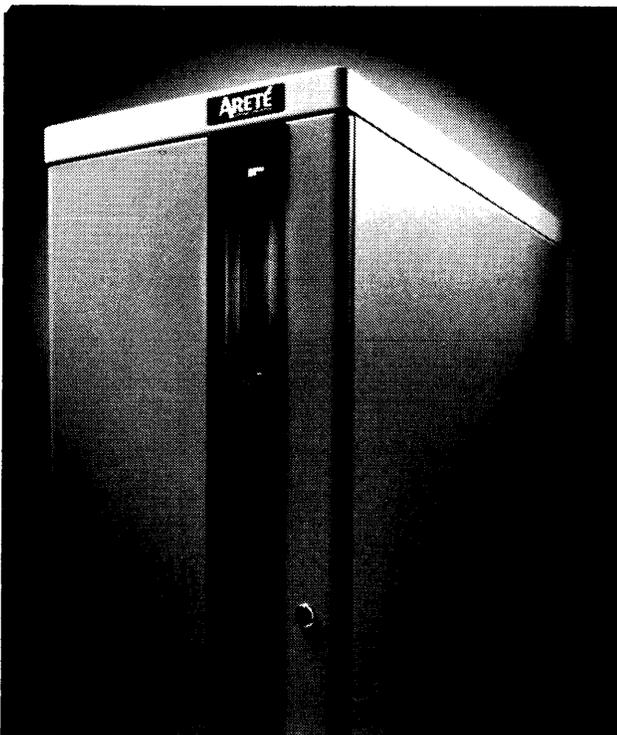# Areté Series 1000

MANAGEMENT SUMMARY

Areté Systems Corporation is named after the Greek word for excellence. To the Greeks, excellence incorporated the concepts of balance and harmony. The choice of the name reflects Areté's belief that it has achieved increased power in computing through a new balance in computer architecture. Whether that's true or not, balance is a term that Areté officials should be familiar with, because the San Jose, California-based vendor is going through a balancing routine in an effort to redistribute the selling of its supermicrocomputer product line, the Series 1000.

Originally, when Areté was starting up in 1982, the majority of its customers were Value-Added Resellers (VARs), selling 90 percent through a mix of resellers and 10 percent to large-scale end users. Currently, though, Areté is reshaping its philosophy and attempting to increase its sales to end users. This isn't to say that Areté has abandoned VARs—however, the company has realized that to keep afloat in the highly competitive supermicrocomputer market, it can remain profitable only if it pushes its computers down both sales avenues.

Another reason that Areté is stepping up its sales to end users has to do with the history of the company. Back in 1984, Areté landed a large contract to OEM the Series 1000 ▷

The Areté Series 1000 comprises three models which support from 2MB to 16MB of main memory and from 168MB to 8GB of disk storage. Up to 256 users are supported on the Unix-based supermicro system.

The computers in the Areté Series 1000 are designed to serve as commercial computing machines in office automation, departmental processing, and banking and insurance environments. The Series 1000 runs a version of AT&T's Unix System V called Arix Version 4.0.

MODELS: 1100, 1200, and 1600.
MEMORY: 2MB to 16MB.
DISK CAPACITY: 168MB to 8GB.
WORKSTATIONS: Up to 256.
PRICE: Purchase prices range from $49,000 to $67,000 for basic systems.

CHARACTERISTICS

VENDOR: Areté Systems Corporation, 821 Fox Lane, San Jose, California 95131. Telephone (408) 432-1200.

DATA FORMAT

BASIC UNIT: 32-bit word.

INTERNAL CODE: ASCII.

MAIN STORAGE

Memory boards provide the Series 1000 with its dynamic RAM. Each memory board provides the system with 2, 4, or 8 megabytes of main memory accessible by the Application Processors (APs) and by I/O Processors (IOPs) through the Bus Memory Controller (BMC).

All three Series 1000 models support from 2MB to 16MB of main memory.

PROCESSING COMPONENTS

The Series 1000 supports Application Processors (APs) and a Memory Management Unit (MMU). Model 1100 supports one or two APs; Models 1200 and 1600 support one to four APs.

The Application Processor is designed around a 12.5MHz Motorola MC68020 microprocessor. The 68020 is a fully integrated microprocessor with a full 32-bit architecture. The processor supports an unsegmented address space, 17 general-purpose registers, and a high-level language-oriented instruction set. The MC68020 supports an 8KB high-speed cache memory. The 80-nanosecond cache memory is arranged as a write-through cache, which allows the MC68020 to run at 12.5MHz without wait states.

Cache hit rates of 93 percent to 98 percent (with typical instruction mix) reduce bus traffic, thereby improving system throughput. All reads from memory (whether instruction or data) are cached; and all writes to cache are written through to maintain system cache concurrency throughout the system. The two-set cache is direct mapped, so each memory location corresponds to only one cache location. Redundant tag bits are provided to allow monitoring of the Processor/Memory Bus for updates without wait states. ▶

Areté Series 1000

CHART A. SYSTEM COMPARISON

MODEL	1100	1200	1600
SYSTEM CHARACTERISTICS			
Date of introduction	1983	1984	1984
Date of first delivery	1983	1984	1984
Microprocessor type	MC68020	MC68020	MC68020
Microprocessor cycle time	12.5MHz	12.5MHz	12.5MHz
Operating system	Arix Version 4.0	Arix Version 4.0	Arix Version 4.0
Upgradable from	Not applicable	Not applicable	Not applicable
Upgradable to	Not applicable	Not applicable	Not applicable
Number of serial/parallel I/O ports	6	12	12
Number of expansion slots	10	19	19
MEMORY			
Minimum capacity (bytes)	2M	2M	2M
Maximum capacity (bytes)	16M	16M	16M
DISK STORAGE			
Minimum capacity (bytes)	168M	168M	168M
Maximum capacity (bytes)	8G	8G	8G
NUMBER OF WORKSTATIONS	40	256	256
COMMUNICATIONS PROTOCOLS	BSC/3270, 2780/3780, RJE, HASP, SNA, SNA/3270, SNA/3770, Ethernet TCP/IP, X.25, NFS	BSC/3270, 2780/3780, RJE, HASP, SNA, SNA/3270, SNA/3770, Ethernet TCP/IP, X.25, NFS	BSC/3270, 2780/3780, RJE, HASP, SNA, SNA/3270, SNA/3770, Ethernet TCP/IP, X.25, NFS

▷ to the Sperry Corporation (now part of the Unisys Corporation). Obviously, this $100 million contract was a boon to Areté, a company now valued at $30 million, establishing the vendor as a leading source of Unix-based supermicrocomputer systems; Sperry remarkets the Series 1000 as the Sperry Series 5000. However, when Sperry was taken over by the Burroughs Corporation in 1986, Areté realized that the future of its largest account hung in the balance. The fate of the Series 5000 is uncertain because Unisys is deciding what to do with its Unix-based supermicros, the Series 5000 and the XE500. And, Unisys is looking at other supermicro manufacturing sources, such as the NCR Corporation.

Since the Unisys merger, Areté has been urging potential Series 1000 customers to buy the system directly from Areté rather than from Unisys. Areté tells customers that the Series 5000 line may be dropped by Unisys and that Unisys will not upgrade a system—rather it will sell the customer a new model. On the other hand, Areté stresses to customers that it sells field-installable upgrade boards, resulting in cost savings for its customers.

Why would Areté jeopardize its relationship with Unisys? Obviously, Areté believes it has taken an aggressive enough sales stance in inking marketing agreements with distributors, in particular in foreign markets, in order to increase its customer base. For example, Areté recently signed a distribution agreement with Marubeni International Electronics Corporation to market and distribute Areté's product line in Japan. The vendor has signed similar agreements with companies in Singapore, France, Spain, Australia, and New Zealand.

COMPETITIVE POSITION

The Series 1000 is a Unix-based multiuser system designed for intensive departmental I/O operations in the depart- ▷

▶ A clock/calendar circuit provides both realtime clock and calendar functions. The programmable RS-232-C serial communications channels on the AP are used as a remote diagnostics port and system console. EPROM is also provided on the board. Firmware on the board includes a power-on self-test, monitor system diagnostics, and the initial program load sequence.

The Memory Management Unit (MMU) employs a two-level address translation technique which allows the AP to map all processes at logical address zero and scatter load processes into any set of 4KB physical pages. It provides multiple protection modes to protect any physical page from an illegal access. To allow the implementation of efficient, demand-paged Virtual Memory algorithms, the MMU hardware also keeps access statistics on each physical page.

INPUT/OUTPUT CONTROL

The Communications and Control Bus (CCB) synchronizes and coordinates component system parts. The CCB provides a means for the master AP to acquire status from, and send commands to, all of the other processors in the system. A register, accessible through the CCB, allows the master AP to determine the type of board in each slot of the backplane, allowing automatic system configuration during power-up.

The CCB is a single master, multiple slave bus. The master AP is responsible for the timing of all transfers across the CCB. Each slave responds to an address derived from the slot location of that slave. Slaves may request the attention of the bus master by several prioritized interrupt request lines. Polling is used to determine which of several slaves requires service if more than one slave is assigned to the same interrupt request level.

The CCB is capable of addressing up to 16MB of memory. Each board in the system is allocated a total of 64KB of unique memory space out of the total 16MB address space of the CCB. A few locations at the top of each 64KB range are defined as control and status registers. These registers are present on all boards attached to the CCB and, additionally, have certain information fields (such as board type) in prescribed locations. The address space below the required registers is used for application-specific registers or memory. ▶

· mental environment. The Series 1000 is suited for a variety of commercial application areas, including office automation, ordering, inventory accounting, finance, transaction processing, budgeting, scheduling, and data base management.

Competition for the Series 1000 includes systems from a variety of vendors, including IBM's System/38, Digital Equipment Corporation's VAX 8200, Hewlett-Packard's HP 9000, and Data General's MV/7800 and MV/7800 DC. In many respects, though, the Unisys Series 5000, which as noted earlier is bought from Areté, has to be considered the primary competitor of the Series 1000.

In a comparison of the Unisys Series 5000 and the Areté Series 1000, a number of differences between the two systems surface. Although the processors and the operating system are the same, Unisys offers much more software for the Series 5000, and many more peripherals than the Series 1000. Since Areté is pushing the Series 1000 in an office automation situation, office automation software is a necessity. However, Areté offers very little office automation software in its catalog. Conversely, Unisys is also concentrating on office automation markets for the Series 5000 and offers quite a few packages for its own system. Unisys customers can take advantage of the Sperrylink office automation package and Unisys communication packages, such as IS 5000, which connects Series 5000 terminals together in a departmental local area network.

Also, an entire Series 5000 can be purchased from Unisys, including peripherals. This differs from the Areté system, whose customers must buy peripherals from another source. Another consideration when choosing between the two systems is sales support and maintenance. Since Unisys has a direct sales force, and Areté has just recently begun pushing direct sales to end users, it must be noted that Unisys has a decided advantage over Areté in this category; Areté has only nine sales offices established in the U.S., versus Unisys' sales offices in almost every city in the country. In terms of product support, Unisys has a large entrenched maintenance department, whereas Areté's product support department consists of 14 support analysts.

Price is a minor consideration when comparing the two systems. In comparing both top-of-the-line systems from the two vendors—the Model 1600 from Areté and the Model 90 from Unisys—the difference in price of the similarly configured models is a little over $1,000, with the Series 5000 being more costly. That $1,000 price difference should not be much of an influence when making a decision. What is important is the aftersales support that Areté or Unisys can offer.

However, where Areté may be lacking in direct sales support to end users, the vendor is pushing its Areté Accord program, a program designed to offer VARs sales and support capabilities. A key component of Areté Accord is a three-year warranty on the entire system, compared with system warranties from other vendors that average 90 days. ▷

▶ The Processor Memory Bus (PMB) is the centerpiece of the tightly coupled computational subsystem. All data passing to and from the main memory is transmitted on the PMB. The PMB accommodates a 26-bit address field and a 32-bit data field. A logic board which desires communication with the main system memory asserts its own request line and awaits a grant response from the PMB bus arbiter located on the Bus Memory Controller.

The Mass Storage Bus (MSB) services the I/O subsystem. The MSB is used to move data blocks between the memory and the Input/Output Processors (IOPs). The MSB provides a parallel data pipe for the system. The data path of the MSB is 32 bits wide and has a bandwidth of 25MB per second.

The Utility Transfer Bus (UTB) is used to transmit general system status information. The UTB monitors system parameters, such as temperature conditions and the external battery backup system. In addition to its monitor function, the UTB allows the master Application Processor to control the output of the 5-volt system power supply between preset limits and to reset all other logic in the system.

The Data Base Processor (DP) allows the Series 1000 system to interface with Winchester disk drives, streaming cartridge drives, and half-inch, 9-track tape drives. The DP consists of a single board with an MC68000 microprocessor (8MHz, no wait states) and 256KB of on-board static RAM (64KB are dual ported into main memory). All commands are sent to the processor in the form of command "blocks" and specify only logical address or devices. The on-board microprocessor off-loads the effort of logical-to-physical address translation from the AP, freeing this resource for other tasks. The DP supports any combination of SMD, HSMD, or ESMD drives, with an average access time of 20 microseconds or less.

The DP communicates with its interface board through the Interface Bus (IB). This bus is used only by the DP. All of the integrated circuits which drive and receive signals from the disk and tape drives are mounted on the interface board.

The backplane is a printed circuit board that provides a physical environment for the four buses. The backplane is physically connected to the other boards in through DIN connectors in each slot position.

The function of the Bus Memory Controller is to control the memory subsystem. This includes the refresh of dynamic RAMs, error detection, error correction, and limited error logging. The memory subsystem comprises the BMC and one or more memory boards. Only one BMC is used in each Series 1000.

CONFIGURATION RULES

Models 1100, 1200, and 1600 are the three members of the Areté Series 1000. The difference between the 1100 and the 1200 is the number of bus slots supported—10 and 19, respectively. The Model 1600 is identical to the Model 1200 in terms of number of card slots in the backplane, but offers a different complement of peripherals. All models can be configured and balanced to support a number of applications through combinations of different optional printed circuit boards.

Models 1100 and 1200 are packaged with a 45MB cartridge tape drive. The 1600 is packaged with a 9-track 1600/3200 bpi tape drive. All three models can support up to 12 disk drives, and all three models support from one to four external tape drives.

INPUT/OUTPUT UNITS

See Chart B for disk and diskette devices. ▶

Areté Series 1000

CHART B. DISK/DISKETTE DEVICES

MODEL	D168	D337	D474	D689
Type	Winchester	Winchester	Winchester	Winchester
Size (inches)	8	8	10.5	10.5
Number of surfaces	—	—	—	—
Formatted capacity per drive (bytes)	168M	337M	474M	689M
Interface/controller	—	—	—	—
Number of drives per interface/controller	1-16	1-16	1-16	1-16
Average access time	20 ms	20 ms	20 ms	20 ms
Data transfer rate	1.8MB/sec.	—	—	—
Sectors/tracks per surface	Varies	Varies	Varies	Varies
Bytes per sector/track	Varies	Varies	Varies	Varies

Note: A dash (—) in a column indicates that the information is unavailable from the vendor.

▷ In conclusion, Areté has obviously had success with OEMs, and is now offering an attractive package for VARs. However, direct sales and support to end users are shaky areas for the vendor, and prospective Areté buyers should take this into consideration when selecting a Series 1000.

ADVANTAGES AND RESTRICTIONS

The absence of large quantities of application software for the Series 1000 could be a disadvantage for some installations. However, since Areté is gearing the Series 1000 for VARs, the government, and large-scale end users, this lack of software may not affect those customers, because they are big enough to have an in-house staff developing their own software. Still, they must absorb the cost of software development and maintenance.

A decided advantage of the Series 1000 is the amount of communications software available for the system. Areté has compiled an abundance of data communications facilities, including X.25, Ethernet TCP/IP networking, and communication with IBM and IBM-compatible systems in cross-vendor computing applications. The Series 1000 also is compatible with the Network File System (NFS), allowing a network of numerous terminals in departmental processing situations.

USER REACTION

We recently visited an Areté site for an in-depth look at a Series 1000.

The site has had a Model 1600 installed since 1985. The system comprises four Motorola MC68020 Application Processors and twelve Motorola MC68000 processors. The system is configured with 4MB of main memory; disk storage consists of a 698MB Fujitsu disk drive and a nine-track, 6250 bpi tape drive. This east coast *Fortune* 500 publishing company is using the Model 1600 to handle up to 256 users in a distributed conferencing application. More specifically, the Series 1000 is accessed by the users' magazine subscribers via a data base which allows them to call up electronic information that has been published in the magazine. Therefore, subscribers are able to access this information exchange via a personal computer and a modem. Application software running on the system includes Unify Corporation's Unify data base management system. ▷

▶ Areté does not sell either workstations or printers. However, ASCII terminals and Centronics-compatible printers are supported on the Series 1000.

OTHER PERIPHERALS: The Series 1000 supports an Archive streaming cartridge tape drive (45MB) and from one to four 9-track, half-inch tape drives (92MB and 180MB capacity), with a recording density of 1600/3200/6250 bpi. Attachment is via the Pertec 9-track tape interface.

COMMUNICATIONS

The Data Communications Processor (DCP) supplies multifunction support to a mixture of synchronous and asynchronous lines. The DCP does this by off-loading character-oriented I/O and line control from the computer's main computational subsystem.

The DCP consists of a single board with an MC68000 microprocessor and up to one megabyte of on-board static RAM (64KB are dual ported into main memory).

Each DCP includes one parallel port and eight serial RS-232 ports, each with baud rates software selectable from 110 to 38,400. All serial ports are terminated at the rear of the main cabinet with standard 25-pin "D" connectors.

Serial ports may be selected for modem (DCE) or terminal (DTE) control. Two of the serial ports can be configured for synchronous operation. The parallel port is supported in software for interfacing to Centronics-compatible printers. The 1200 and 1600 each support a total of 11 separate DCPs.

DCP software includes a PROM-resident monitor (which provides bootstrapping routines) and the downloaded nucleus (realtime kernel) and supporting application software. The DCP Real Time Nucleus manages all resources of the controller and provides common services to its local applications.

The Modular Communications Processor (MCP) is a communications subsystem which provides remote connectivity to an Areté system for asynchronous devices and connection to a network with full implementation of X.25. The MCP attaches to the DCP via synchronous trunks. These trunks support one to 32 virtual circuits. Up to 8 DCPs can be connected to MCPs, providing for online support of up to 256 users. The MCPs also provide port contention to support additional infrequent users who will also share the 256 virtual circuits.

The MCP supports DCE/DTE for asynchronous communications up to 19.2K baud and supports HDLC/synchronous communications up to 64K baud using line adapters. MCPs ▶

Areté Series 1000

▷ When the system was originally implemented, the system manager said, installation went off without a hitch. The manager explained that the tape drive was shipped directly from Fujitsu and was installed by the system manager without any difficulty. The only problem to date with the Series 1000 has been a faulty power supply pack; the problem was diagnosed and rectified in half a day.

The system manager noted that he had to order terminals and printers from other vendors when originally configuring the system, because Areté does not sell these peripherals. In his opinion though, this did not create any special installation problems.

The manager praised the Series 1000 in general, noting that a potential demand paging problem would be solved with a recent software release of Arix. The user definitely would endorse the machine for users interested in a 32-bit supermicro for use in a demanding I/O environment.

Upon inspection of the Areté machine in the user's computer room, we noted that the Model 1600 runs quietly; however, perhaps any supermicro box would seem quiet when dwarfed by dozens of IBM mainframes, as this one was. The manager explained that no special flooring or cabling was required to install the Model 1600. □

▶ can be connected to each other over synchronous links at 256K baud.

SOFTWARE

OPERATING SYSTEM: The Series 1000 supports AT&T Unix System V, Release 2.2. The Areté version is called the Arix Operating System—Arix Version 4.0. It features a hierarchical tree-structured file system, device-independent I/O, interprocess communication, shared memory, and user command language.

One of the modifications to Unix made by Areté is the support for multiple, tightly coupled Application Processors (APs). This modification is transparent to the user or programmer; however, it allows full-power use of the four APs while running the standard Unix operating system.

In addition to modifications made to support multiple Application Processors, Areté has transferred various functions of Unix away from the master AP and placed responsibility for that processing in the IOPs. The functions of Unix which have been moved to the IOPs are the serial I/O control and the disk/tape I/O control. The DCP does all character-by-character processing, including various data translations known as clist processing. The DP performs all physical-to-logical disk sector translations and sector sparing. This distribution of the operating system frees the APs to perform user tasks more effectively, according to Areté.

DATA BASE MANAGEMENT: Areté supports the *Unify Runtime* and *Complete Data Base* management packages.

LANGUAGES: The Series 1000 supports a number of languages including C, RM-Cobol, Pascal, Fortran-77, and Basic.

COMMUNICATIONS: The Series 1000 supports a variety of communications protocols. These include BSC/3270, 2780/3780, RJE, HASP, SNA, SNA/3270, SNA/3770, Ethernet TCP/IP, X.25, and NFS.

APPLICATIONS: A variety of Unix application packages are available from Areté. A sampling of packages include *Writer's Workbench, PC Works,* and *Ultracalc.* Writer's Workbench and PC Works are word processing packages. Ultracalc is a spreadsheet package.

OPERATING ENVIRONMENT

Nominal operating environment for Areté Series 1000 processors is 41 to 104 degrees Fahrenheit (5 to 32 degrees Celsius) at 20 to 80 percent noncondensing humidity.

Model 1100 is 14 inches wide, 28 inches deep, and 54 inches high. The 1100 weighs 337 pounds. Models 1200 and 1600 are 21.5 inches wide, 34 inches deep, and 55 inches high; each model weighs 527 pounds.

Power requirements for the Model 1100 are line voltage of 115 VAC ± 10 percent or 220 VAC ± 10 percent, with a line frequency of 47 Hz to 63 Hz and power output of 1,250 watts.

Power specifications for Models 1200 and 1600 include line voltage of 220VAC ± 10 percent and line frequency of 47 Hz to 63 Hz and power output of 1,850 watts.

SUPPORT SERVICES

DOCUMENTATION: Series 1000 manuals for purchase include *Series 1000 Technical Description, Series 1000 Site Preparation Guide,* and *Series 1000 Installation/Verification Manual.* Operating system manuals include *Complete Unix System V.2 Manual Set, Introduction to Unix,* and 11 manuals dealing with Unix System V.2 system details. Manuals are also available on languages, data base management systems, and applications.

TRAINING/EDUCATION: Areté offers user training sessions on an ongoing basis at its San Jose, California facility.

MAINTENANCE: A monthly maintenance plan is available for Series 1000 hardware and software.

PRICING

POLICY: The Series 1000 is offered for sale on a purchase-only basis. Complete equipment and software prices follow. ▶

Areté Series 1000

EQUIPMENT PRICES

		List Price ($)	Monthly Maint. ($)
PACKAGED SYSTEMS			
1100/PSI	Model 1100/PSI includes 900 cabinet, 1000/C32 68020 Application Processor with floating-point, 4MB memory, three 1000/GC8-256 Data Communications Processors, 1000/PAR/port parallel port (1 per 1000/GC8-256), 1000/DT2 SMD Data Base Processor, 1000/DMC4/2 DMA bus memory controller, 1000/d168 160MB disk drive, 1000/t45 45MB cartridge tape drive, and 1000/PS-0.6K 650 W power supply (110 V only)	45,680	263
1200/PSI	Model 1200/PSI includes 1200 cabinet, 1000/C32 68020 Application Processor with floating-point, 1000/m4 4MB memory, one 1000/GC8-256 Data Communications Processor, 1000/PAR/port parallel port (1 per 1000/GC8-256), 1000/DT2 SMD Data Base Processor, 1000/DMC2 DMA bus memory controller, 1000/d168 160MB disk drive, 1000/t45 45MB cartridge tape drive, and 1000/PS-2.2K 1800 W power supply (220 V only)	55,254	241
1600/PSI	Model 1600/PSI includes 1600 cabinet, 1000/C32 68020 Application Processor with floating-point, 1000/m4 4MB memory, one 1000/GC8-256 Data Communications Processor, 1000/PAR/port parallel port (1 per 1000/GC8-256), 1000/DT2-9T, nine-track SMD Data Base Processor, 1000/DMC2 DMA bus memory controller, 1000/d168 160MB disk drive, 1000/9TC-MP, nine-track tape drive, and 1000/PS-2.2K 1800 W power supply (220 V only)	67,154	294
PROCESSORS			
1000/C16	68000 Application Processor	4,600	18
1000/C32	68020 Application Processor	10,400	41
1000/C32U	68020 upgrade	7,800	NA
CABINET ACCESSORIES			
1100/BASIC	Two Application Processor cabinets with card cage, power distribution system, control panel, and base plate	3,600	11
1200/BASIC	Four Application Processor cabinets with card cage, power distribution system, and control panel	7,000	21
1600/IP	Four Application Processor cabinets with card cage, power distribution system, and control panel	7,000	21
1100, 1200/EXP	Expansion cabinet	3,900	121
MASS STORAGE			
1000/M2	2MB of memory	3,800	11
1000/M4	4MB of memory	5,300	23
1000/M8	8MB of memory	9,010	46
1000/DT2	SMD Data Base Processor (4 SMD)	9,100	36
1000/DT2-9T	9-track tape/SMD Data Base Processor	10,500	42
1000/DMC2	DMA bus/memory controller (2 channel)	5,000	15
1000/DMC4	DMA bus/memory controller (4 channel)	14,500	58
1000/D168	160MB disk drive	9,750	48
1000/D337	337MB disk drive	13,500	135
1000/D689	689MB disk drive (requires 1200/EXP)	24,800	248
OPTICAL DISK			
1000/OP	1GB optical disk (requires 1200/EXP; includes SCSI host adapter)	31,200	390
MAGNETIC TAPE			
1000/T45	45MB cartridge tape (requires 1000/DT2)	2,100	13
1000/9T-HP	9-track tape drive, 1600/6250 bpi (requires 1000/DT2-9T)	24,100	120
1000/9T-MP	9-track tape drive, 1600/3200 bpi (requires 1000/DT2-9T)	11,900	60
1000/9TC-MP	9-track tape drive with cache, 1600/3200 bpi (requires 1000/DT2-9T)	11,900	60
DATA COMMUNICATIONS			
1000/GC8-256	Sync/async Data Communications Processor, 256KB of RAM	4,500	18
1000/mba	Multibus adapter	2,775	11
1000/PAR/Port	Parallel port (1 per 1000/GC8-256)	250	2
1000/exos	Ethernet (includes board, transceiver, transceiver cable, and software)	9,220	96
1000/adax	X.25/DNN interface board (incudes termination panel and cabling)	3,600	19

NA—Not applicable.

Areté Series 1000

		List Price ($)	Monthly Maint. ($)

COMMUNICATIONS PROCESSOR

		List Price ($)	Monthly Maint. ($)
1000/mcp/c5110	5-card chassis, 110 V	2,830	—
1000/mcp/c5220	5-card chassis, 220 V	2,830	—
1000/mcp/c5/rm	5-card rack-mount kit	280	—
1000/mcp/c19110	19-card chassis with PS 110	8,490	—
1000/mcp/c19220	19-card chassis with PS 220	8,490	—
1000/mcp/c19/dp	19-card chassis with redunt PS	14,150	—
1000/mcp/alc16	16-channel async line card	3,770	—
1000/mcp/slc2	2-channel sync line card	3,770	—
1000/mcp/v35lc	V.35 line card	4,720	—
1000/mcp/v11lc	V.11 line card	4,720	—
1000/mcp/sw	Switching module	1,890	—
1000/mcp/ppmux	Point-to-point multiplexing	2,830	—
1000/mcp/x.25	X.25 Public Network Interface	4,720	—
1000/mcp/cs16	16KB configuration storage	950	—
1000/mcp/cs64	64KB configuration storage	1,130	—

POWER SUPPLIES

		List Price ($)	Monthly Maint. ($)
1000/PS-1.6K	Medium 1000 W, 110 VAC (1100 only)	3,900	20
1000/PS-2.2K	Large 1800 W, 220 VAC/240 VAC (1200/1600 only)	5,100	26
1000/UPS-1K	Battery backup, 1KVA	3,800	34
1000/UPS-3K	Battery backup, 3KVA	14,900	134

NA—Not applicable.

SOFTWARE PRICES

		List Price ($)	Monthly Maint. ($)

OPERATING SYSTEM

		List Price ($)	Monthly Maint. ($)
1000/arix/16	Arix System V.2, 16 user	3,700	62
1000/arix/24	Arix System V.2, 24 user	4,300	72
1000/arix/32	Arix System V.2, 32 user	5,600	93
1000/arix/40	Arix System V.2, 40 user	6,500	108
1000/arix 48	Arix System V.2, 48 user	6,900	115
1000/arix/56	Arix System V.2, 56 user	7,500	125
1000/arix/64	Arix System V.2, 64 user	8,500	142
1000/arix/65	Arix System V.2, 65 or more users	11,500	192

LANGUAGES

		List Price ($)	Monthly Maint. ($)
1000/C1	Enhanced C Development Environment	900	15
1000/Pascal	SVS Pascal Compiler	2,100	35
1000/Fortran	SVS Fortran-77 Compiler	2,100	35
1000/XBasic	SVS DEC-compatible XBasic+ Interpreter	3,100	52
1000/svsc	SVS C	2,100	35
1000/Cobol/C	RM/Cobol Development Environment	2,000	33
1000/Cobol/RT	RM/Cobol Runtime Only Interpreter	600	10
1000/smcb/8	SMC Basic, 1-8 users	435	7
1000/smcb/16	SMC Basic, 9-16 users	875	15
1000/smcb/32	SMC Basic, 17-32 users	1,425	19
1000/smcb/64	SMC Basic, 33-64 users	2,745	41
1000/smcb/65	SMC Basic, 65 or more users	5,495	92

COMMUNICATIONS

		List Price ($)	Monthly Maint. ($)
1000/SDLC/SNA	SDLC/SNA Interface	2,000	33
1000/3270/SNA	3270 SNA Communications Utility (license for 3270/SNA or 3770/SNA requires a license of 1000/SDLC/SNA for each system being licensed)	1,500	25
1000/3770/SNA	3770 SNA Communications Utility (license for 3270/SNA or 3770/SNA requires a license of 1000/SDLC/SNA for each system being licensed)	1,500	25
3270/BiSync	3270 BiSync Communications Utility	2,500	42
1000/comm	2780/3780 Communications	2,100	35
1000/adax/x25	X.25	2,200	37
1000/adax/ddn	DDN Software	2,200	37
1000/adax/uucp	Network uucp	760	13

Note: Operating system software includes 1000/Arix/um, 1000/Arix/ag, and 1000/Arix/emm manuals.
NA—Not applicable.

Areté Series 1000

		List Price ($)	Monthly Maint. ($)
DATA BASE MANAGEMENT			
1000/unify	Unify (complete data base)	3,000	50
1000/unirun	Unify Runtime	1,500	25
APPLICATIONS			
1000/wwb/8	Writer's Workbench, 1-8 users	300	5
1000/wwb/16	Writer's Workbench, 9-16 users	450	7
1000/wwb/32	Writer's Workbench, 17-32 users	750	13
1000/wwb/64	Writer's Workbench, 33-64 users	1,050	18
1000/wwb/65	Writer's Workbench, 65 or more users	1,650	28
1000/uni	Unihost	595	NA
1000/pcw	PC Works (requires 1000/uni)	195	NA
1000/mac	MacLine (requires 1000/uni)	195	NA
1100/ultra	Ultracalc for Series 1100	1,425	24
1200/ultra	Ultracalc for Series 1200	2,195	37

Note: Operating system software includes 1000/Arix/um, 1000/Arix/ag, and 1000/Arix/emm manuals.
NA—Not applicable. ∎