

AMB2008-01

January 18, 2008

Announcing the AM-8000™ Series III

Alpha Micro's Premier Server Upgraded With A New CPU and Disk Interface

Dear Alpha Micro Dealer:

As microprocessor technology continues to evolve, Alpha Micro is pleased to announce a new version of our top-of-the-line AM-8000 server system. Incorporating the very latest technology in a number of areas, the new AM-8000 Series III advances the state of the art of AMOS™ systems and achieves speeds never before seen.

The Series III transitions the AM-8000 product line into AMD's new "Socket F" processor family. It is based on AMD's currently fastest clock rate processor, the 64-bit, dual core *Opteron® 2224 SE*.



AM-8000 Series III Server

As Much As 80% Faster Than The Original AM-8000 Series I

The Series III beats the original AM-8000 in CPU Speed, Floating Point, and especially in cached Disk I/O. And take a look at this: **The Disk SI test which yields 39 on an AM-7000, 2167 on the AM-8000 Series I, and 3716 on the Series II, now yields 3902 on the Series III.** This is a result of AMD's unique on-chip memory controller architecture coupled with DDR2 RAM.

Faster RAM Included; Twice the Capacity

To complement the Opteron 2224 SE's faster memory controller architecture, the AM-8000 Series III comes standard with **2 GB** of PC2-5300/DDR2 667 Registered ECC RAM, some of the fastest DRAM available today. In comparison, the Series II used PC2700/DDR 333 RAM. The new Opteron 2224 SE CPU's built-in DDR2 memory controller is able to read from, and write to, the new RAM faster than the Series II, albeit not quite at twice the speed that the part numbers would indicate.

AMOS users will perceive this increased RAM speed primarily as increased disk throughput, as cached disk blocks in RAM will be accessed much quicker. As a result, to provide a high level of disk performance, we have decided to double the amount of RAM supplied standard in the Series III versus the Series II.

SAS: Today's Fastest Disk Drive Interface Technology

The AM-8000 Series III includes the latest in disk drive connectivity: Serial Attached SCSI, or SAS. An evolved form of the parallel SCSI that we are all accustomed to, SAS offers faster throughput, and simplified cabling. Forget about touchy cables and issues of Termination and Termination Power. Each SAS drive connects directly to the motherboard via its own cable.

And every SAS cable is an independent channel. No more worrying about how many devices to place on SCSI Channel A versus Channel B for maximum data throughput. *Each device always operates at maximum throughput by virtue of its independent connection to the SAS controller.* The AM-8000 Series III includes 8 SAS ports, which should meet the majority of AMOS users' requirements.

The Fastest Disk Drive on the Market – At Double The Capacity

We didn't just include the fastest interface; *we are including the fastest disk drive made*, which just happens to be available only with an SAS interface. The Seagate Savvio has been tested by StorageReview.com as the speediest drive ever. Interestingly, it is only a 2.5" drive – notebook sized. No longer does small mean slow – this drive beats out all of its 3.5" brethren in performance.

This drive also has a 73 GB capacity, double that of the drive we had been shipping with the Series III. For most present AMOS users, 73 GB is an almost unfathomable amount of storage.

Blu-ray Drive Standard

Every Series III AM-8000 includes a Blu-ray disc drive for backup. This leading-edge optical drive was made available for AMOS recently, and deserves a rightful position as the best available backup technology in our premier server. It is backward-compatible with DVD-RAM and CD formats, for compatibility with your existing backups. Disc media is available in 25 GB and 50 GB capacities. See our previous Marketing Bulletin AMB2007-08 for complete details of this new kind of drive.

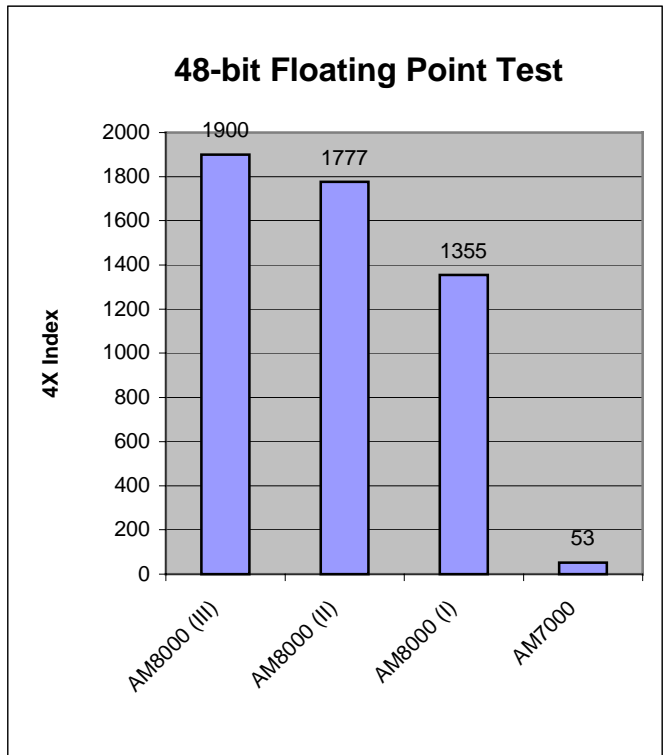
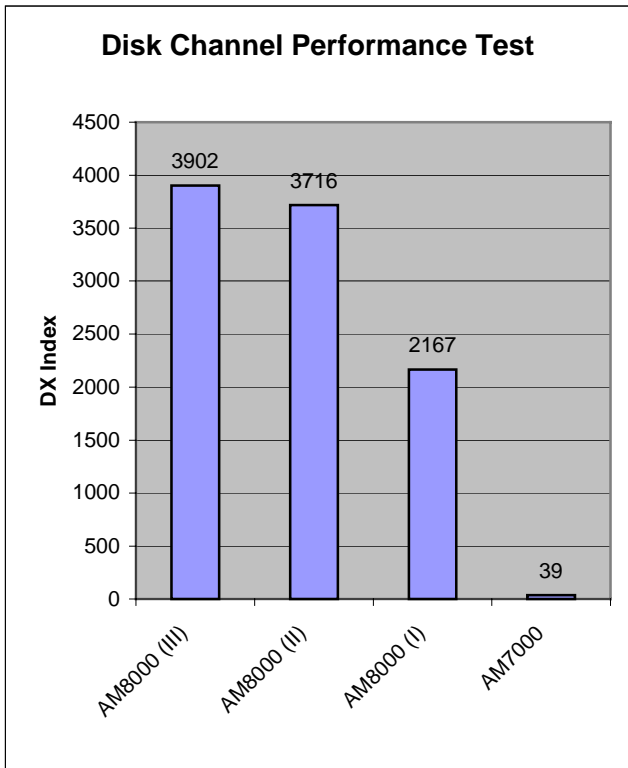
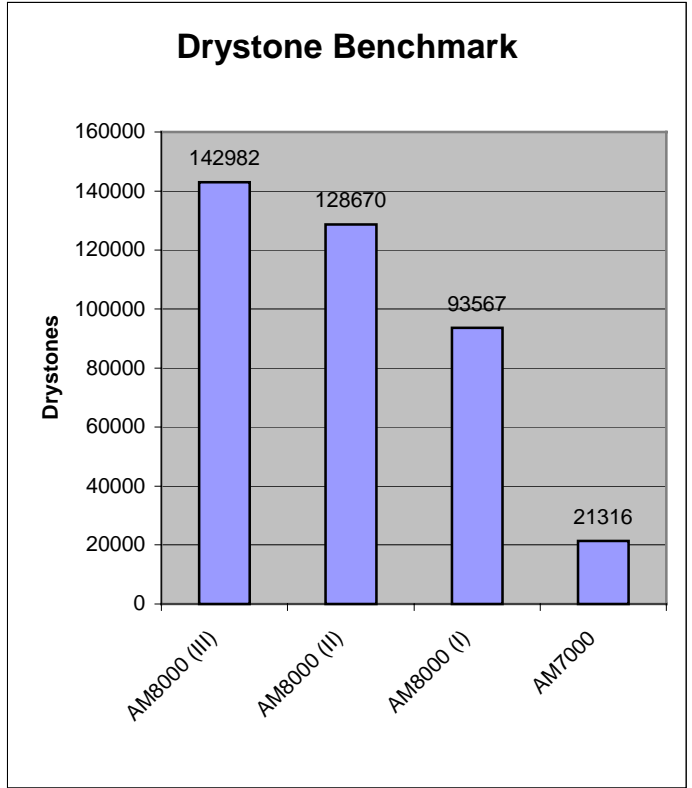
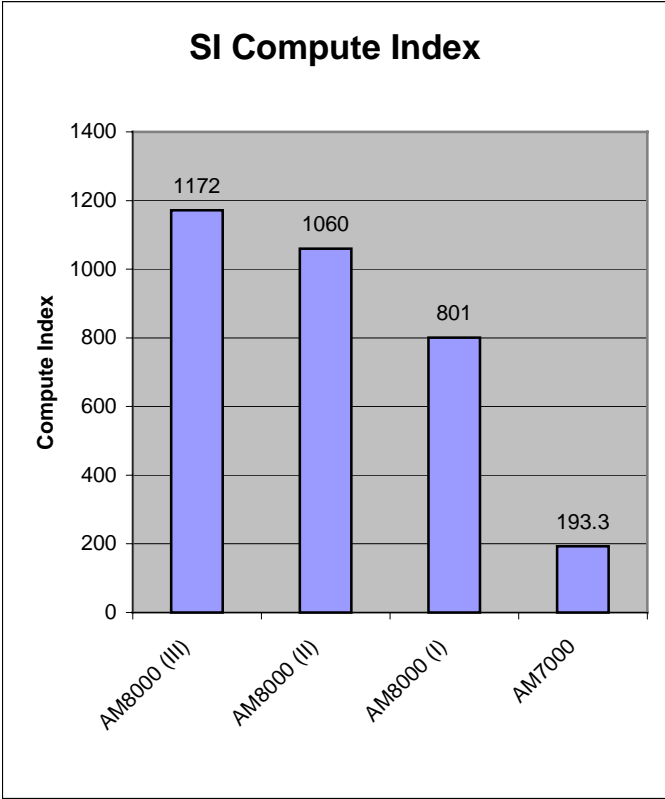
A PIC for Alpha Micro's new MAKBD backup software is included with the AM-8000 Series III, assuring the maximum possible utilization of the Blu-ray media's capacity.

Parallel SCSI Available As An Option

With the introduction of the AM-8000 Series III, Alpha Micro is taking the position that Parallel SCSI, in the familiar forms of Narrow SCSI, Wide SCSI, UltraWide SCSI, and Ultra320 SCSI, is a sunseting technology. The market is one indication: Not one motherboard that incorporates an SAS interface also includes a SCSI interface. All new high-end disk drives are being introduced with an SAS interface; a decreasing number offer an Ultra320 SCSI interface as an option.

AM-8000 Series III Benchmark Results

For more details, see pages 8-10 of the attached "AM-8000 Series III Introduced" section.



Nevertheless, we realize that there are many reasons to support SCSI. The initial installation of an AM-8000 Series III will likely require attaching a SCSI disk or tape drive for restoral onto the new SAS disk drive. Existing tape and disk drives, and RAID units, utilize SCSI interfaces; they may be of use on the new Series III. And proven, reliable streaming tape drives do have a role in our systems, even if they aren't exactly cutting edge. After all, reliability is more important than modernity when you have to restore from a backup. We are therefore making available three SCSI controllers to suit varying needs:

- **The AM-283-30 Dual Channel Ultra320 PCI-X SCSI Controller:** This high-end, dual channel, 64-bit controller is ideal for connecting production disk drives and RAID units. *It provides the fastest possible SCSI interface for the Series III.*
- **The AM-283-40 Ultra320 PCI-X SCSI Controller:** This entry-level PCI-X SCSI controller is the right choice for connecting a DAT or streaming tape drive for production use. If you have no production SCSI disk drives to connect, and only tape drive(s), choose this board.
- **The AM-922 USB-to-SCSI Adapter:** This recently introduced device belongs in every AMOS dealer's toolkit, as a relatively slow but convenient method of attaching SCSI devices. While suitable for long-term connectivity of tape drives, especially external units, the AM-922 is especially suited for short-term, temporary attachment of disk and tape drives during the initial system installation.

Six Serial Ports Standard

There are 2 COM ports on the AM-8000 Series III motherboard, and 4 "Alpha Micro style" serial ports on the AM-113 card, the same as with previous AM-8000 models. There is no onboard parallel port.

Additional serial ports are supported either via AM-359 cards attached to the AM-113 card, or via extra COM ports attached via the AM-131-16 16 port USB-to-COM port adapter.

Up to 15 AM-359 cards may be attached to an AM-8000 Series III, for a total of up to 120 ports. Including the four AM-113 ports and up to 18 COM ports, the Series III can accommodate a maximum of 142 serial ports.

Dual Gigabit Ethernet Interfaces

As high-end networks now consider Gigabit Ethernet standard fare, the AM-8000 Series III sports two Gigabit Ethernet ports for maximum throughput. Heavy FTP, e-mail, or web serving duties will benefit from this technology.

One IDE and Six SATA 3.0 Gbit/sec. Ports

A traditional IDE interface offers up to 133 megabytes per second throughput. The SATA 1.5 Gbit/sec. interface, informally known as "SATA-1", offers throughput up to 150 MB/sec. The newer SATA 3.0 Gbit/sec., or "SATA-2", interface offered on the Series III AM-8000 is capable of up to 300 MB/sec.

The Blu-ray drive and certain special-purpose drives make use of the industry standard IDE and SATA interfaces present on the Series III.

USB 2.0 – Finally!

Unlike previous AM-8000 motherboards, the Series III's USB ports are version 2.0, assuring support of high speed peripherals.

PCI Expansion

Three 64-bit PCI-X slots and two PCI Express slots support the addition of SCSI and COM port expansion cards. Note: The one 32-bit PCI slot on the motherboard is occupied by the AM-113-50 card.

Updated, Dual-Purpose Chassis

As with recent builds of the Series II, the AM-8000 Series III is delivered in a universal chassis that may be used for tower or rack mounting. A rack mount kit is optionally available to assist in proper installation in a rack.

LightningBASIC™ Standard

All AM-8000 Series III systems, both upgrades and systems with new AMOS licenses, include a PIC Code for LightningBASIC, our native x86 AlphaBASIC™ runtime environment.

TrueGUI™ Standard with New Systems

New AM-8000 Series III system orders, that is those that are not upgrades from older Alpha Micro systems, include *TrueGUI* licenses equal in number to the number of AMOS ports being purchased. This offer is only valid at initial system order time; subsequent port increments to AMOS do not qualify for additional free *TrueGUI* licenses. Start your new clients off with a GUI view of your application!

FCC and RoHS Certified

Alpha Micro takes its certification responsibilities seriously. Our new systems meet FCC standards for radio frequency emissions. They also meet the new European RoHS and similar California regulations for hazardous material content.

Upgrades From Existing Alpha Micro Systems

Trade-ins are available from earlier AM-8000 models and other Alpha Micro systems. The attached Reseller Supplement contains the details of our trade-in programs.

“Test Drive” Program Continues: Now Four Weeks Long!

A limited number of AM-8000 Series III systems are available for free evaluations. At the request of several of our dealers, we are extending the test drive period from two to four weeks. If

your client elects to keep the system, payment in full is due when the four week Test Drive period concludes.

Obviously, Alpha Micro believes there is little risk in this kind of arrangement – the additional performance of our newer generation systems sells itself. Let our confidence become your confidence: Put a Series III in front of your customers soon!

AM-8000 Series II Still Available

The AM-8000 Series II will remain available for the short term, as long as demand exists and the major components can still be sourced. Spare parts will remain available when the Series II is eventually discontinued.

AM-8000 Series I Discontinued

The original AM-8000's components have been discontinued and are therefore not available to be built into new systems. As a result, we are discontinuing this product. Spare parts continue to be available.

Improved Technology – Same Price

With the AM-8000 Series III, Alpha Micro continues its commitment to deliver a top end server based on the best current technologies, to meet increasing demands on system resources. Best of all, this improved AM-8000 is available at no increase in price over the present Series II.

AM-8000 Series III systems are available for immediate shipment.

**FOR FURTHER TECHNICAL DETAILS ON THE
AM-8000 SERIES III, SEE THE INFORMATION PACKAGE,
ATTACHED TO THE END OF THIS MARKETING
BULLETIN**

AM-8000

Series III

Information Package

Table of Contents

<i>Introducing the AM-8000 Series III</i>	1
Product Overview	1
Architecture	1
Advanced Technology	1
AM-8000 Series III Product Description.....	4
Chassis	4
Main Memory	4
System Disk Drive	4
Blu-ray Drive	4
Serial I/O.....	5
PC and AM-82 Thin Client Workstations on the AM-8000.....	7
SAS and SCSI Support	7
SAS and SCSI Devices for the AM-8000.....	7
SAS and SCSI Disk Drives.....	7
SCSI Tape Drives	8
AM-448 RAID Subsystem.....	8
Software.....	8
AMOS Operating System	8
System Performance	8
System Index (SI)	8
DOABEN Benchmark	9
Dhrystone Benchmark	10
Hoffmeister Benchmark.....	11

Introducing the AM-8000 Series III

Product Overview

Table 1 highlights the technology features that place the AM-8000 Series III at the top of the AMOS product family. Compared to other family members, the AM-8000 system family's most distinctive feature is performance. A CPU SI:CX (System Index:Compute Index) rating of 1172 alone positions the AM-8000 Series III ahead of the Series II by 10.5%, and 46% ahead of the Series I, and far ahead of any prior Alpha Micro computer, with a 600+% lead over the AM-7000. Note that overall throughput is application dependent.

Architecture

The AM-8000 Series III is a leap forward in the AM-8000 product family. The hardware is built around the fastest Opteron 64-bit processor currently available, extending the performance of the existing high end of our product line. The system is housed a versatile pedestal style chassis which can easily be configured into a 5U rack mountable unit, the same chassis our latest AM-8000 Series II systems are housed in.

The system configuration is expanded via industry standard technologies. Three PCI-X slots and two PCI Express slots are included to accommodate special function boards, such as high speed serial I/O controllers and parallel SCSI controllers to allow maximum flexibility in system configuration and expansion.

The standard system configuration also includes a Blu-ray drive, 17" flat screen monitor, keyboard, and mouse.

The system chassis has plenty of room for future expansion. The AM-8000 Series III houses the standard Blu-ray and first hard disk drives, and up to 8 additional 5.25"/3.5" peripherals. A total of ten peripheral bays (five 5.25" exposed and five 3.5" hidden), are included in the system, mounted with slide-in rails and secured behind a lockable front door.

Advanced Technology

The AM-8000 leverages leading-edge technology in several areas:

Microprocessor technology — The AM-8000 incorporates an AMD Opteron 2224 SE dual-core microprocessor chip, the top performing chip in the Opteron two-way, dual-core processor line. Optionally, a second Opteron 2224 SE microprocessor can be added to the system.

DIMM main memory — The AM-8000 Series III CPU Board has eight on-board DIMM (dual inline memory module) expansion slots for each microprocessor, which support PC2-5300 DDR2 Registered ECC RAM modules. Memory capacities from 2 GB to 64 GB are supported.

Serial Attached SCSI (SAS) — Eight SAS ports are provided in the AM-8000 Series III. These ports are used primarily to interface to high capacity SAS disk drives, one of which is included in the standard system configuration.

Ultra320 SCSI (Optional) — Two PCI-X Ultra320 SCSI controller boards are available if high speed Parallel SCSI is desired. This optional high speed SCSI bus can be configured to communicate exclusively with high speed wide SCSI disk drives and/or backup devices and other SCSI peripherals (both internal and external).

Gigabit Ethernet — Two Gigabit Ethernet interfaces are provided to maximize both performance and flexibility. These interfaces support 10 Mbps, 100 Mbps, and 1000 Mbps transfer rates, allowing you to configure your network architecture to meet the needs of your application.

Table 1. AMOS Product Line

	Mid- to High-range AMOS-based Systems					
	Super Eagle	AM-6000	AM-7000	AM-8000 (Series I)	AM-8000 (Series II)	AM-8000 (Series III)
System						
Processor Board	Roadrunner 040	Roadrunner 060	Roadrunner 75	Dual Athlon PCI bus	Dual Opteron PCI bus	Dual Opteron PCI-X bus
Performance: SI	79.9	146.3	193.3	801	937	1172
CPU Main Processor	MC68040 (Motorola)	MC68060 (Motorola)	MC68060-75 (Motorola)	Dual Athlon 2800+ MPs (AMD)	Opteron 252 (AMD)	Opteron 2224 SE (AMD)
On chip (L1) Cache	8KB	16KB	16KB	128KB	64KB	128KB
L2 Cache	32KB	64KB	128KB	512KB	1 MB	2 MB
Memory: min./max.	4MB/64MB	8MB/256MB	32MB/512MB	1GB /4GB	1GB /4GB	2GB /64GB
Memory technology	DRAM	DRAM	EDO RAM	PC2100 DDR ECC RAM	PC3200 DDR ECC RAM	PC2-5300 DDR2 ECC RAM
Input/Output						
Separate I/O Processor	None	None	None	ColdFire RISC	ColdFire RISC	ColdFire RISC
Serial ports, standard	4	4	4	6 (2 non-RISC)	6 (2 non-RISC)	6 (2 non-RISC)
Serial ports, maximum	200+	200+	200+	240+*	120+	120+
I/O Expansion Cards	AM-359	AM-359	AM-359	AM-359	AM-359	AM-359
Parallel Ports	4	4	4	1	1	1
Terminal Servers	Optional AMOS Terminal Servers provide additional serial and parallel I/O					
Networking						
Ethernet ports: min/max	1	2	2	2	2	2
10BaseT port	Standard	Standard	Standard	Standard	Standard	Standard
100BaseT port	Not available	Optional	Standard	Standard	Standard	Standard
Gigabit Ethernet port	Not available	Not available	Not available	Standard	Standard	Standard
Fax Send/Receive	Optional AlphaFAX 2.1 Plus software provides comprehensive fax management facilities					
SCSI Support						
SCSI Bus technology	8-bit	8- or 16-bit	8- or 16-bit Ultra40	8-, 16-bit Ultra320	8-, 16-bit Ultra320	Serial Attached SCSI standard Optional 16-bit Ultra320 via add-in card
Maximum SCSI transfer rate	10MB/sec	20MB/sec	40MB/sec	320MB/sec	320MB/sec	3.0 Gbit/sec

*Over 120 AM-359 serial ports requires an optional second I/O processor.

AM-8000 Series III Product Description

Chassis

The AM-8000 Series III is furnished in the same popular desktop chassis as the current AM-8000 Series II, with the following features:

- Sleek styling, with modern black color in standard pedestal configuration.
- Easily reconfigured to 5U rack mountable configuration with low cost optional rack mount kit.
- Ten peripheral bays (five 5.25" exposed and five 3.5" hidden), mounted with slide-in rails and secured behind a lockable front door.
- Black peripherals (monitor, keyboard, mouse, Blu-ray drive, streamer) will be provided to maintain consistent system appearance.
- **Dimensions**—16.8" high x 8.7" wide x 23.6" deep (42.7 cm x 22 cm x 60 cm)
- **Power requirement**—5 amp @ 115VAC; 2.5 amp @ 230VAC

Main Memory

Main memory for the AM-8000 Series III is implemented in high-speed Registered ECC PC2-5300 DDR2 RAM, packaged in DIMM modules on the AM-8000 main CPU board. The system supports a minimum of 2GB and a maximum of 64GB. 2GB is included as standard with every AM-8000. DIMMs are currently offered in capacities of 512MB and 1GB each, identified by new part numbers PFB-00724-XX.

The AM-8000 Series III main CPU board is equipped with eight DIMM sockets for each Opteron processor. Always install memory in order, starting with DIMM socket 0 (closest to the corresponding Opteron processor on the board). When adding a second Opteron processor in the AM-8000 Series III system, you must add additional memory for that processor.

System Disk Drive

The AM-8000 Series III includes the fastest drive currently on the market, the Seagate Savvio 73 GB SAS drive. This 2.5" drive is faster and consumes less power than the previous 3.5" disk drives.

Blu-ray Drive

The new Blu-ray drive is now standard in every Series III AM-8000 for backup. It is backward-compatible with DVD-RAM and CD formats, for compatibility with your existing backups. Disc media is available in 25 GB and 50 GB capacities. See our previous Marketing Bulletin AMB2007-08 for complete details on this new kind of drive.

Alpha Micro's new MAKBD backup software is included with the AM-8000 Series III, assuring the maximum possible utilization of the Blu-ray media's capacity.

Serial I/O

The AM-8000 Series III comes with six serial I/O ports as standard. The ports appear as four RJ-45 jacks and two PC style DB-9M connectors on the rear of the AM-8000 system. Additional serial ports are optional and can be implemented in a variety of ways. One way is to externally install AM-359 cards in a Serial I/O chassis like the AM-905-31 or AM-3501 chassis, and cable the AM-8000 system to the external I/O chassis. Another is to connect a terminal server via an Ethernet connection to the AM-8000. A third way is to install up to 16 additional COM ports via 4 or 8 port 32-bit PCI-X cards, or via a 16 port USB to Serial adapter.

Up to 15 AM-359 cards (8 serial I/O ports each) can be externally connected to the I/O processor board within the AM-8000 for a total of 120 additional serial I/O ports. For details see Table 2, **AM-8000 Series III Serial I/O Options**.

Table 2. AM-8000 Series III Serial I/O Options

Line No.	Configuration Details	I/O Cards	Total Serial Ports
101	Maximum Ports Inside AM-8000 System		
102	Standard serial ports in AM-8000 system ①		2
103	Additional AM-113-50 Serial I/O Controller (4 on-board RJ-45 ports) ①		4
104	Additional PFB-00131-58 PCI Serial I/O Controller (8 on-board DB-9 ports per board) ②		16
105	Total serial ports inside AM-8000 system		22
106	Maximum Ports with external AM-3501 Expansion Subsystem ③		
107	Standard serial ports on AM-8000		22
108	AM-359 cards in AM-3501	7 AM-359 cards	56
109	Total serial ports: AM-8000 + AM-3501		78
110	Maximum Ports with external AM-905-31 I/O Expansion Chassis ③		
111	Standard serial ports on AM-8000		22
112	AM-359 cards in AM-905-31	15 AM-359 cards	120
113	Total ports: chassis + AM-905-31④		142



Line numbers are for reference during telephone conversations and have no other significance.

- ① The AM-8000 desktide mini-chassis contains one AM-113-50 as standard. This board includes four on board serial I/O ports (RJ-45) and the ability to externally drive up to 15 AM-359 paddle cards housed in either an AM-3501 or AM-905-31 I/O subsystem chassis. Two standard DB-9 serial I/O ports are also included in the AM-8000, for a total of six serial I/O ports in the base configuration.
- ② Assuming 2 PCI-X slots are available for the PFB-00131-58 boards. A maximum of 18 COM ports is supported , including the two on the motherboard.
- ③ See Section I of the *AMOS Products Price List* for details of the AM-3501 and AM-905.
- ④ The maximum physically-installable AM-8000 Series III configuration is 142 serial ports (including 2 32-bit PCI slots).

PC and AM-82 Thin Client Workstations on the AM-8000

PC workstations can connect to the AM-8000 serially or, more often, via Ethernet. Connection is supported by popular terminal software such as AlphaLAN⁺⁺, STEP⁺⁺, and ZTERM.

The AM-82 Thin Client is a small footprint, diskless PC that boots up directly into AlphaLAN. It supports Ethernet as well as serial connections. It offers the benefits of a full PC with lower cost of ownership, because it needs virtually no administration once set up.

In addition to the convenience of remote access, these workstations can enhance system performance. That's because, generally speaking, an Alpha Micro computer is more efficient in processing data for Telnet sessions than for serial connections. We've run benchmark tests to prove it. Our tests show the following:

1. For a given level of throughput, an Alpha Micro computer will support more users on a network than it will using serial terminals.
2. When you add users, an Alpha Micro computer will handle the increased load much more efficiently if the users are on Telnet connections. Throughput per user on Telnet sessions remains relatively constant as the load increases. On serial connections, throughput per user declines rapidly.

SAS and SCSI Support

The AM-8000 Series III incorporate eight Serial Attached SCSI (SAS) ports for attaching high speed SAS hard disk drives.

In addition, PCI-X Parallel SCSI controllers are optionally available for attaching traditional Narrow and Wide SCSI peripherals such as tape drives and disk drives.

SAS and SCSI Devices for the AM-8000

A wide choice of disks, tapes, and other SAS and SCSI devices helps tailor the AM-8000 to specific site requirements. An AM-8000 supports up to eight SAS or SCSI devices mounted inside the chassis (internal devices). To maximize the overall performance of the AM-8000, the highest speed SAS or Wide SCSI disk drives and/or RAID subsystems should be included in your system configuration.

SAS and SCSI Disk Drives

The AM-8000 Series III uses high speed SAS disk drives as the standard system disk. It attaches to one of the eight SAS ports contained in the system.

The AM-8000 Series III can also support all Fast-Wide SCSI-2 and Ultra SCSI drives (PDB-00440-XX) used in previous AM-8000 systems using an optional PCI-X Parallel SCSI controller.

SCSI Tape Drives

The AM-8000 supports all current SCSI tape drives attached to an optional PCI-X Parallel SCSI controller.

AM-448 RAID Subsystem

For AM-8000 installations that require large, highly reliable mass storage, specify our AM-448 RAID Subsystem. Configurations start as small as 80GB of usable storage with RAID 1 (mirroring). The subsystem can be expanded to over 280GB of RAID 5 storage in the same desktop enclosure. The RAID subsystems are UltraWide SCSI with 160 megabyte-per-second transfer rate. The AM-448 includes facilities for system installers and support managers to:

- Configure the AM-448 with hot spare disk drives for on-site support.
- Configure the AM-448 as a bootable SCSI device; the subsystem can coexist with other wide SCSI disk drives in the same AM-8000.

For more information see Marketing Bulletin AMB2002-11, *New RAID Subsystems Announced*, October 28, 2002.

Software

AMOS Operating System

AM-8000 Series III systems require AMOS 8.1 or later.

System Performance

Performance of the AM-8000 Series III, 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 68000-based Alpha Micro computer, the AM-100/L, which was arbitrarily assigned an SI of 1. See Table 3 below, and the graph at the beginning of this bulletin; bigger numbers are better.

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

Table 3. AMOS System Performance Comparison Chart

————— Performance Tests —————

System Model	CPU	SI	DRY Dhrystone Benchmark	SI:DX Disk Channel	SI:4X 48-bit Math
AM-100/L	68000	1.0			
AM-1400	68010	6.1			
AM-1600	68020	22.6			
Falcon/AM-PC	68340	16.1			
SuperFalcon/AM-PC	ColdFire	150			
AM-2000M (33 MHz)	68020	28.0			
Eagle 100	68030	39.1			
Eagle 250	ColdFire	61.1	10281	14.6	24.5
Eagle 300	68030	34.9	6509	15.3	34.3
AM-3000 VME	68030	43.6			
AM-4000M	68040	66.1			
Eagle 450	ColdFire	69.5	11293	14.8	30.0
Eagle 500	68040	79.9			
Super Eagle	68040	79.9			
Eagle 750 (w/ Cardinal)	Sempron	150			
AM-6000/6060	68060	146.3	15531	21.0	39.7
AM-7000	68060-75	193.3	21316	39.0	53.3
AM-8000	Dual Athlon MP-2800+	808	93567	2001	1355
AM-8000 Series II	Opteron 252	937	113882	3251	1511
AM-8000 Series III	Opteron 2224SE	1172	142982	3902	1900

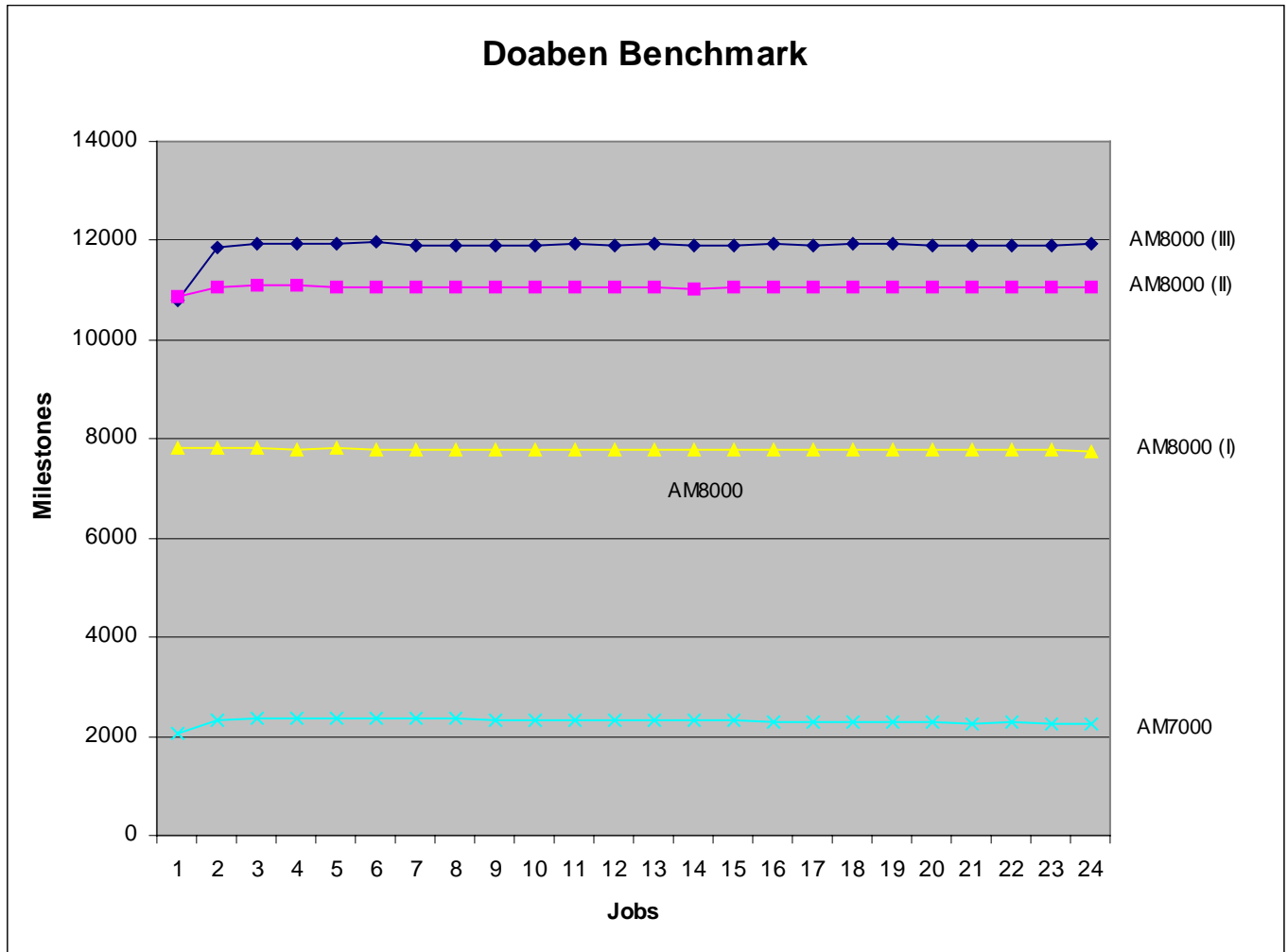
DOABEN Benchmark

DOABEN (**do a benchmark**) 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 results of DOABEN testing on the AM-8000 Series I, Series II, Series III and three other high-end systems: the AM-7000, the AM-6000, and the Eagle 450 are shown in Figure 3.

- **80% faster than an AM-8000 Series I** — The AM-8000 Series III sets the record for DOABEN performance.
- **More than 5 times faster than the AM-7000** — and of course, further ahead of the older high end systems.

Figure 3. DOABEN Comparison — AM-8000 Series III versus AM-8000, AM-7000, etc



Dhrystone Benchmark

The Dhrystone benchmark is a widely used measure of CPU performance. The Dhrystone algorithm is written in the C programming language and performs a variety of tasks including manipulating strings and arrays, and handling integer math and subroutines. While the Dhrystone test measures CPU performance only, and not disk activity or other system loading, it does provide a useful comparison of one processor with another.

Our Dhrystone tests of the AM-8000 Series I, Series II, and Series III gave these results (bigger is better):

- AM-8000 Series I: 93567 Dhrystones per second
- AM-8000 Series II : 113882 Dhrystones per second
- AM-8000 Series III : 142982 Dhrystones per second

The AM-8000 Series III outperformed the AM-8000 Series II by about 26%. See the Dhrystone comparison information in Table 3 on page 9 of this section, and the graph at the beginning of this Marketing bulletin for further comparisons.

The Hoffmeister Benchmark

Past benchmark data has included a real-world application written entirely in AlphaBASIC and ISAM, known as the Hoffmeister Benchmark. However, since the current systems perform so much faster than systems available during the time the benchmark was written, this benchmark has become obsolete and will no longer be used to compare systems in the current product line.