# Amdahl 6680 EDAS

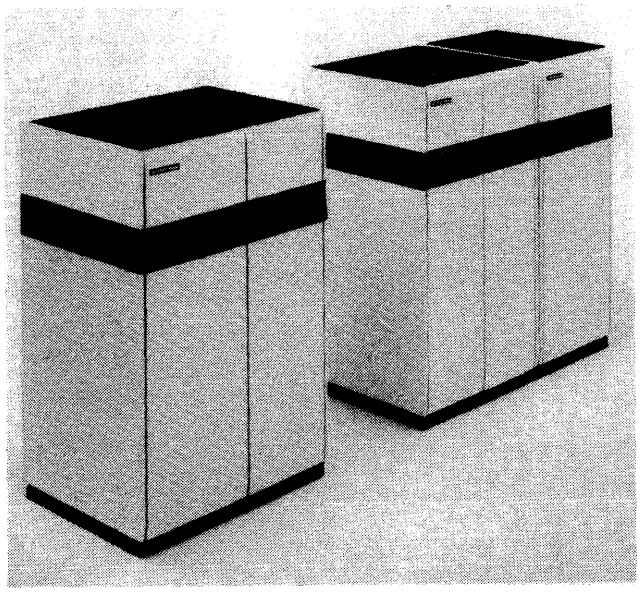
## MANAGEMENT SUMMARY

Last year, Amdahl expanded its 6000 Series storage product family with the introduction of the 6680 Electronic Direct Access Storage (EDAS) product. The 6680 EDAS, which incorporates 256-kilobit dynamic random access memory (DRAM) chips, uses semiconductor memory to provide improved response times, system throughput, and on-line productivity. With a 3-megabyte-per-second data transfer rate, EDAS offers performance without the mechanical delays associated with conventional, rotating, magnetic disks. When using the High-Speed Channel Feature (HSCF), EDAS breaks the 3.0-megabyte-per-second standard with a data transfer rate of 4.5 megabytes per second.

The 6680 EDAS is designed for installations with a critical applications or performance requirement, highly active system data sets, paging/swapping, or log data. EDAS emulates the IBM 3380 or Amdahl 6380 disks and is fully compatible with 3380-format devices without the need for special systems support software or modification of existing software.

### COMPETITIVE POSITION

The 6680 EDAS competes with the Intel Fast-3825 Semiconductor Disk, NAS 7900 Semiconductor Disk Subsystem (SCD), Storage Technology 4305 Solid-State Disk, and Memorex 6880 Solid-State Storage Subsystem. Like EDAS, all of these subsystems emulate the IBM 3380 ➢



*The Amdahl 6680 Electronic Direct Access Storage (EDAS) product features a maximum memory capacity of 512 megabytes and a maximum transfer rate of 4.5 megabytes per second.*

**The Amdahl 6680 Electronic Direct Access Storage (EDAS) product is a high-speed storage subsystem that is supported by all IBM and IBM-compatible computer systems. Standard features include dynamic extended pathing, dual power supplies, and integrated microdisk backup.**

**MODELS: 6880 Model S2 or S2E Storage Control Unit (SCU) and the 6680 Electronic Storage Unit (ESU).**
**CONFIGURATION: One or two 6880 Model S2 or S2E SCUs, one or two 6680 ESUs, and 32 to 256 megabytes of storage per ESU. The data transfer rate is 3 megabytes per second.**
**COMPETITION: Intel Fast-3825 Semiconductor Disk, NAS 7900 Semiconductor Disk Subsystem, Storage Technology 4305 Solid-State Disk, and Memorex 6880 Solid-State Storage Subsystem.**
**PRICE: Purchase prices range from $58,970 to $134,480 for the control units and from $81,030 to $431,030 for the storage units.**

## CHARACTERISTICS

**MANUFACTURER: Amdahl Corporation, 1250 East Arques Avenue, P.O. Box 3470, Sunnyvale, California 94088-3470. Telephone (408) 746-6000.**

**MODELS: 6680 Electronic Direct Access Storage (EDAS).**

**CONTROLLERS: Two controller models are available: the 6880 Model S2 and Model S2E Storage Control Unit (SCU). Each 6880-S2 has two storage directors and a two-channel switch. A four-channel switch configuration is also available. The 6880-S2E has two storage directors with 8 unique channels per storage director, which allows 16-channel access to the EDAS with one control unit.**

**Four or eight remote switches are also available, allowing the channel interface switches for the 6880-S2 or 6880-S2E to be located remotely on a control panel in the data center.**

**The Dynamic Extended Pathing (DXP) feature provides two independent, concurrent paths to the semiconductor memory. Quad Extended Pathing (QXP), which requires two 6880-S2 SCUs, provides four independent data paths to the EDAS subsystem.**

**The Multiple Access Facility (MAF), which is a standard feature on the 6680, allows two concurrent paths to a single logical volume of data. When used in conjunction with the optional QXP feature, MAF provides four concurrent accesses. In either case, this feature can reduce device contention in shared DASD environments.**

**COMPUTERS INTERFACED: EDAS is supported by Amdahl's UTS/580 operating system and the vector pro-** ➢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Direct Access Storage Device and are compatible with the 4300, 303X, 308X, and 309X computer systems. Vendors have concentrated on developing facilities for these computer systems because IBM no longer offers a semiconductor storage system but offers the Expanded Storage Option—an internal solidstate device that manages paging and swapping operations—for the 3090 Series.

To date, Amdahl and NAS are the only vendors to break the 3-megabyte-per-second industry standard. With its 7990-2X on its XL Series computers, NAS surpasses all competition with a 6-megabyte-per-second data transfer rate. The EDAS semiconductor subsystem offers a 4.5-megabyte data transfer rate as an optional feature on all 580 Series processors and 6680 EDAS subsystems. The HSCF does not require applications or systems software modifications when used with Amdahl's UTS/580 or with IBM's MVS/370, MVS/XA, and VM/SP HPO operating systems. This feature is priced at $20,000 per 6880 EDAS storage control unit.

Both Amdahl and Memorex offer subsystems with storage sizes that range from 32 to 512 megabytes. During the past year, StorageTek increased the maximum memory capacity of the 4305 Model 6 from 192 to 768 megabytes. NAS has increased the maximum memory capacity of its 7900 SCD from 512 megabytes to 2 gigabytes, making it the largest storage capacity available in the industry.

## ADVANTAGES AND RESTRICTIONS

The 6680 EDAS offers 1.5-, 2.0-, 3.0-, and, with the HSCF, 4.5-megabyte-per-second data channel transfer rates. For flexibility in multiple CPU environments, users can intermix channel speeds on a single EDAS subsystem. In addition, the HSCF can run concurrently with lower speed channels.

Since semiconductor memory is highly volatile, users should consider backup systems to protect data in the event of a power failure. While all vendors offer optional battery units, only Amdahl, Memorex, and NAS offer internal backup disks.

The 6680 EDAS offers a variety of fail-safe capabilities. Each electronic storage unit (ESU) features dual power supplies and integrated 5¼-inch backup microdisks. In addition, the 6680 ESU patrol function continuously monitors memory and microdisks to improve subsystem availability and reliability. The EDASDRF software utility provides off-line dump/restore operations between logical volume storage and microdisks while the 6680 EDAS is disconnected from the host processor. The optional 6681 Battery Unit provides additional data protection by enabling the 6680 ESU to copy the data automatically onto the microdisks whenever external power is interrupted. Once power has been restored, the data is read back from the disks to the semiconductor memory. □

**cessor operating systems. The 6680 is also supported by all IBM and IBM-compatible operating systems that support the 3380D- or 3380E-format devices.**

**CONFIGURATION: The basic 6680 system configuration consists of a 6880 Model S2 or S2E SCU and one 6680 Electronic Storage Unit (ESU). Storage sizes range from 32 to 256 megabytes, in 32-megabyte increments. The maximum system configuration consists of two 6880 SCUs; two 6680 ESUs, each with 256 megabytes of storage; and one or two optional 6681 Battery Units (BUs).**

**PHYSICAL CHARACTERISTICS: The weight and dimensions of the Amdahl storage units are listed in the following table.**

| 6880 SCU | Width (in.) | Ht. (in.) | Depth (in.) | Wt. (lb.) |
|---|---|---|---|---|
| S2 | 44.3 | 66.5 | 32.5 | 960 |
| S2E | 60.0 | 66.5 | 32.5 | 1,230 |
| 6680 ESU *(1)* | 37.0 | 66.5 | 32.5 | 1,075 |
| 6681 BU *(2)* | 27.2 | 66.5 | 32.5 | 1,100 |

*(1) 256MB 6680 ESU with QXP.*
*(2) Maximum capacity 6681 BU.*

**Power consumption ranges from 1.1 kVA for the 6880-S2 control unit to 2.2 kVA for the 256-megabyte storage unit with QXP. The BU consumes 0.3 kVA in standby mode and 1.6 kVA when charging. Power requirements range from 1,050 W for the 6880-S2 and 1,450 W for the 6880-S2E control unit to 2,000 W for the storage unit. For the battery unit, power dissipation requirements range from 280 W in standby mode to 1,500 W when charging. Air flow requirements for EDAS is 6 $m^3$/min. for the control units, 9 $m^3$/min. for the storage unit, and 4 $m^3$/min. for the BU. A maximum configuration EDAS subsystem with 512 megabytes of semiconductor memory occupies 49.6 square feet of floor space, not including service clearance.**

**PERFORMANCE: EDAS operates at 3.0 megabytes per second on datastreaming channels or 1.5 to 2.0 megabytes per second on nondatastreaming channels. When attached to an Amdahl 580 Series processor, EDAS offers a High-Speed Channel Feature that increases the data transfer rate to 4.5 megabytes per second. The basic EDAS subsystem is available in storage sizes ranging from 32 to 256 megabytes. A second 6680 storage unit with 256 megabytes can be attached to the 6880 control unit, yielding a total semiconductor memory configuration of 512 megabytes.**

**The 6680 EDAS is 3380-format compatible and can be configured as 1 to 16 logical volumes. Storage sizes for each of these logical volumes can range from 1 to 128 megabytes. The MAF, which is a standard feature on the 6680, allows two concurrent accesses to a single logical volume of data. When used in conjunction with the optional QXP feature, MAF provides up to four concurrent accesses to each logical volume. With QXP, the aggregate data transfer rate is 12 megabytes per second. The aggregate data transfer rate increases to 18 megabytes per second when using the High-Speed Channel Feature.**

**SYSTEM FEATURES: The 6680 EDAS uses semiconductor memory for fast data access and integrated 5¼-inch microdisks for backup memory. The EDAS off-line/dump restore facility allows backup, verify, and restore operations between logical volume storage and the microdisk**

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units while the 6680 ESU is disconnected from the host processor. Duplexed power supplies in each storage unit provide continuous subsystem operation and data availability in the event that a power supply fails. The 6680 patrol function continuously monitors memory and microdisks to improve subsystem availability and reliability.

The optional 6681 BU provides DC power to maintain chip function and data availability in the event of a power loss or fluctuation. If, after 60 seconds, AC power is not restored, the EDAS system uses battery power to back up the data automatically onto 5¼-inch microdisks. Once AC power is restored, the data is read back from the microdisks to the semiconductor memory.

PRICING AND SUPPORT: Purchase prices for 6680 EDAS components are shown in the price list following this report. Contact Amdahl directly for more detailed information.

## EQUIPMENT PRICES

| | | Purchase Price ($) | Monthly Maint.* ($) | 2-Year Lease ($) |
|---|---|---|---|---|
| 6880-S2 | Storage Control Unit | 58,970 | 210 | 2,724 |
| 6880-S2E | Storage Control Unit | 134,480 | 426 | 6,220 |
| 6680 | Electronic Storage Unit, 32 megabytes of storage | 81,030 | ** | ** |
| 6680 | Electronic Storage Unit, 64 megabytes of storage | 131,030 | ** | ** |
| 6680 | Electronic Storage Unit, 128 megabytes of storage | 231,030 | ** | ** |
| 6680 | Electronic Storage Unit, 256 megabytes of storage | 431,030 | ** | ** |
| 6681 | Battery Unit | ** | — | — |
| — | High-Speed Channel Facility | 20,000 | — | — |
| — | Four-Channel Remote Switch | 800 | — | — |

*Maintenance service for 7 days/week, 24 hours/day.*
***Contact vendor for pricing.* ■


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