RISC processor.

16 **R & D test point** — Socket for connecting test equipment (logic analyzer) during engineering development; to be phased out during initial production run.

17 **Motorola *ColdFire* processor** — Small but powerful CPU, embodying Motorola's innovative Variable-Length RISC architecture, delivers big-system throughput for the mid-range Eagle 450.

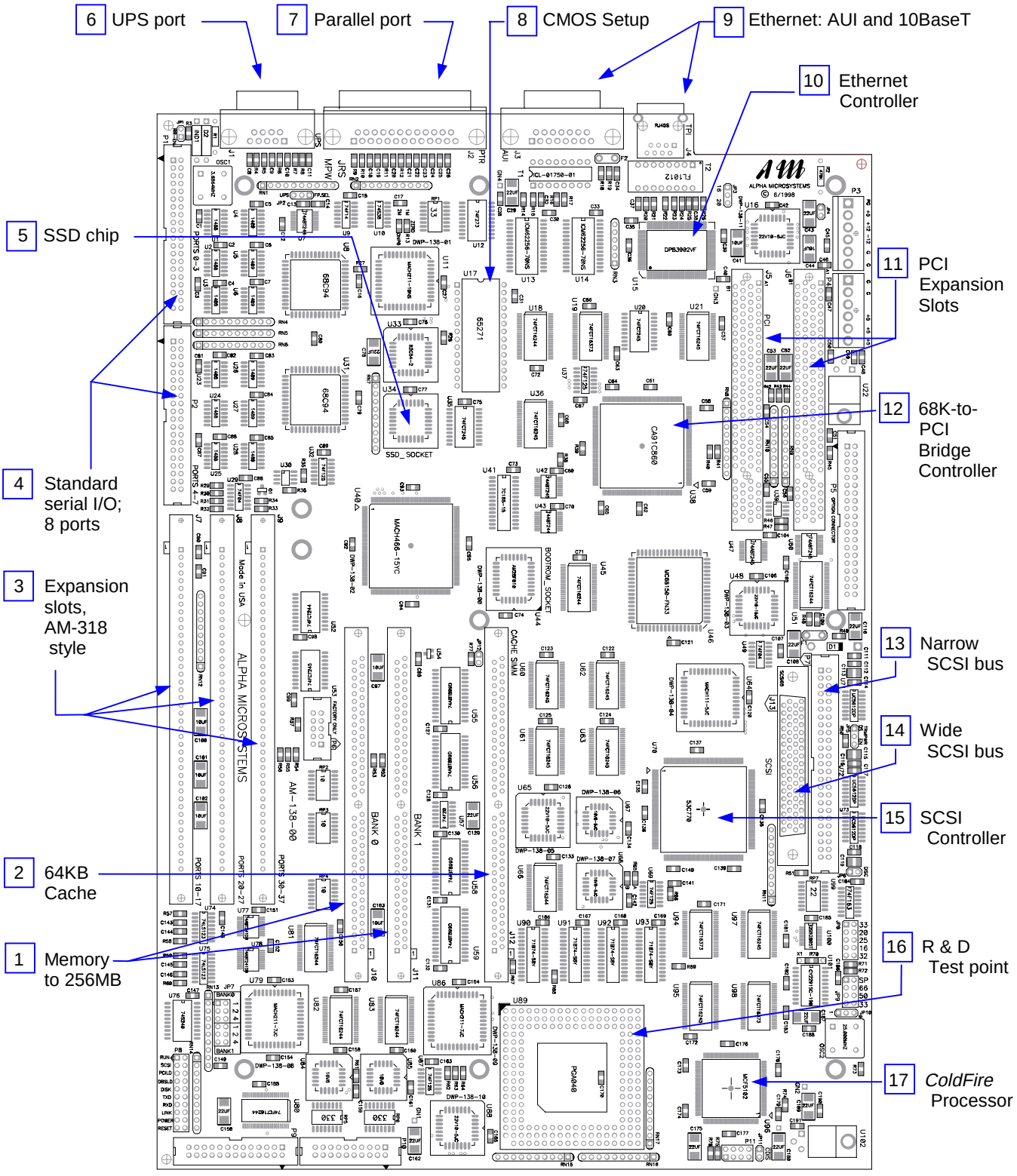


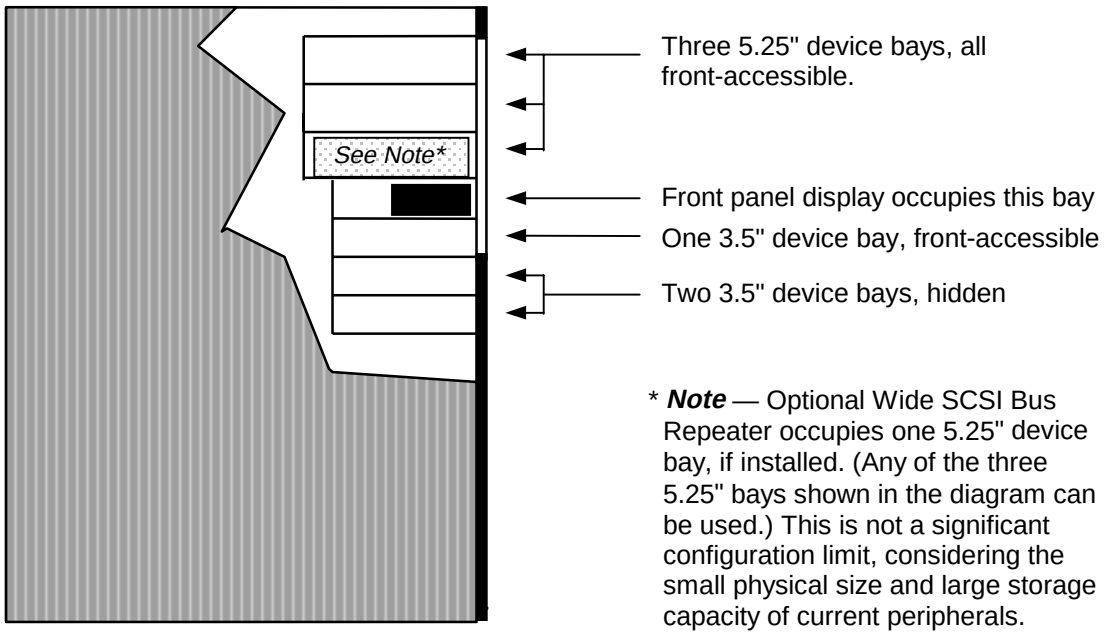
Figure 1. AM-138 Processor Board

Eagle 450 Product Description

Chassis

The Eagle 450 is furnished in the new, streamlined, Eagle deskside chassis. Specifications are as follows:

- **Dimensions**—17¾" high x 9" wide x 17" deep (44.5 cm x 22.9 x 43.1)
- **Power requirement**—5 amp @ 115VAC; 2.5 amp @ 230VAC
- **Peripheral mounting**—The chassis accommodates up to six peripheral devices. Figure 2 shows details.



Cutaway view from left side

Figure 2. Eagle 450 Chassis: Peripheral Mounting Bays

Memory

The Eagle 450 supports a minimum of 4MB and a maximum of 256MB of main memory. Using a new, flexible, memory architecture, the processor is equipped with two SIMM sockets. *Any combination* of one or two PFB-00712-XX SIMMs can be installed. Upgrades are easy. If an Eagle 450 has one SIMM installed and needs more memory, just add a second SIMM.

Table 2 below shows all allowable SIMM combinations.

Table 2. Eagle 450 Memory Configurator

Install these memory SIMMs... ↓ ↓	**… to obtain this amount of Main Memory**													
	4 MB	**8 MB**	**8 MB**	**12 MB**	**16 MB**	**16 MB**	**20 MB**	**24 MB**	**32 MB**	**32 MB**	**36 MB**	**40 MB**	**48 MB**	**64 MB**
PFB-00712-04 4MB Memory, 60ns	1	*2		1			1				1			
PFB-00712-08 8MB Memory, 60ns			*1	1	2			1				1		
PFB-00712-16 16MB Memory, 60ns						1	1	1	2				1	
PFB-00712-32 32MB Memory, 60ns										1	1	1	1	2
PFB-00712-64 64MB Memory, 60ns														
PFB-00712-C8 128MB Memory, 60ns														
	64 MB	**68 MB**	**72 MB**	**80 MB**	**96 MB**	**128 MB**	**128 MB**	**132 MB**	**136 MB**	**144 MB**	**160 MB**	**192 MB**	**256 MB**	
PFB-00712-04 4MB Memory, 60ns		1						1						
PFB-00712-08 8MB Memory, 60ns			1						1					
PFB-00712-16 16MB Memory, 60ns				1						1				
PFB-00712-32 32MB Memory, 60ns					1						1			
PFB-00712-64 64MB Memory, 60ns	1	1	1	1	1	2						1		
PFB-00712-C8 128MB Memory, 60ns							1	1	1	1	1	1	2	

* Example — You can make an 8MB system with two 4MB SIMMs ***or*** one 8MB SIMM.

New flexibility for a mid-range system: use 1 or 2 SIMMs in any mix of sizes.

Serial I/O for the Eagle 450

The Eagle 450 comes equipped with eight serial ports as standard. The processor board includes three AM-318 style expansion slots, accommodating up to 24 additional ports. All ports mount in Centronics-style cutouts in the rear of the chassis. See Figure 3. This versatile arrangement fits the full range of I/O boards in the AM-314/AM-318 family.

Eight Standard Ports

The eight standard ports are driven directly from the system processor board. A cable harness leads from the processor board to eight RJ-45 ports in the rear panel. See **(A)** in Figure 3. The ports provide full modem control, Super I/O compatibility, and built-in lightning protection. Pinouts are the same as those on an AM-359 card.

Optional Ports: AM-318-10

Introduced this past January, the AM-318-10 is a highly-featured, technically-advanced, serial I/O interface. The card provides eight RJ-45 ports, with full modem control, Super I/O compatibility, and built-in lightning protection. See **(B)** in Figure 3. You can configure an AM-318-10 in each of the Eagle 450's three I/O expansion slots. Three cards plus the eight standard ports provide the maximum system configuration of 32 serial ports.

Optional Ports: Older I/O Cards

For optimum fit with your existing customer sites and your existing parts inventory, we designed the Eagle 450 to use older I/O cards as well as the new AM-318-10. See **(C)** in Figure 3. All of the following are fully compatible:

AM-314 — The AM-314 provides four DB-9 serial ports. In the Eagle 450, each Centronics-style cutout accommodates two DB-9 connectors. The connectors mount in a DWF-20519-04 Adapter. A set of four adapters comes with the Eagle 450; order more if needed. You can add AM-90 boards for RJ-45 connectors and lightning protection.

AM-318 — The original AM-318 provides eight serial ports, presented to the user at a single RJ-21 50-pin telco connector. The connector occupies one Centronics cutout.

AM-318-02 — This product combines the circuit board of the original AM-318 with eight RJ-45 ports. Lightning protection is provided, but not full modem control.

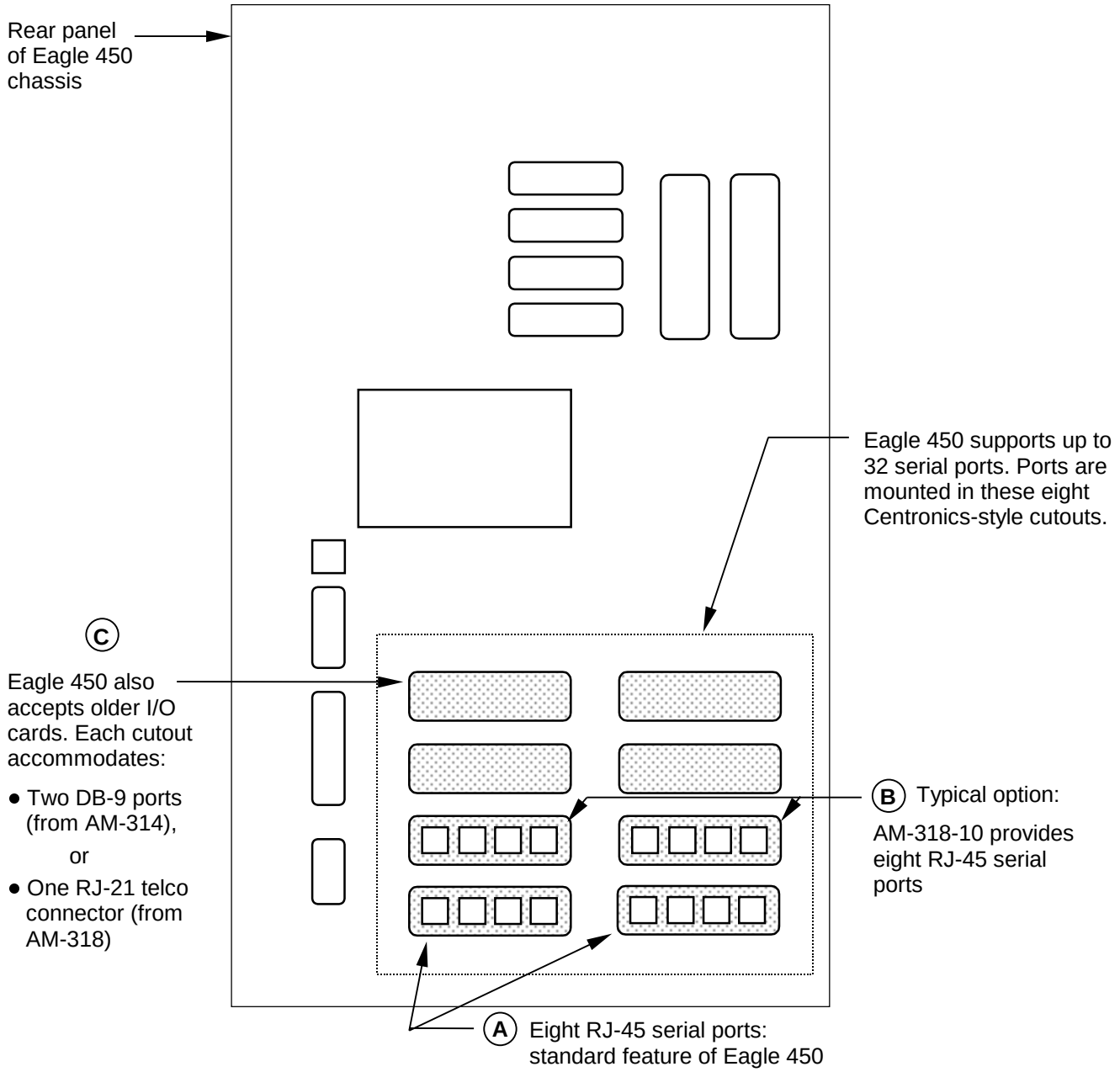
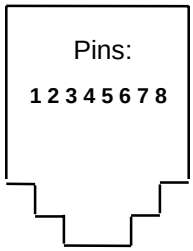


Figure 3. Eagle 450 Serial Ports

Pinouts

The standard serial ports on the Eagle 450, and the ports on the optional AM-318-10 card, are RJ-45 modular jacks. This interface presents the same pinouts as an AM-359 card, and provides full modem control.

Another serial port option compatible with the Eagle 450, and also providing RJ-45 ports, is the AM-318-02. The ports look the same from the outside but the pinouts are different. See the table in Figure 4 for details. Because of the difference in wiring, the AM-318-02 does not provide full modem control.



View from outside the Eagle 450 chassis, looking into an RJ-45 serial port

			RJ-45 pins that are active in this Eagle 450 serial port implementation:		
Pin No.	Description		Standard 8 ports	AM-318-10	AM-318-02
1	Chassis Ground (shield)	GND	✔	✔	✔
2	Clear to Send	CTS	✔	✔	✔
3	Transmit Data	TXD	✔	✔	✔
4	Request to Send	RTS	✔	✔	✔
5	Receive Data	RXD	✔	✔	✔
6	Data Terminal Ready	DTR	✔	✔	
7	Signal Ground	GND	✔	✔	✔
8	Data Carrier Detect	DCD	✔	✔	

Figure 4. RJ-45 Pinouts on Eagle 450

Surge Protection

Surge protection is a standard feature of RJ-45 serial ports on the Eagle 450. Protection is implemented by an array of zener diodes, sometimes called avalanche diodes. The diodes are mounted on AM-90 Lightning boards furnished as part of the port assembly.

If an over-voltage condition occurs on the serial I/O cable, the diodes react—in nanoseconds—to divert the flow of current away from sensitive I/O circuitry. A system that's installed and grounded in accordance with Alpha Micro standard practice should withstand virtually any power surge without damage. However, the exact characteristics of power surges are difficult to predict. (Consider what can happen, for example, when a high-voltage power line comes loose in a storm and drops across telephone wires carrying modem traffic.) The presence of AM-90 Lightning boards, therefore, does not affect our warranty coverage.

An AM-90 Lightning board protects the system inside which the board is installed. Surge protection for terminals or other far-end devices, if desired, must be implemented by other means.

Adapter Cables

I/O cables at existing Alpha Micro sites may terminate in DB-9 connectors, modem connectors, patch cord hookups, or other connectors not directly compatible with the RJ-45 ports on the Eagle 450. We offer adapter cables and connectors to provide the necessary compatibility. Table 3 gives a list. For pinouts and other details see Appendix A in PDI-00359-00, *AM-359 Eight-Port Serial I/O Board; Installation Instructions.* The document is available at our Web site. The same information will appear in the *Eagle 450 Installation and Technical Manual*.

Table 3. Serial I/O Adapter Cables

Cable Part Number and Description	Cable Connectors Nearest to AM-318-10	Connector(s) on Far End of Cable or Adapter	Remarks
PDB-00359-50 Cable Set, AM-359* to AM-355, 8 Cable	8 x RJ-45	8 x DB-9 female	For installations where the AM-318-10 will connect to existing DB-9 cables. Example: a site being upgraded from an older Alpha Micro system, which used AM-355 serial I/O cards.
PDB-00359-51 Cable, AM-358 Conv, 8P6W	8 x RJ-45	1 x RJ-21 female	Connects the AM-318-10 to a 6-wire patch panel.
PDB-00359-52 Cable Set, AM-359* 6P8W + 2 FDB9	6 x RJ-45	1 x RJ-21 female + 2 x DB-9 female	Connects the AM-318-10 to an 8-wire patch panel that uses a 4-pair wiring system.
PDB-00359-53 Adapter Set (4), RJ45 MDB25 Modem	4 x RJ-45	4 x DB-25 male	Connects the AM-318-10 to modems. 8-wire patch cords also required; see PDB-00359-56.
PDB-00359-54 Adapter Set (4), RJ45 MDB25 CRT	4 x RJ-45	4 x DB-25 male	Connects the AM-318-10 to printers or terminals. 8-wire patch cords also required; see PDB-00359-56.
PDB-00359-55 Adapter Set (4), RJ45 FDB9 PC-AT	4 x RJ-45	4 x DB-9 female	Connects the AM-318-10 to PC-AT style serial port. 8-wire patch cords also required; see PDB-00359-56.
PDB-00359-56 Cable Set (4), RJ45 Straight, 10-ft.	4 x RJ-45	4 x RJ-45	10-foot, shielded, parallel (straight-through) patch cords; for use with adapters listed above.

* Originally developed for the AM-359 card, this cable works the same way with an AM-318-10 or with the eight standard ports on an Eagle 450, all of which have the same RJ-45 pinouts.

Parallel Port

The Eagle 450 is equipped with one DB-25 parallel port. See Figure 5. The port is functionally identical to the parallel port on an Eagle 100.

Ethernet Ports

Ethernet connectivity is a standard feature of the Eagle 450. Two ports are provided: an RJ-45 jack for connection to a 10BaseT Ethernet and a DB-15 connector for attaching an AUI. You can use either port, but not both at the same time.

The Eagle 450 uses an Ethernet controller-on-a-chip (National Semiconductor DP83902) integrated on the processor board. The controller provides efficient, high-throughput operation at 10 megabits per second. Fast Ethernet (100BaseT) is planned as an optional feature on a future release.

UPS Monitoring Port

The Eagle 450 includes a dedicated DB-9 port for monitoring the switch contacts in an attached uninterruptible power supply. See Figure 5. The switch contacts give basic UPS status information, such as power fail and low battery. A separate connection, from the UPS to a serial port, is required if the user wishes to observe software-monitored functions, such as load, voltage, and fault status.

External SCSI Port

The external SCSI port is the attachment point for a SCSI terminator or for the cable from an external SCSI device. See “SCSI Devices for the Eagle 450,” below, for configuration information.

PCI Slots

PCI, short for Peripheral Component Interconnect, is the dominant local bus technology in Intel-based PCs and servers. Mass production for this huge market has produced PCI add-in boards, such as disk controllers and LAN cards, with excellent performance and low prices. The use of PCI is spreading beyond PCs into industrial equipment. This in turn has stimulated the development of bridge technology for interfacing PCI cards to Motorola circuitry. Our engineers have implemented that technology on the Eagle 450 processor board in the form of two PCI card slots. Each slot is a 120-pin connector. When a standard PCI card is plugged into the slot, the external connector on the card will be accessible at the Eagle 450 rear panel in customary PC fashion.

We envision a number of applications for PCI cards in the AMOS environment. Software support for such applications awaits development. Until then, the slots are concealed behind a cover plate on the rear panel. Please watch for news of PCI applications for the AMOS world.

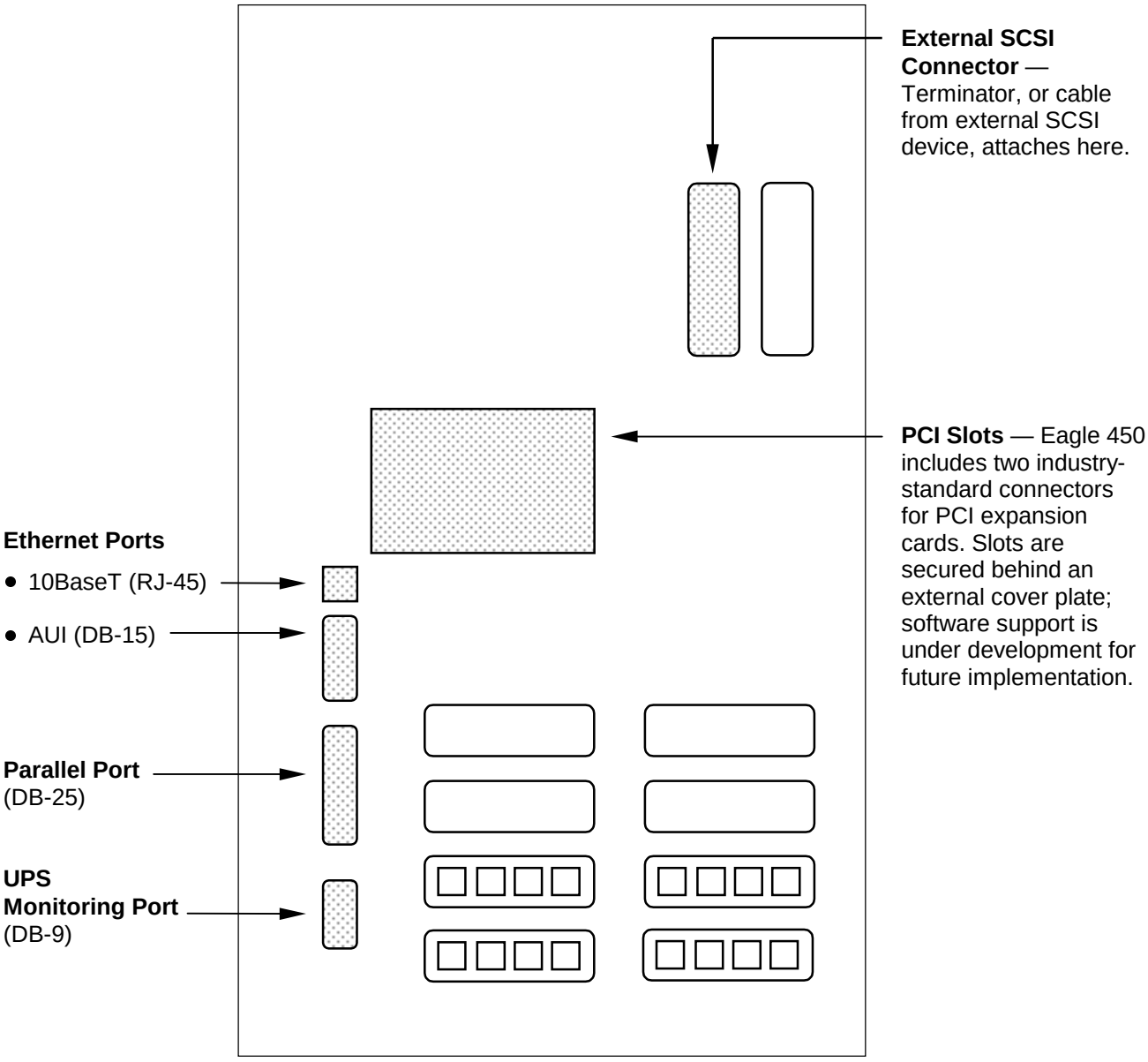


Figure 5. Eagle 450 Ports

SCSI Support

The Eagle 450 incorporates our latest and most powerful SCSI technology, including a Wide SCSI bus for connection to high performance peripherals. This page explains your choice in busses: wide or narrow. Configuration rules for individual SCSI devices start on page 16.

SCSI Busses: Wide vs. Narrow

The Eagle 450 includes a 32-bit bus-master SCSI controller, integrated on the AM-138 processor board. As standard, the board provides two interfaces from the controller to SCSI devices. One interface is a 50-pin narrow SCSI connector. The other is a 68-pin Wide SCSI connector. See the illustration of the AM-138 board on page 5. In an installed Eagle 450, a bus cable runs from one, and only one, of the two connectors to all SCSI devices in the system. Your choices are:

- *A 50-conductor SCSI cable* is furnished when you order a Narrow SCSI Eagle 450 System, part number SBC-EG450-01. This is the same type of SCSI cable used in earlier Eagle systems and in Roadrunner 030 and 040 systems. The bus is one byte wide (8 bits plus parity) and supports a maximum transfer rate of 10 megabytes per second.
- *A 68-conductor Wide SCSI cable* is furnished when you order a Wide SCSI Eagle 450 System, part number SBC-EG450-02. The Wide SCSI bus is two bytes wide and supports a maximum transfer rate of 20MB per second. Disk-intensive applications are potentially faster with the Wide SCSI bus and a Wide SCSI disk drive. Wide SCSI also has the advantage in multi-disk configurations. Spreading a file and its index across two Wide SCSI disks, for example, boosts the performance advantage of each disk.

The two bus cables are mutually exclusive. Mixes, with some devices on one bus and some on the other, are not supported. Table 4 opposite summarizes the characteristics of the two busses.

If You Order an Eagle 450 with Narrow SCSI (SBC-EG450-01):

An Eagle 450 in the narrow SCSI configuration supports our familiar SCSI-2 disk drives (part number PDB-00436-XX), tape streamers, DATs, and other narrow SCSI peripherals.

The system will also accept Wide SCSI devices. Examples include Fast-Wide SCSI-2 disks, such as our PDB-00440-XX 2.1GB and 4.3GB drives, and the 26GB ¼-inch cartridge tape streamer. Each such device requires a PDB-00440-90 Adapter to mate with the 50-pin SCSI cable. In this environment, Fast-Wide devices will perform at about the same speed as narrow SCSI-2 devices.

If You Order an Eagle 450 with Wide SCSI System (SBC-EG450-02):

For maximum system throughput, order the Eagle 450 in the Wide SCSI configuration. Data moves in and out of the disk buffers faster because the interface to the system is 16 bits wide, instead of the 8-bit path used in SCSI-2 drives. The Wide SCSI bus cable provides 68-pin connectors that mate directly with the 68-pin connectors on Fast-Wide SCSI-2 devices.

Table 4. Choice of SCSI Busses in the Eagle 450

	Narrow SCSI Bus	Wide SCSI Bus
Availability		
Availability in the Eagle 450	Standard in SBC-EG450-01 Eagle 450, Narrow SCSI	***Standard*** in SBC-EG450-02 Eagle 450, Wide SCSI ***Optional upgrade*** for system originally with narrow SCSI
Technology		
Bus width	One byte (8 bits + parity)	Two bytes (16 bits + parity)
Maximum transfer rate	10 Mbytes/sec	20 Mbytes/sec
Connection to SCSI Devices		
Maximum number of SCSI devices you can connect to the bus	7 total, including internal and external devices	***Internal***: 5 devices, maximum ***External***: Depends on cable length; up to 8 feet allowed with AM-441 SCSI Repeater.
Connectors on bus for attaching devices	50-pin	68-pin
How peripherals connect to the bus:		
Devices with *50-pin* SCSI Connector • SCSI-2 disks (“narrow disks”) • Streamer tapes, 2GB or less • DAT tapes • Other standard SCSI-2 devices	← These devices connect directly to the SCSI bus, same as in Roadrunner 030 and 040 systems, Eagle 100, and earlier Eagle systems.	Each 50-pin device requires a PDB-00440-91 Adapter to connect to the Wide SCSI bus.
Devices with *68-pin* Wide SCSI Conn. • Fast-Wide SCSI-2 or UltraSCSI disks • 26GB ¼" streamer tape	← Each device requires a PDB-00440-90 Adapter to connect to the SCSI bus.	Since these devices have a 68-pin data connector, they connect directly to the 68-pin Wide SCSI bus.
External SCSI Connector	50-pin connector, same as in Roadrunner and other Eagles. Installation kit includes 50-pin SCSI terminator.	68-pin Wide SCSI external connector. Installation kit includes 68-pin Wide SCSI Active Terminator.
Recommendations		
What happens when wide and narrow SCSI disk drives are installed in the same system?	Wide SCSI disks will be no faster than narrow disks.	Not recommended: Wide SCSI performance advantage will be sacrificed.
Your Decision — The Eagle 450 is available with either bus style. We recommend the following for maximum performance: • Order the Wide SCSI configuration: SBC-EG450-02. • Order Wide SCSI disk drives (part number PDB-00440-XX). • Order a PDB-00440-91 Adapter for each narrow SCSI device in the system.		

The Wide SCSI bus also accommodates Ultra SCSI disk drives. With present Eagle 450 hardware and software, Ultra SCSI drives provide the same performance as Fast-Wide SCSI-2 disk drives.

When you order a Wide SCSI Eagle 450, you'll also need to order a PDB-00440-91 Adapter for each narrow SCSI-2 device, such as a 525MB or other prior model tape streamer. The adapter is a 50-to-68-pin width-changer that lets narrow devices connect to the wide bus.

SCSI Devices for the Eagle 450

A wide choice of disks, tapes, and other SCSI devices helps tailor the Eagle 450 to specific site requirements. Table 5 summarizes current offerings. The system supports up to five SCSI devices mounted inside the system chassis (internal devices). Additional SCSI devices can be installed outside the chassis (external devices).

General Configuration Guidelines

Each SCSI device requires mounting space and a connection to the SCSI bus. Table 5 shows the type of connection that each device requires: narrow SCSI or Wide SCSI. Mounting requirements are shown for internal devices. See the Eagle 450 chassis diagram on page 6 for bay locations inside the chassis.

Configuring a Wide SCSI System

The electrical characteristics of the Wide SCSI bus, and the high bit-transmission rates it permits, impose added configuration rules. The following should be noted:

1. With a standard Wide SCSI Eagle 450, the maximum length of external cabling, starting from the external SCSI connector on the chassis, is three feet (91 cm). In practice that usually means a maximum of one external device.

2. Adding the optional AM-441-00 Wide SCSI Bus Repeater, described below, increases the maximum external cable length to eight feet (243 cm). That amount of cabling will normally allow up to three external devices.

3. If the external devices include a mix of Wide SCSI and narrow SCSI, the narrow devices must be grouped at the outboard end of the cabling, farthest from the chassis.

4. An external cable is standard with some devices and optional with others. We offer the cables listed in Table 6. If you plan to supply your own cables, make sure they're fabricated to SCSI-2 construction standards.

9GB disk drive now available for AMOS systems

*Table 5. SCSI Devices for the Eagle 450**

Part Number	Description	Interface†			Mounting Bay	Remarks
	Internal Devices					
PDB-00436-XX	SCSI-2 Disk Drives	N		50-pin	3.5"	1GB, 2GB; see current AMOS price list for compatible models
PDB-00440-XX	Fast-Wide SCSI-2 Disk Drives		W	68-pin	3.5"	2.1GB, 4.3GB, 9GB
PDB-0062X-00	¼" Tape Streamers	N		50-pin	5.25"	525MB, 1GB, 2GB, 4/8GB. See bulletin AMB98-20; 6 Jun 98
PDB-00650-00	¼" Tape Streamer, 13/26GB		W	68-pin	5.25"	See bulletin AMB97-30; 27 Aug 97
PDB-00649-XX	DAT Tape Drives	N		50-pin	5.25"	4GB, 8GB
PDB-00212-20	3.5" Diskette Drive, SCSI	N		50-pin	3.5"	***New product*** — Attaches to SCSI bus; no floppy controller required
PDB-00401-51	CD-ROM, Internal, SCSI	N		50-pin	5.25"	
PDB-00441-00	Wide SCSI Bus Repeater		W	68-pin	5.25"	Does not count as a 'SCSI Device'
	External Devices					
PDB-00446-XX	AM-446 RAID Subsystem		W	68-pin		See bulletin AMB97-41; 22 Dec 97
PDB-00401-50	CD-ROM, External, SCSI	N		50-pin		
PDB-00642-00	SCSI-to-Pertec Converter, Ext.	N		50-pin		See accompanying text for cables
- - - -	Portable CD-ROM players					See accompanying text for cables
PDB-03501-00	AM-3501 Expansion Subsystem	N	W	Either		Not a SCSI device itself; provides mounting for up to four half-height, Wide or narrow SCSI devices. Connects to Wide or narrow AMOS host system.

For *any* external device on a Wide SCSI system: do not use a cable longer than 3 ft unless the system is equipped with a Wide SCSI Bus Repeater.

* As of August 1998. New devices, higher capacities, and more cost-effective configurations are constantly being added. See Marketing Bulletins, or call your Order Administrator, for the latest information.

† N = narrow SCSI bus; W = Wide SCSI bus.

AM-441-00 Wide SCSI Bus Repeater

The Wide SCSI Bus Repeater is an optional hardware feature for systems equipped with the Wide SCSI bus. The Repeater acts as a booster to electronically extend the Wide SCSI bus. The Repeater does not count as a SCSI device itself. As noted above, the Repeater is mandatory if more than three feet of SCSI cabling will be installed outside the chassis. The Repeater occupies one 5.25" device bay in the system chassis.

The Repeater is not required if all SCSI devices are installed inside the Eagle 450's deskside chassis. The Repeater works in Wide SCSI systems only. In systems equipped with the narrow SCSI bus, the Repeater is not required and is not installable. For more information see Marketing Bulletin AMB98-04, *New Wide SCSI Versatility — Shipping Now*, January 23, 1998.

SCSI Disk Drives

The Eagle 450 supports all currently available SCSI-2 disk drives, including narrow SCSI drives (PDB-00436-XX) and Fast-Wide SCSI-2 drives (PDB-00440-XX).

SCSI Tape Drives

The Eagle 450 supports all current SCSI tape drives. Models include the AM-62X family of ¼" streamers; AM-649-XX DAT drives; and the AM-650, a Wide SCSI ¼" streamer that stores up to 26GB on a single tape cartridge.

AM-446 RAID Subsystem

For Eagle 450 installations that require large, highly reliable mass storage, specify our AM-446 RAID Subsystem. Configurations start as small as 4.3GB of usable storage with RAID 1 (mirroring). The subsystem can be expanded to over 60GB of RAID 5 storage in the same desktop enclosure. Disk drives are UltraWide SCSI with 40 megabytes per second transfer rate. The AM-446 includes facilities for system installers and support managers to:

- Configure the AM-446 with hot spare or warm spare disk drives for on-site support.
- Manage, monitor, and configure the AM-446 by communication from a remote site. The AM-446 can automatically transmit e-mail messages to report its own system status, including errors and out-of-range conditions.
- Configure the AM-446 as a bootable SCSI device; the subsystem can coexist with other SCSI disk drives in the same Eagle 450.

For more information see Marketing Bulletin AMB97-41, *AM-446 RAID Subsystem Announced*, Dec. 22, 1997.

Table 6. External SCSI Cables

		Use This Cable to Connect Chassis to Device	
External SCSI Connector on Eagle 450 Chassis	**Connector on External SCSI Device**	**Cable Part Number**	**Description**
68-pin	50-pin	PDB-00440-80	Cable, 50-pin Centronics to 68-pin Ext. SCSI, 3 ft.
68-pin	50-pin	PDB-00440-81	Cable, 50-pin Centronics to 68-pin Ext. SCSI, 6 ft.*
68-pin	68-pin	PDB-00440-82	Cable, Wide SCSI, 68-pin/Male, 68-pin Male, 6 ft.*
68-pin	68-pin	PDB-00440-83	Cable, Wide SCSI, 68-pin/Male, 68-pin Male, 3 ft.

* To use a 6 ft. cable and stay within Wide SCSI cable guidelines, an Eagle 450 must be equipped with the AM-441-00 Wide SCSI Bus Repeater.

Portable CD-ROM Players

Many Alpha Micro VARs and developers use a portable CD-ROM player to load software at customer sites. If you do, you'll need a 68-pin cable to connect to a Wide SCSI Eagle 450. Order a PDB-00440-81 External SCSI cable (50-pin Centronics connector to 68-pin External SCSI, 3 ft) and keep it with the CD-ROM player. **Do not use a cable longer than three feet unless the Eagle 450 is equipped with an AM-441-00 Wide SCSI Bus Repeater.**

AM-642 SCSI-to-Pertec Converter ("SToP Converter")

The AM-642 is an interface unit that connects an AMOS-based host system to a Pertec-compatible ½" tape drive. The external version, model AM-642-00, is mounted in a desktop chassis and cabled to the host. Cabling arrangements are as follows:

- **With a Narrow SCSI Eagle 450** — The AM-642-00 comes with a 3 ft. (0.9m), 50-conductor cable. Plug the cable to the external 50-pin SCSI connector on a narrow SCSI Eagle 450
- **With a Wide SCSI Eagle 450** — For a Wide SCSI Eagle 450, order one of the following SCSI cables to connect the AM-642 to the Wide SCSI external connector on the system chassis:
  - PDB-00440-80 Cable, 50-pin Centronics to 68-pin External SCSI, 3 ft.
  - PDB-00440-81 Cable, 50-pin Centronics to 68-pin External SCSI, 6 ft. **To use the 6 ft. cable, the system must be equipped with an AM-441-00 Wide SCSI Bus Repeater**.

SCSI Diskette Drive

The Eagle 450 supports our new SCSI-interface diskette drive, the AM-212-20, as an optional feature. The drive has a narrow SCSI (50-pin) interface that connects directly to the SCSI bus. No separate controller is required. The drive is somewhat more expensive than the PC-style drives used in most other AMOS-based systems. Elimination of the separate floppy controller, however, yields a lower total cost per system.

Note: Diskette Drive Requires 5.25" Mounting Bay

> Although the AM-212-20 diskette drive is a 3.5" device, the complete assembly, including the mounting adapter for the drive, requires a 5.25" mounting bay in the system chassis.

The AM-212-20 reads and writes 3.5" diskettes in all of the following formats:

- AMOS 720MB 3.5" double density format
- AMOS 1.44MB 3.5" high density format
- PC 720MB 3.5" double density format
- PC 1.44MB 3.5" high density format

The Eagle 450 does not support 5.25" diskettes. The Eagle 450 does not require — or support — the AM-219 Floppy Controller.

Other Installation Considerations

Year 2000 Compliance

When used with the AMOS 2.3A operating system, the Eagle 450 is Year 2000 compliant. For further information about Year 2000 compliance, visit our Web sites at *www.alphamicro.com* or *www.amos-online.com*; or call our Year 2000 Help Desk at (800) 777-7534; or see marketing bulletins entitled *Progress Reports on Year 2000 Compliance*, published by Alpha Microsystems from time to time.

Software

AMOS 2.3A Operating System

The Eagle 450 runs under AMOS 2.3A and later versions of the AMOS operating system. If your application is running under an earlier release and you'd like help in moving to 2.3A, please call the Technical Assistance Center. We're here to help you add still greater value to your application in the Alpha Micro world.

TAME—TCP Management From Inside Your Application

The network software included with AMOS 2.3A includes AlphaTCP 1.4, the latest version of our AMOS-compatible implementation of the TCP/IP protocol family. AlphaTCP 1.4 in turn includes TAME, for **T**CP **A**ccess **M**ade **E**asy. TAME lets you add TCP communication to any AlphaBASIC or AMOS assembly language application. To access TCP from an assembly language program, you use a series of monitor calls. From AlphaBASIC or AlphaBASIC PLUS, you use the new TCP XCALL subroutine.

AlphaTCP 1.4 software and documentation are available on the AlphaCD (December 1997 and later versions). Documentation is also available at our Web site. For details of TAME, see latest revisions of the *AMOS Monitor Calls Manual* and the *AlphaBASIC XCALL Subroutine User's Manual*.

Upgrades

Users of many older Alpha Micro computers can enjoy most benefits of the Eagle 450, at reduced prices, by means of the Eagle 450 Upgrade Program. The program offers field-installable upgrade kits for Eagle 100, 300, and 500 systems, and for the AM-1600.

Upgrade Kits for Eagle 100/300/500 Systems

These upgrades convert an Eagle 100, 300, or 500 system to either of two systems: an Eagle 450 with Wide SCSI or an Eagle 450 with narrow SCSI. Each kit consists of an AM-138 processor board, internal cabling and hardware, and a replacement rear panel for the user's existing deskside Eagle chassis. The AM-138 board contains the entire processor and I/O logic of an Eagle 450. The cabling provides a narrow or Wide SCSI bus, depending on the kit selected. The replacement rear panel provides mounting arrangements for the Eagle 450's port connectors.

Upgrade Kits for AM-1600 Systems

Separate kits are offered for AM-1600 systems in the original desktop chassis and in the Eagle deskside chassis. Desktop kits include a complete, new, Eagle 450 chassis. Kit pricing assumes return of designated parts from the upgraded system. Details appear in the Reseller Supplement.

Benefits of Upgrading

As with any upgrade, benefits depend on site circumstances. Factors include the user's operating system, application, number of users, and peripherals installed. The benefits shown in Table 7 should be considered typical. Note that PCI slot capability is not provided by any upgrade.

Table 7. Potential Benefits of an Eagle 450 Upgrade

	Upgraded System			
Potential Benefits	**Eagle 100**	**Eagle 300**	**Eagle 500**	**AM-1600**
Higher performance: Twice the original SI rating	✔	✔		
Four times the original SI rating				✔
Higher performance: Wide SCSI bus support	✔	✔	✔	✔
Twice as many serial ports	✔			✔
Lightning protection on serial ports	✔	✔	✔	✔
More maximum memory: 4 ✕ (64MB to 256MB)	✔			
8 ✕ (32MB to 256MB)		✔	✔	
Much more memory				✔
Substantially higher Ethernet throughput	✔		✔	✔
Mounting space for more peripherals				✔

System Performance

Performance of the Eagle 450, like that of any computer, is application dependent. The best way to determine actual throughput is to run an application and measure the results. If such a test isn't practical, benchmarks can provide a relative measurement.

The benchmarks in this bulletin are offered for general comparison analysis and example only. For definitive measurements, VARs and end users should verify actual performance based upon their specific applications and environments. The benchmarks we use give an overall indication of system throughput. It's important to note that the way your application software uses the system may produce results different from those suggested by our benchmarks.

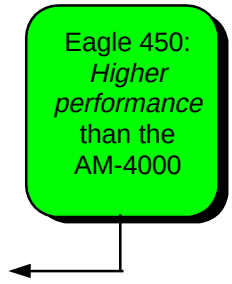
System Index (SI)

The SI benchmark measures processor and memory performance in the AMOS environment. The measure is relative to the original WDC-based Alpha Micro computer, the AM-100, which was arbitrarily assigned an SI of 1. See the table below; bigger numbers are better.

Keep in mind that the SI reflects processor speed only, not overall system performance as users will experience it. Factors such as disk accessing and the effect of multiple users are not measured. For a more comprehensive view, see the DOABEN benchmark on the next page.

System Index (SI) Benchmark Results for Various Alpha Micro Systems

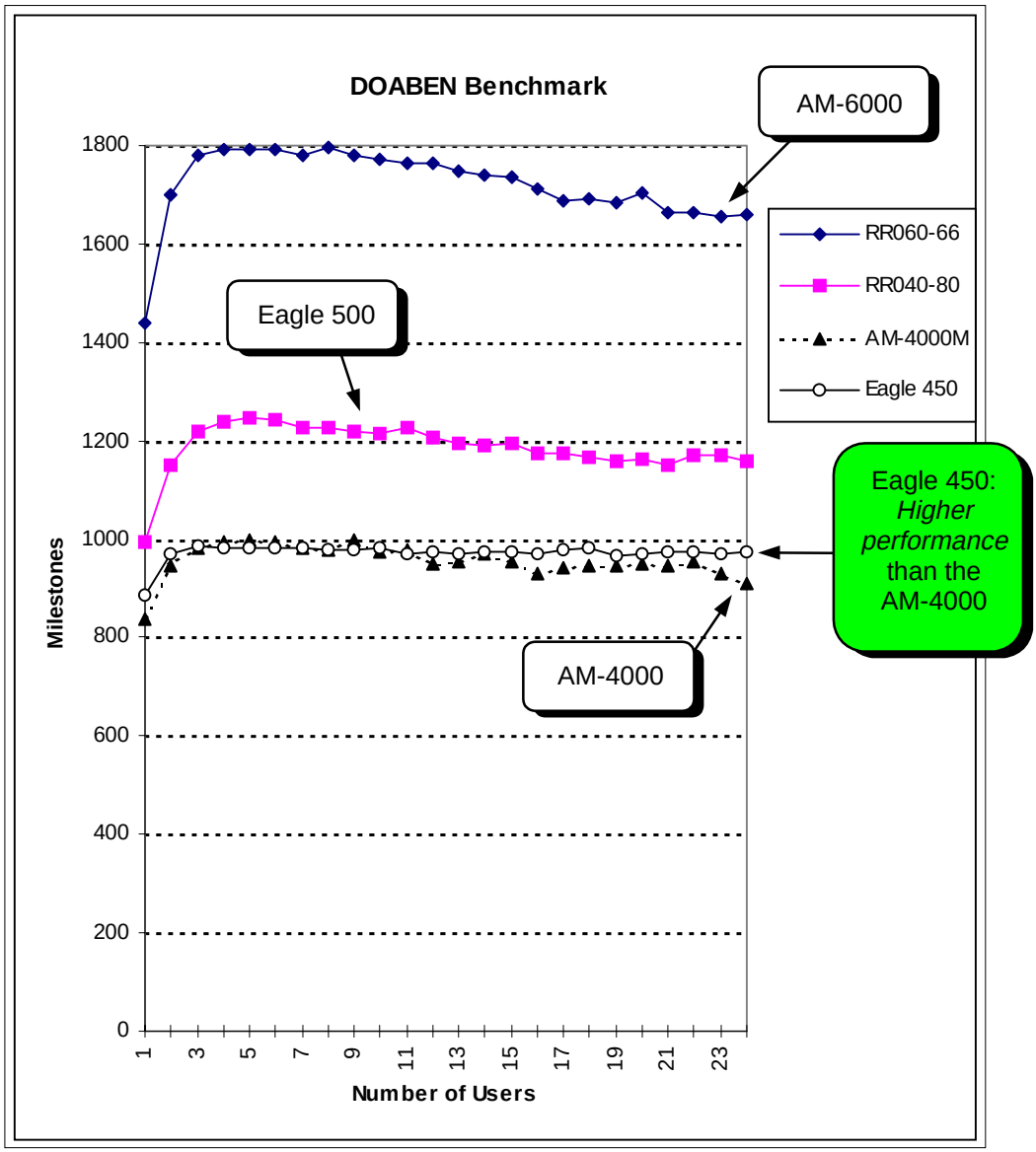
System Model	CPU	*SI* Compute Index
AM-100	WDC	1
AM-1400	68010	6.1
AM-1600	68020	22.6
Falcon/AM-PC	68340	16.1
Eagle 100	68030	39.1
Eagle 300	68030	39.1
AM-3000 VME	68030	43.6
AM-4000M	68040	66.1
Eagle 450	**ColdFire**	**68.5**
Eagle 500	68040	79.9
Super Eagle	68040	79.9
AM-6000/6060	68060	137.0



DOABEN Performance

DOABEN (**do a ben**chmark) is a suite of tests that measure multi-user throughput on Alpha Micro computer systems. Performance is measured in units called Milestones, which represent the number of tasks that can be done in a certain period of time for a prescribed number of users. Programs in the DOABEN suite exercise the system by cycling through functions such as database access, program loading, and CPU usage. The chart below shows the results of DOABEN testing on the Eagle 450 and three high-end systems: the AM-6000, Eagle 500, and AM-4000. Notice the superiority of the Eagle 450 over the AM-4000, a much larger and more expensive system.

DOABEN Comparison: Eagle 450 versus High-end Systems



The Bottom Line

The Eagle 450 is an all-around standout: in technology, in features, in price/performance, and in compatibility with today's AMOS sites and systems. It's also a long-term profit builder for Alpha Micro resellers, with upgrade potential for years to come.

Eagle 450 shipments will begin soon. Stay in touch with your Order Administrator for the latest schedule. Information about the Eagle 450 will also be available on our all-AMOS Web site, *www.amos-online.com.*

In the best traditions of Alpha Microsystems and the AMOS community, welcome to the Eagle 450!

Best regards,

John F.G. Leighton
VAR Marketing Manager