

AMB2011-02

February 9, 2011

Introducing the Eagle 900™

*Improved Technology For Midrange AMOS™ Server Users
New Alpha Micro Disk Cache Software Provides Dramatic Performance Gains*

Dear Alpha Micro Dealer:

In conjunction with the introduction of our new flagship AM-9000™ server, Alpha Micro is pleased to announce its sister, the Eagle 900, our new server designed for mid-sized AMOS environments. The Eagle 900 brings many of the AM-9000's technology and performance advancements to our most popular series of servers.

Up to 89% Faster Than the Eagle 800 Series I

The best part about a new Alpha Micro server is always improved performance over its predecessors. This time the numbers are nothing short of breathtaking. Refer to the benchmarks on subsequent pages to see how the new systems compare against the Eagle 800™ systems.

Faster CPU and Motherboard

It goes without saying that the Eagle 900 is built around an improved CPU, the 64-bit, 3.0 Ghz., three-core AMD Athlon II® X3 440 processor, on an integrated Socket AM3 motherboard.

SATA 3.0 Disk Interface

The disk interface channel is a key controlling factor of system performance. The Eagle 900 includes the latest and fastest iteration of the SATA interface, SATA 3.0, which offers throughput of **6 Gbits/sec.** This is double the 3 Gbits/sec. throughput of the previous SATA 2.0 implementation used in the Eagle 800 Series III, and six times the throughput of the IDE interface used on the Eagle 800 Series I and II.



SATA 6.0 Gbit/sec. Disk Drive – Quadruple the Capacity

The Eagle 900 includes a SATA 3.0 hard disk drive, providing a major jump in disk performance. The disk drive, with a capacity of 640 GB – four times the capacity of the drive in the Eagle 800 Series III, is currently the fastest SATA hard drive on the market.

Faster RAM – Double The Amount

The Eagle 900 employs DDR3-1333 RAM, which offers 1.667 times the transfer rate of the DDR2-800 memory used on the Eagle 800 Series III, and *four times* the speed of the DDR-333 memory used in the Eagle 800 Series I. RAM speed is actually improving at a faster rate than raw CPU clock speed nowadays and is one of the main reasons modern systems perform so much faster than their predecessors. Perhaps most notably, because cached disk I/O is actually performed to and from RAM, the faster the RAM, the faster the disk performance.

The Eagle 900 includes 2 GB of RAM, double the amount provided on Eagle 800 systems. On the Eagle 900, the RAM is provided in the form of two 1 GB DIMMs, as the motherboard provides higher performance when two DIMMs are used.

A Faster, More Capable Multi-Function I/O Board

Integrated circuit technology continues to evolve at an amazing pace. The AM-9000 incorporates a new generation I/O and SSD card for AMOS, which is built around a new, fast programmable I/O controller chip.

SSD chip performance has been dramatically improved: Applications which call the SSD frequently, such as BASCPP compiles in Metropolis™, will run substantially faster as a result.

Four “Alpha Micro style” serial ports are built onto the AM-113-24, with a new twist: *Each serial port is accessible by Windows as well as by AMOS!* You can also convert your serial printers to “COM Port Printers” and save yourself the cost of AMOS port licenses for those printers, as Alpha Micro does not currently count serial ports TRMDEF’d using PCLPT towards the AMOS port count.

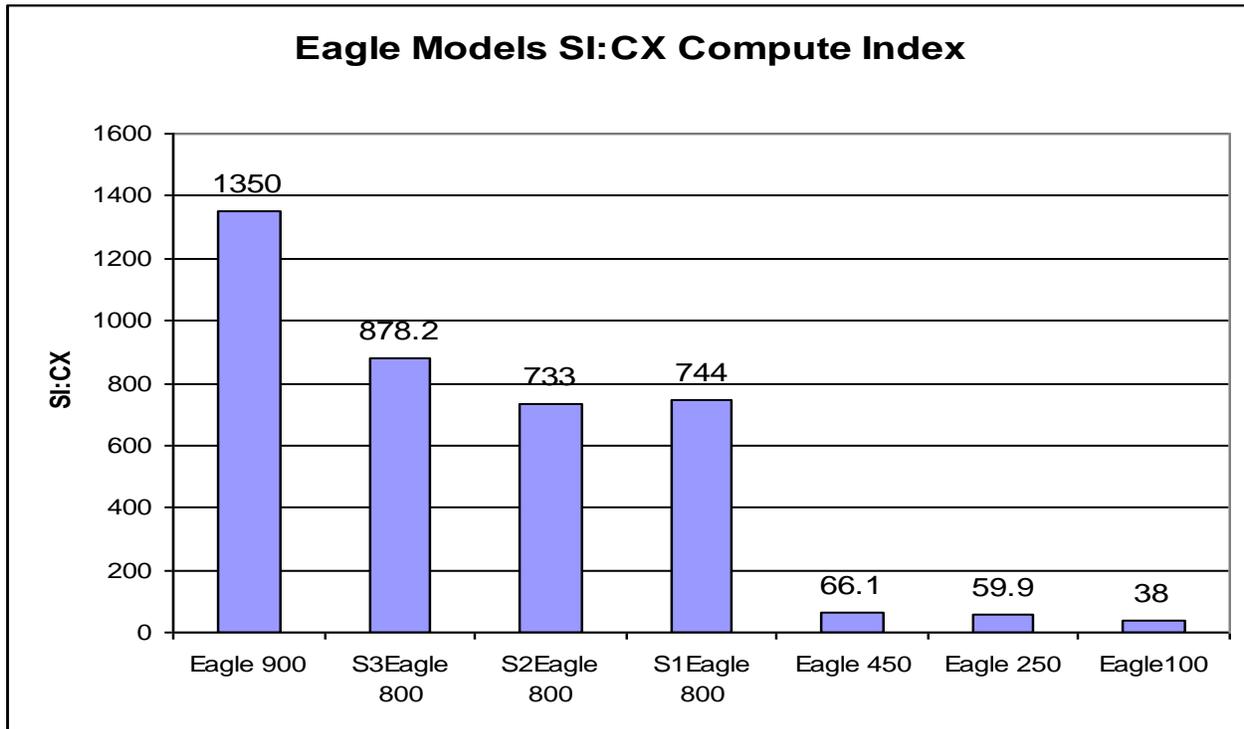


The sophisticated programmability of the new I/O controller chip on the AM-113-24 eliminates the need for the card to run E-AMOS™ to manage its serial ports, eliminating two sources of overhead.

Two forms of PCI slots have evolved: a 5-volt and a 3.3-volt variant. Motherboard manufacturers don't always tell you which version they use. Unlike the Eagle 800's AM-113-45

5-volt card, the Eagle 900's AM-113-24 will work in either type of PCI slot, providing more flexibility as motherboards debut and are discontinued.

To get an idea of the accumulated AMOS processing power improvement that the new CPU, RAM, and AM-113-24 board bring to the table, take a look at how the Eagle 900's SI Compute Index compares to previous Alpha Micro servers.



Microsoft Windows Embedded Standard 7[®]

In keeping with Alpha Micro's tradition of providing virus and malware-resistant server computers, Alpha Micro is building the Eagle 900 on top of the latest version of Microsoft's Embedded Operating System: Windows Embedded Standard 7[®]. For convenience, we will abbreviate this product's name to WES7. Like XP Embedded before it, WES7 allows Alpha Micro to build a base OS with just enough functionality to meet the needs of AMOS, but not enough to invite corruption from external sources.

Improved Cohabitation in Windows Environments

Alpha Micro's build of Windows Embedded Standard 7 provides some improvements that have been requested over the years:

- A) Ability to join a Domain: Now it will be easier to share files and printers on a Windows network. This will also permit you to access files on network drives directly from your AMOS programs.
- B) Improved Windows multi-tasking: The combination of the Athlon II CPU's three cores and Windows 7's improved scheduler means that your Eagle 900 can host specialized

applications in addition to AMOS, without fear that those apps will slow down AMOS. Example: The Delegate TCP/IP proxy software is gaining popularity among AMOS users, but it has until now been a resource hog. Now it will be feasible to host Delegate on an Eagle 900.

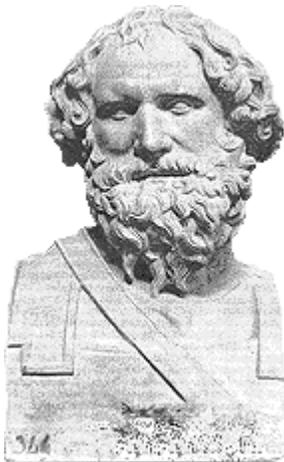
- C) Anti-Virus / Anti-Spyware software included: While AMOS itself remains immune to viruses and worms, ever more clever ways of bringing down systems are making their way onto networks. Microsoft Security Essentials[®] is included in our WES7 builds as a security precaution. The extra cores on the Athlon II CPU provide the horsepower to drive this software without affecting AMOS performance.

An Entirely New Disk Caching Approach: The Archimedes Cache

And now something really exciting: By now you've surely noted that many of the above enhancements relate to improving disk performance. Faster hardware and the improved Embedded OS can only take you so far, however.

When the AM-8000 and Eagle 800 were introduced in 2003, one of their most noteworthy features was dramatically faster disk throughput. The Windows disk cache was a large part of the reason for this jump in performance. Running in native x86 code on a fast CPU with ample memory, the Windows disk cache provides read-ahead and write-behind improvements well beyond what was and is possible with AMOS' 68000-side DCACHE disk cache.

Over the past three years, Alpha Micro has been investigating new ways to improve system performance. Assuming nothing, our engineers analyzed numerous aspects of system throughput. When it came time to look at the disk cache, we discovered that despite our initially favorable perceptions, Microsoft's cache was far from perfect. Scholarly research has been done on disk caching techniques; our staff located and poured over some of the third-party and university-level studies that have been conducted.



After extensive development and testing, we have been able to create a brand-new approach to disk read caching. Deficiencies in the Windows disk cache were identified, and the missing functions were created on the x86 side of AMOS for maximal efficiency. Reflecting its extensive use of mathematical logic, we have named our new system the **Archimedes Cache**. Archimedes was arguably the most accomplished mathematician in history, known among other things for approximating the value of pi, devising formulae that explained volume, describing the mechanics of a lever, and inventing a form of water pump. It also doesn't hurt that he has an "A" and an "M" in his name.

No matter whether your environment is sequential or random file-intensive, we are confident that the Archimedes Cache will significantly improve your throughput. You can enable and disable the Archimedes Cache on the AM9000 Configuration Window, select one of three modes to optimize its performance in your environment, and allocate varying amounts of RAM to it, to determine where it will provide the maximal benefit to your application.

The Archimedes Cache works with both Solid State Disks and conventional hard drives. Of course, the significantly faster underlying performance of Solid State Disks complement Archimedes technology, which is why Alpha Micro recommends that you use them.

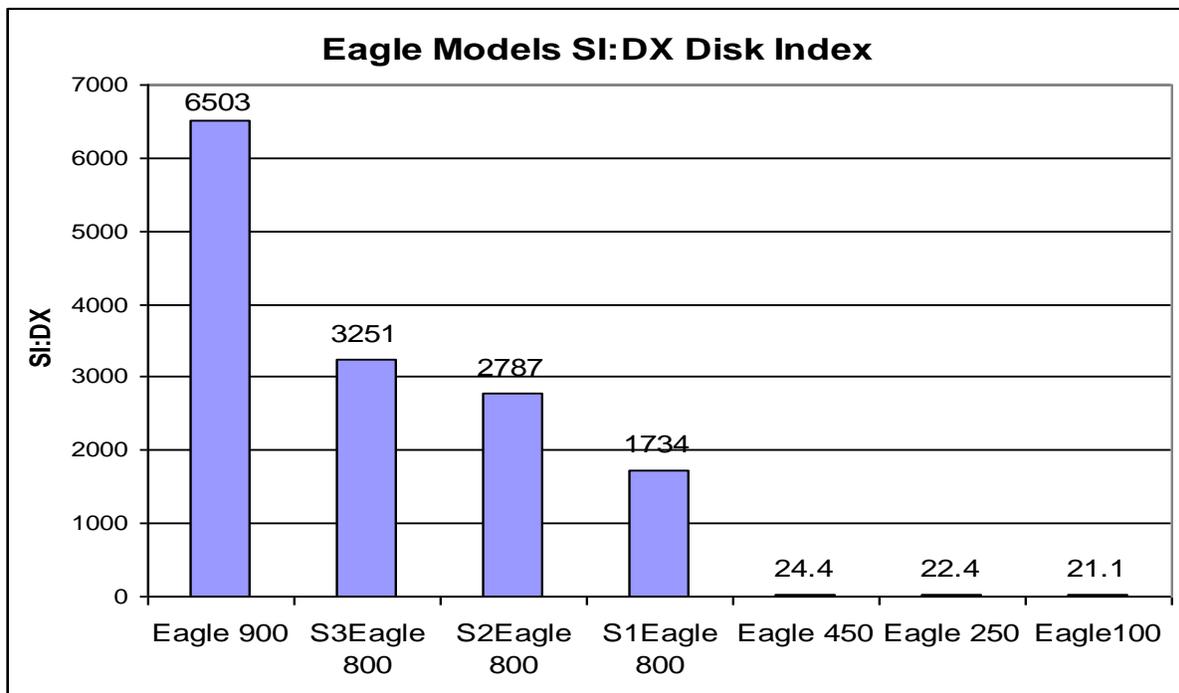
The Numbers Tell the Story

The Eagle 900 trounces its predecessors in CPU Speed, Floating Point, and especially in cached Disk I/O. And take a look at this: The Disk SI test yields 24 on an Eagle 450, 1734 on the Eagle 800 Series I, 2787 on the Series II, and 3251 on the Series III. **On the Eagle 900, the Disk SI is 6503. That's 3.75 times the Disk SI of the Eagle 800 Series I!**

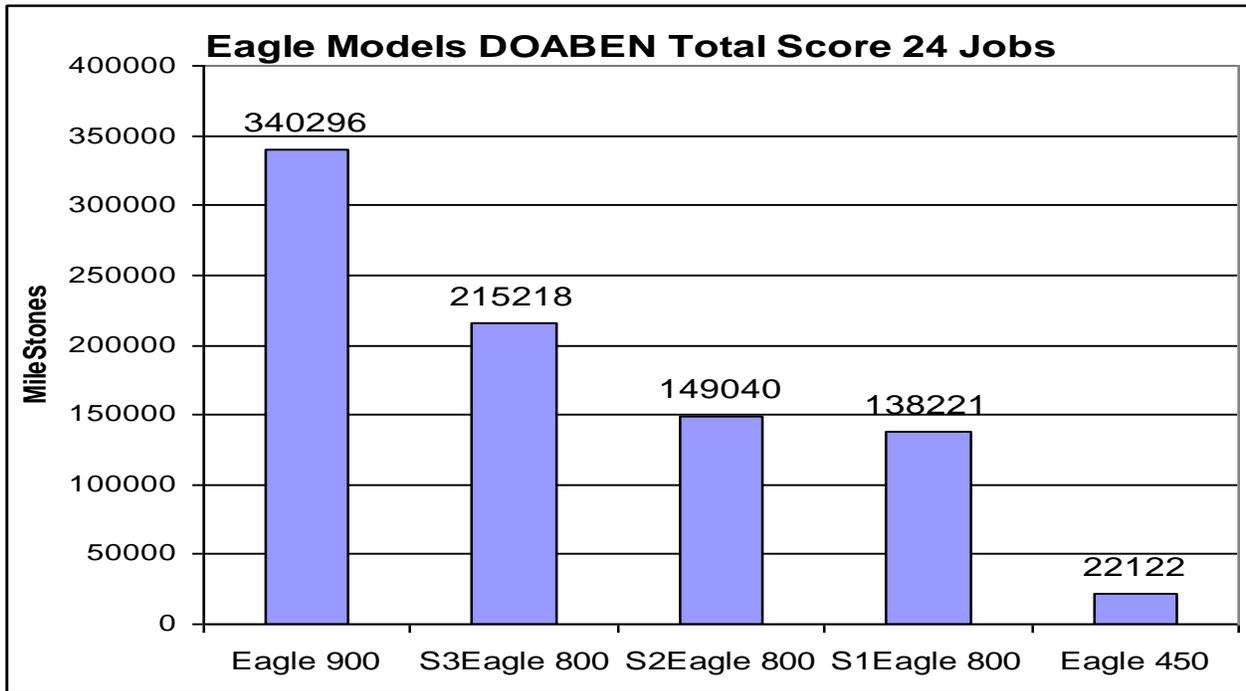
The familiar System Information benchmarking program, SILIT, provides a first glimpse into the performance of the Eagle 900. The tests conducted by SI display raw compute power and raw disk throughput. All numbers have been updated using the latest Version 1.1(949) of AM8000.EXE.

System	CPU SI:Cx	Floating Point Si4x	Dhrystones	Si:Dx Disk index
Eagle100	38.0	16.8	5627	21.1
Eagle 250	61.1	58	10366	22.1
Eagle 450	68.5	64	11293	24.4
Eagle 800 Series I	712	1170	85123	1734
Eagle 800 Series II	733.2	1210	89300	2787
Eagle 800 Series III	878.2	1430	107043	3251
Eagle 900	1350	2277	149220	6503

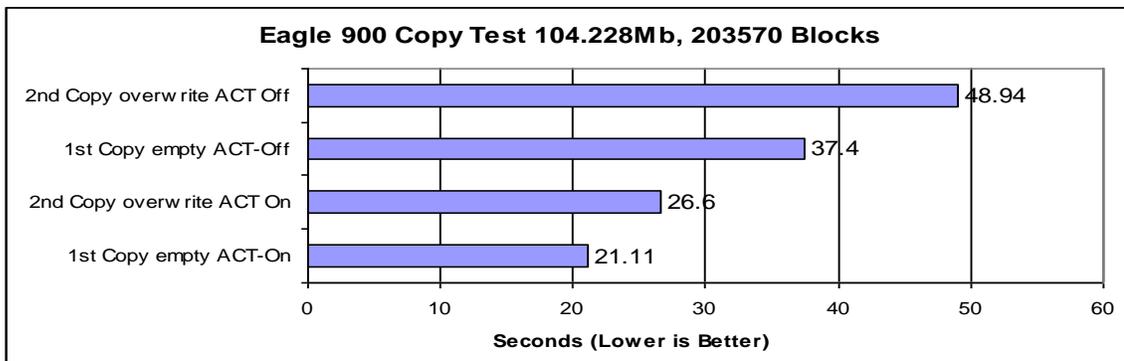
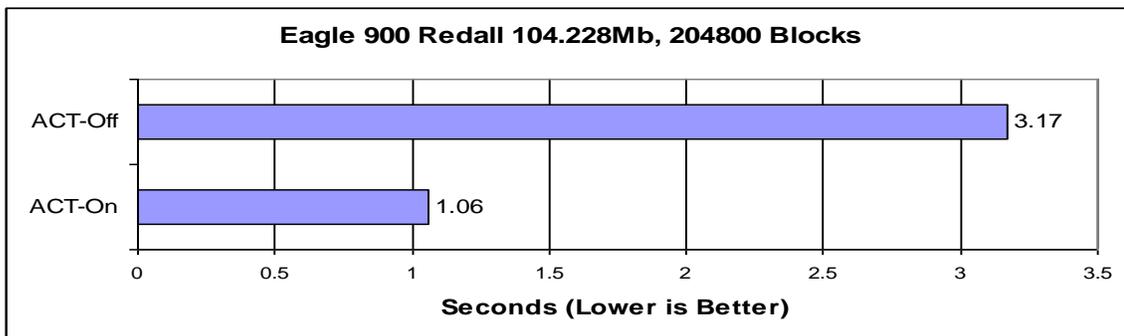
Here you can see the affect that Archimedes Cache Technology has on disk throughput:



The DOABEN Benchmark is a multi-job benchmark that performs compute tasks, disk I/O tasks and serial I/O on 24 Jobs.



REDALL and logical-to-logical COPY Benchmarks are easy-to-understand disk throughput tests. Note that COPY yields different results when writing to a blank logical versus overwriting existing files. Results are shown with Archimedes Cache Technology (“ACT”) on and off.

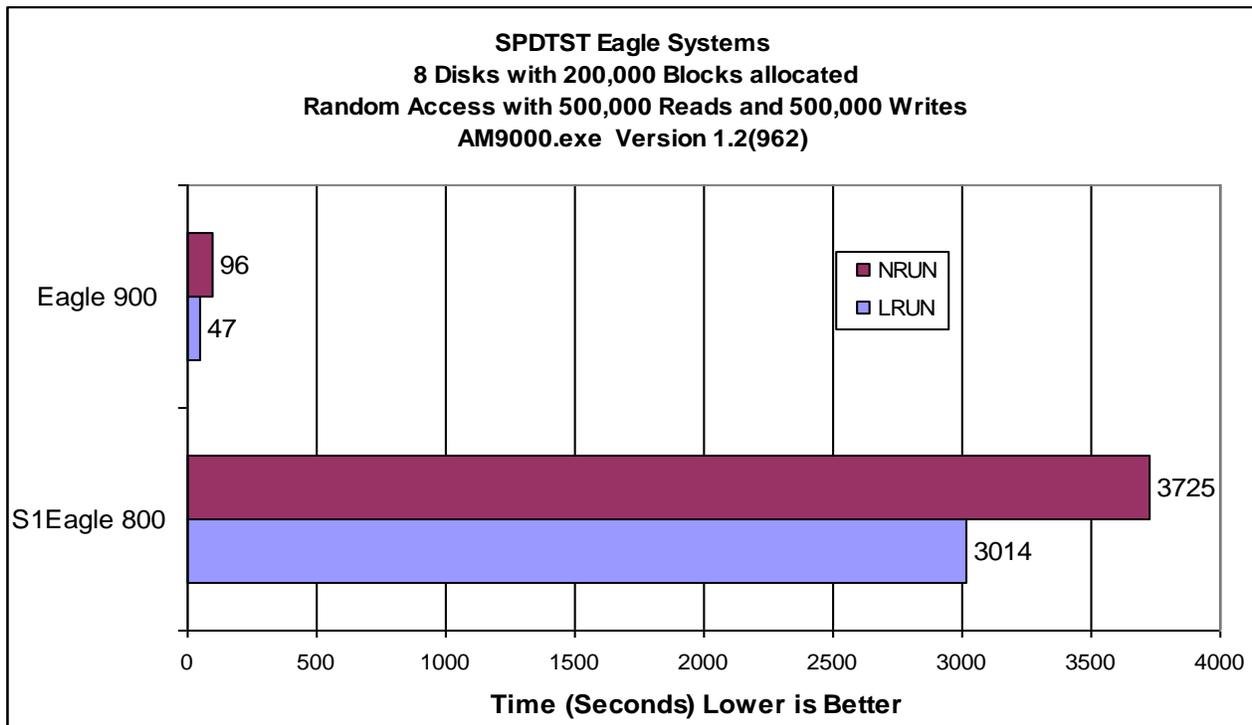


The popular Hoffmeister Benchmark, which consists of a payroll processing application representative of the typical use of an AMOS server, is no longer a useful test. It runs so quickly now that it has become statistically meaningless. To supersede the venerable Hoffmeister test, we have created:

The SPDTST Benchmark: SPDTST is an AlphaBASIC program (source code is available on the Alpha Micro FTP site) which creates PPNs and allocates random files on every logical disk on which there is sufficient room. It then randomly chooses a logical, randomly chooses a record within the random file on that logical, randomly chooses read or write mode, and then reads or writes a 512 byte record. It does this for a specified number of iterations, then deletes all of the random files and PPNs it created. It is a pure test of random AlphaBASIC™ I/O, exercising all of the underlying advancements in hardware and software.

And what a test it is: As the next chart shows, the Eagle 900 is **38 times faster than the Eagle 800 Series I** when both execute SPDTST using NRUN.

*Even better...*The Eagle 900 is **64 times faster** than the Eagle 800 Series I if LRUN (LightningRUN) is used on the Eagle 900 instead of NRUN. That's a greater performance improvement than the Eagle 800 Series I offered over the Eagle 450, and we all remember how impressive that was. It's so much faster that were we to include an Eagle 450 on this chart, the 900's performance bars would be so short, they would be invisible!





SATA RAID Available

The AM-452S internal SATA RAID is the unit of choice for environments requiring failsafe disk drive functionality. This RAID unit mounts inside the Eagle 900 and has been updated to incorporate the new SATA 3.0 hard drives. Updated pricing on the AM-452S RAID is included in the Reseller Supplement.

Failsafe Redundant Power Supply Available

An optional Redundant Power Supply provides continuous uptime in the event of a failure of one of the two power supply modules. This unit is an ideal complement to the above RAID to ensure maximum system uptime. This option requires the Eagle 900 large chassis option so the power supply can be mounted. And of course Alpha Micro's Automatic Reboot Box will work fine with the Eagle 900.

Multiple Backup Alternatives and Improved Windows Backup Software

The Eagle 900 supports several backup alternatives: Blu-ray and removable hard drive. Both of these technologies are accessible through AMOS commands and are detailed below. We continue to offer 1/4" Streaming Tape Drives as an alternative and familiar form of backup. Please note that tape cartridge pricing has been on the rise, to the point where a tape costs approximately the same as a SATA hard drive/tray combination.

Acronis® True Image™ Backup is included standard with each Eagle 900, replacing the venerable Norton Ghost® used in earlier systems. Like Ghost, Acronis provides drive imaging and bootable backups for disaster recovery. In addition, Acronis offers a variety of options for native Windows backups. You can have your AMD files or even your entire Windows file system backed up onto the hard drive or Blu-ray, manually or on a scheduled basis.

Choice of 4.7 GB DVD-RAM or 50 GB Blu-ray Drives

Two base models of the Eagle 900 are offered, one with a DVD-RAM drive and one with a higher speed Blu-ray optical drive. A PIC for Alpha Micro's MAKBD backup software is also included, along with a PIC for the previous MAKDVD software for backwards compatibility and data restoral.

The new generation Blu-ray drive offered for the Eagle 900 sports faster performance with multiple kinds of optical media including DVD-RAM. Most significantly, it supports the new BD-RE DL double layer rewritable discs. These discs offer **50 GB of rewritable capacity**, twice what previous Blu-ray drives could support.

Optional Hot-Swappable, Removable SATA Disk Drive for Backup

With the descending cost of high-capacity hard disk drives, it has become possible to offer a high speed backup alternative in the form of removable trays holding SATA disk drives. Backup and restore operations run faster on SATA hard drives than on tape, optical disc, or USB drives. As a result, you may choose to include a SATA tray with a removable 640 GB backup disk drive.

Hot Swap software is included to permit you to install and remove drives safely while the system is up and running. A Hot Swap operation (drive installation or removal) may be invoked from the AMOS command prompt as well as from an icon on the Windows Embedded boot console screen.



Costs on streaming tape cartridges have increased substantially in recent years. A hard drive backup solution that costs roughly the same as a tape cartridge and offers comparable portability, yet provides much faster backup and random-access file restoration, is simply compelling.

Optional Parallel SCSI

Since 1982, Parallel SCSI has been a popular means of connecting peripherals in the AMOS world. Older RAID units, tape drives, and external hard drives from existing systems typically use some variant of Parallel SCSI. The Eagle 900 supports SCSI devices by means of an optional PCI add-in card.

New Chassis

The Eagle 900 is built in a sturdy new design black chassis, similar in characteristics to the previous Eagle 800 chassis. This chassis includes housing for up to nine peripherals, including four 5.25" and two 3.5" externally accessible peripherals, and five 3.5" internal peripherals.

Five Serial Ports Standard

There is one COM port on the Eagle 900, plus 4 "Alpha Micro style" serial ports on the AM-113-24 card, for a total of five serial ports. Up to 31 additional COM ports may be added via PCI and USB COM port adapters, allowing for a maximum of 36 serial ports on this model of server.

Gigabit Ethernet

The Eagle 900 supports Gigabit Ethernet, providing horsepower for Web server, E-mail server, and FTP applications.

PCI Expansion

Two PCI Express 2.0 x16 slots, three PCI Express 2.0 x1 slots, and one 32-bit PCI slot support the addition of SCSI and COM port expansion cards. One additional 32-bit PCI slot is occupied by the AM-113-24 card.

AMOS License Carryover

AMOS licenses from all AMPC 6.x (SuperFalcon™), AMPC 7.x (Cardinal™), Eagle 750™, and AMOS 8.x systems (Eagle 800, Eagle 800LC™, and AM-8000) may be carried over to the AM-9000 at no charge.

Up to 16 AMOS port licenses from 68000 series systems may be carried over to the Eagle 900 at no charge. Keep in mind that LPR printers, and serial printers defined on the Windows side and TRMDEF'd via PCLPT do not consume AMOS port licenses. Even if your present AMOS license exceeds 16 ports, you may not require quite as many AMOS port licenses on the Eagle 900.

If you have a large amount of licenses to carry over, consider the AM-9000 system instead, which offers an unlimited AMOS license carryover from 68000 systems.

LightningBASIC™ Standard

All Eagle 900 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 Eagle 900 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!

Upgrades From Existing Alpha Micro Systems

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

Eagle LC Systems Discontinued

Because of low demand for the Eagle 800LC, there will not be an Eagle 900LC. Our VARs evidently believe the Eagle 750 and the full Eagle 800 / 900 adequately fulfill customer requirements.

Four Week Test Drives Available

Alpha Micro believes that we are somewhat unique in the computer industry in offering to provide a *four week advance loan* of our systems to VARs on Net 30 terms whose accounts are current. There is nothing like showing your customer the actual performance of our new generation systems. Alpha Micro has had an exceptional track record with the Test Drive program, with no system ever having been returned for performance reasons.

The fine print: A limited number of Eagle 900s are available for the Test Drive program, thus Alpha Micro cannot guarantee availability when you want it. A Test Drive is only offered once per prospective end user and SSD number. For example, a particular user cannot test drive a system in August, return it, and ask for another test drive in January. Either payment or return of the system is required at the 30 day mark. Net 30 terms do not entitle you to an additional 30 days to pay after the date of acceptance, as the Test Drive program is not an extension of credit. Shipping and insurance from Alpha Micro is billable; in the case of a return, the return shipping and insurance are your responsibility. Systems not received back at Alpha Micro 45 days from the date of shipment from Alpha Micro are deemed sold and are not returnable.

Improved Technology – Same Price

Alpha Micro has priced the Eagle 900 at the same price as its predecessor Eagle 800 Series III system.

Availability

Eagle 900 systems are available for shipment now. All pending Eagle 800 Series III orders will be filled as Eagle 900 orders unless you tell Order Administration otherwise. Eagle 800 systems will be treated as custom builds for special requirements only.

Tremendously improved speed – better security and Windows cohabitation – more convenient and economical backup – Windows 7 framework - All reasons why the Eagle 900 is an exciting platform for new and existing AMOS sites.