Charles River Data Systems

MANAGEMENT SUMMARY

Charles River Data Systems' three supermicrocomputer families include the Universe 32 Family, Universe 68 Family, and Universe 2400 Family. The Universe 32 Family includes five models; the Universe 68 has six models; and the Universe 2400 Family is made up of two models. Models in the Universe 32 Family include 32/35F-E, 32/35T-E, 32/37N-E, 32/115T-E, and 32/137T-E. Universe 68 models include 68/05-E, 68/35F-E, 68/35T-E, 68/37N-E, 68/115T-E, and the 68/137T-E. The Universe 2400 Family consists of two models, the 2402F-E and the 2403FT-E.

The Universe 68 is based on a Motorola 68000 microprocessor and supports up to 64 users. The Universe 32 is an upgraded Universe 68 system with a Motorola 68020 microprocessor chip and supports up to 64 users; it employs the Versabus for I/O, like the Universe 68. The Universe 2400 Family is a 32-bit computer system based on the VMEbus and has been ruggedized for use in demanding industrial, laboratory, and office environments.

All three families can be clustered on the Charles River network, UniverseNet, with global access to each other and to each system's resources. All three families can run under either Unos, Charles River's proprietary operating system, or under the UN/System V operating system, based on AT&T's Unix System V. Peripherals are interchangeable throughout the three families.

The Universe 32 Family is the top-of-the line Charles River supermicrocomputer. The Universe 32 is based on a Motorola 68020 chip which, according to Charles River, operates at 2.7 MIPS. The basic system includes 1MB of main

Charles River Data Systems' Universe family of supermicrocomputers shares a common architecture, bus structure, and peripherals. All the systems employ Motorola microprocessors in their CPUs. The Universe 32, the Universe 68, and Universe 2400 also share a common Unix operating system.
MODELS: Universe 32/35F-E, UV32/35T-E, UV32/37N-E, UV32/115T-E, UV32/137T-E; UV68/05-E, UV68/35F-E, UV68/35T-E, UV68/37N-E, UV68/115T-E, UV68/137T-E; UV2402F-E, UV2403FT-E.
MEMORY: 1MB to 12MB.
DISK CAPACITY: 10MB to 2.4GB.
WORKSTATIONS: Up to 64 users.
PRICE: $9,999-$35,200 (base systems).

CHARACTERISTICS

VENDOR: Charles River Data Systems, 983 Concord Street, Framingham, MA 01701. Telephone (617) 626-1000.

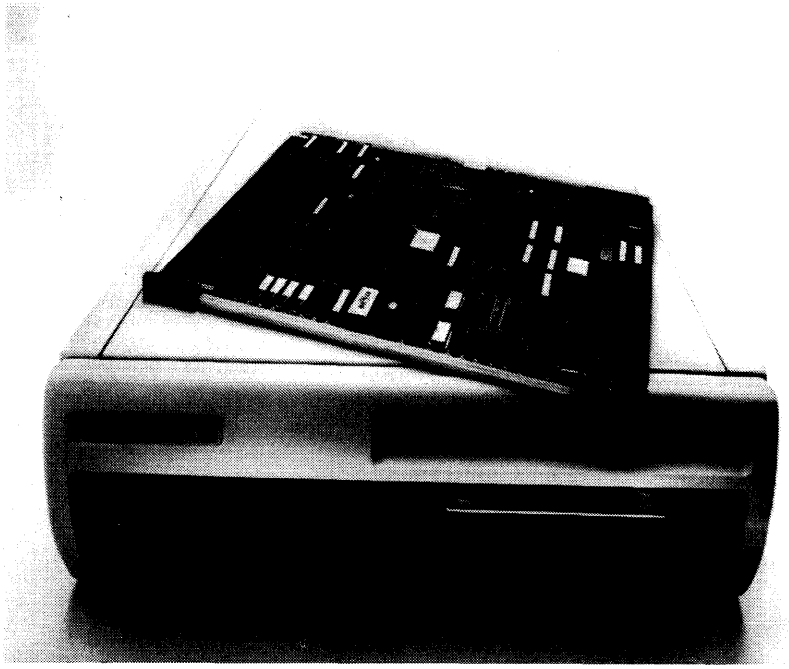
DATA FORMAT

BASIC UNIT: 32-bit word.

INTERNAL CODE: ASCII.

MAIN STORAGE

The Universe 32/115 and Universe 68/35 memory management units (MMU) provide logical segmentation of process address spaces for multiprocessing operation. Protection between processes is provided to maintain system integrity.



Charles River Data Systems' 32-bit Universe 32 is based on a Motorola 68020 microprocessor and Unix System V. The Universe 32 supports up to 2.4GB of disk storage and up to 12MB of main memory, and can be equipped with a 1MB floppy disk, a 45MB streaming tape, and a 35MB, 115MB, or 400MB Winchester disk.

Charles River Data Systems

CHART A. SYSTEM COMPARISON

MODEL	Universe 32 Family	Universe 68 Family	Universe 2400 Family
SYSTEM CHARACTERISTICS			
Date of introduction	July 1985	October 1982	April 1985
Date of first delivery	August 1985	January 1983	June 1985
Microprocessor type	68020	68000	68000
Microprocessor cycle time	12.5MHz	12.5MHz	12.5MHz
Operating system	UN/System V; Unos	UN/System V; Unos	UN/System V; Unos
Upgradable from	Universe 68	Does not apply	Does not apply
Upgradable to	Does not apply	Universe 32	68020
Number of users	64	64	4
Number of serial/parallel I/O ports	4-64	4-64	4-1024
Number of expansion slots	5	5	12
MEMORY			
Minimum capacity (bytes)	1M	1M	1M
Maximum capacity (bytes)	12M	12M	12M
DISK STORAGE			
Minimum capacity (bytes)	35M	10M	20M
Maximum capacity (bytes)	2.4G	2.4G	20M Winchester; 1.2M floppy; ¼-inch tape on 2403FT
NUMBER OF WORKSTATIONS	—	—	9
COMMUNICATIONS PROTOCOLS	UniverseNet (ISO/Map-Top), SNA	UniverseNet (ISO/Map-Top), SNA	UniverseNet (ISO/Map-Top), SNA

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

memory, an inbuilt 35MB Winchester disk, a 1MB floppy disk drive, and four serial ports. The memory capacity is targeted for multiprocessing, timesharing, and realtime environments. The Universe 32 can be expanded to a maximum of 12MB of memory. Disk storage ranges from 35MB to 2.4GB. While workstations are not included with the base system, up to 64 users can work on the system concurrently. The Universe 68 can be upgraded to the Universe 32 Family.

The Universe 68 Family, based on the Motorola 68000 central processor, operates at 1.25 MIPS, according to Charles River. A second 68000 microprocessor controls character-oriented devices. This system is targeted for multiprocessing timesharing environments. A 35MB 5¼-inch Winchester disk and a 1.25MB 8-inch floppy disk are built into the package. Maximum memory capacity is 12MB, while disk capacity is 2.4GB. The maximum number of system users supported is 64.

The Universe 2400 Family is based on the Motorola 68000 chip and is packaged for harsh environments, such as a factory floor. It is resitant to moisture and particulate matter and is reportedly less likely to disconnect when subjected to vibration and rough handling. The Universe 2400 uses the 32-bit VMEbus. Memory capacity can be expanded to 2MB; the system supports a 20MB Winchester disk, a 1.2MB floppy, and a ¼-inch tape drive. Nine workstations can be attached to the system. The Universe 2400 can be upgraded to a Universe 32.

Available for connecting the Universe systems is Charles River's proprietary LAN, UniverseNet. UniverseNet is an open-system network architecture. UniverseNet contains a range of application facilities.

The operating system for the three Charles River families is either UN/System V or Unos. UN/System V has been

For the Universe 32/115T-E, the process space is divided into 16 sequential segments of 2MB each. These provide protection and are allocated to text/instruction space, stack, local data, global/shared data, I/O page access, and dual-port non-cached direct memory access (DMA). Allocation and access are under program control as part of the realtime capabilities of the operating system. The memory system allows a single device to make 16-bit transfers at 5.3MB per second and 32-bit transfers at 10.6MB per second. The bus can support an aggregate data rate of 20MB per second.

For the Universe 68/35 (both models), one of the user MAP segments is reserved for the process stack, and a second segment is used for extended hardware facilities, such as arithmetic processors. Other segments provide local or shared instruction and data areas. The selector channel interface provides an additional level of concurrent processing. The SASI/SCSI bus is used on the selector channel to allow configuration of a range of burst-mode devices. The central processor provides bus arbitration, allowing concurrent processing and data transfer. The memory cycle allows a single device to make 16-bit burst transfers at 4.2MB per second and 32-bit burst transfers at 8.4MB per second. The bus can support an aggregate data rate of up to 20MB per second.

For the VCP-2000 central processor on Models 2403FT-E and 2402F-E, the MAP logic provides two functions. First, it allocates memory on a logical basis, permitting programs to load and/or swap into any area of physical memory for programs. Eight segments are available for each process. This permits sharing and/or local access of instructions and data. Second, the MAP logic provides protection between segments of various processes. This includes write protection for pure instruction space and "invalid" protection for references outside the logical address space of a user. An additional set of eight segments is provided for system operations, permitting protection of system data structures and providing logical windows between system and user address spaces.

PROCESSING COMPONENTS

The Universe 32/115T-E is built around a Motorola 68020 microprocessor with 4KB cache. The central processor is on a single VLSI chip, which reduces part count. The CPU

Charles River Data Systems

CHART B. DISK/DISKETTE DEVICES

MODEL	DK60T/120T	Floppy Drive	DK-400
Type	Winchester	Floppy disk	Winchester
Size (inches)	5½	8	5½
Number of surfaces	—	—	—
Formatted capacity per drive (bytes)	60M/120M	1.26M	400M
Interface/controller	—	—	—
Number of drives per interface/controller	—	—	—
Average access time	28 ms	150 ms	18 ms
Data transfer rate	1.2MB per sec.	62KB per sec.	1.8MB per sec.
Sectors/tracks per surface	—	—	—
Bytes per sector/track	—	—	—
Comments	Supported by Universe 68, 32, and 2400	Supported by Universe 32 and 68	Supported by Universe 32, 68, and 2400

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

designed to control five programming environments: realtime, timesharing, multitasking, dedicated, and batch processing. UN/System V supports a 16MB address space, which allows users to take advantage of main memory for any mix of instructions and data. Unos is a Unix-compatible operating system with extensions for realtime and runtime environments. Unos is the kernel for UN/System V.

Languages available for Charles River Data Systems include the C language, Fortran 77, Pascal, RM/Cobol (Ryan-McFarland Corporation's implementation of ANSI 74 standard Cobol), and Basic II. To date, Charles River has not developed quantities of proprietary application and data base management software for the system; most of the software the company offers has been developed by third-party vendors.

COMPETITIVE POSITION

Competition for Charles River Data Systems comes from Digital Equipment Corporation's MicroVAX II and AT&T's 3B2/300 and 400 supermicrocomputers.

Both the Charles River systems and Digital Equipment's MicroVAX II are targeted for scientific and engineering applications (the MicroVAX II is also targeted for the commercial marketplace) and both are 32-bit systems. The top-of-the-line Charles River Universe 32 Family, Model 32/137T-E, beats out the MicroVAX II in memory and disk capacity. The Model 32/137T-E has a memory capacity of 12MB versus 9MB for the MicroVAX II. And, the disk capacity of the Charles River system is 2.4GB, while the MicroVAX II can configure up to 1.8GB of disk storage.

With regard to the number of users the systems can handle, the Charles River system can configure up to 64 users. The Digital MicroVAX II can handle about half that number, touting up to 33 workstation users on the system.

AT&T competes with the Universe 32 system. AT&T's 3B2/400 supermicro is a 32-bit system that also runs Unix System V. Again, the Charles River Universe 32 outdistances the competition in memory and disk capacity; the 3B2/400 can configure only up to 4MB of memory and about 100MB of disk capacity. Although the Universe 32

employs 9-inch by 14-inch Versabus-standard printed circuit boards. The optional ECC memory available with the Universe 32/115 provides error correction as well as detection, and permits continued operation. On read operations, the instruction/data cache provides a zero wait state response on cache hits and eliminates the need for bus access. On wait operations the store queue provides for a zero wait state, permitting the processor to continue and to run asynchronously from bus traffic.

The Universe 68/35 (both models) is based on the Motorola 68000 processor with 4KB cache memory. The 32-bit Versabus allows direct channel access to all memory for DMA peripherals. A second 68000 microprocessor controls character-oriented devices. A 35MB, 5¼-inch Winchester disk and a 1.25MB, 8-inch floppy disk are built into the package.

The Universe 2400 (both models) is also based on the Motorola 68000 processor. The 4KB, 45 nanosecond static RAM cache takes data from memory in 32-bit transfers and provides 45 nanosecond accesses from the processor. CPU features include a CMOS calendar/clock with on-board battery, up to 16KB of PROM for system initialization and diagnostics, independent user/system memory allocation, and protection.

INPUT/OUTPUT CONTROL

The Universe 32/115T-E contains five Versabus board slots. Three are used by the processor board, the selector channel interface, and a memory board. For the Universe 68/35 (both models), four serial ports are built into the processor board, all utilizing DMA serial port control. The SASI/SCSI bus is used on the selector channel to allow configuration of a range of burst-mode devices. The central processor provides bus arbitration, allowing concurrent processing and data transfer. The memory cycle allows a single device to make 16-bit burst transfers at 4.2MB per second and 32-bit burst transfers at 8.4MB per second. The bus can support an aggregate data rate of up to 20MB per second. Disk system capacity can be expanded by the addition of a selector channel interface for expansion to external disk subsystems. An IEEE 488 bus interface and an adapter board for connection to Multibus boards are also available. The 32-bit Versabus allows direct channel access to all memory for DMA peripherals. A second 68000 microprocessor controls character-oriented devices. These are controlled by a selector channel interface board. The 32-bit, channnel-oriented controller provides throughput for the internal disk units.

The Universe 2400 (both models) also has four serial ports built into the processsor board. In addition, up to 16 I/O processors can be added. Each I/O processor has a 12.5MHz 68000 and can support up to 64 serial ports.

Charles River Data Systems

can handle more users than the AT&T supermicro (64 versus 25 for the 3B2/400), of note is the fact the 3B2/400 can be enhanced. The 3B2/400 can configure another processor chip, the WE 32106, in addition to its WE 32100 processor chip. The enhanced chip is a math accelator unit for enhanced floating-point operations. At this time, Charles River does not offer an enhanced floating-point processor; that lack could be disadvantageous in some scientific and engineering environments.

ADVANTAGES AND RESTRICTIONS

By employing the industry-standard 32-bit Versabus in the Universe 32 and 68 Families, Charles River is adhering to a nonproprietary bus, allowing configuration of a range of third-party peripherals. The 2400 family is based on the VMEbus, according to the company, because it believes the VMEbus will have IEEE support and a number of implementations in a few years. Charles River maintains it is desirable to implement a bus that provides the widest selection of devices; the VMEbus allows for freedom of reconfiguration.

Another positive advantage of the Charles River Systems is the ability to swap microprocessor boards to upgrade the systems. For example, a Universe 68 or 2400 system can be upgraded to a Universe 32 by switching the Universe 68 MC68000 board to an MC68020 microprocessor board. Therefore, Universe 68 users can easily upgrade in the Charles River family when they outgrow the Universe 68. In conjunction with easily upgradability, Universe systems can be clustered on a network (UniverseNet) with global access to resources on any system in the cluster. Universe clusters can combine Universe 32, Universe 68, and VMEbus-based 2400 Universe systems.

With the Universe family based on the Unix operating system, the Unix base allows it to use a growing number of software packages for various applications

USER REACTION

Because Datapro's 1985 Computer Users Survey did not include supermicros, we received no responses for the Universe systems. Charles River Data Systems did not supply Datapro with a list of users we could contact for assessments of systems. □

CONFIGURATION RULES

Each basic Universe 32/115T-E is configured with 115MB of Winchester disk storage, the 68020 processor with 4KB of cache, 1MB of main memory, the 68000-based I/O processor, 4 serial ports, and a 5-slot Versabus backplane. Use of 1MB to 4MB memory boards permits expansion up to 12MB in the seven-inch chassis. For removable media the Model 115T contains a 45MB ¼-inch streaming tape drive.

The Universe 68 product line offers a compatible range of systems, in addition to the Universe 68/35T-E and 68/35F-E. These include models with disk systems of 32, 80, or 120MB fixed storage, and either 45MB tape or floppy backup capabilities. The Universe 68/35 (both models) contains 5 Versabus board slots. Three are used by the processor board, the selector channel interface, and a memory board. Main memory may be expanded, in blocks of one megabyte (ECC) or smaller increments, up to 4MB. Use of four-megabyte boards permits expansion up to 12MB in the Universe 68/35 7-inch chassis. Disk capacity can be expanded by the addition of a selector channel interface for expansion to external disk subsystems.

The two basic models offered in the Universe 2400 Family—the 2402F-E and 2403FT-E—use the same packaging and offer the same expansion options. Both systems incorporate a 1.2MB floppy disk, a VCP-2000 processor with 4KB of cache, a 12.5MHz 68000 processor, a VCC-1 SCSI/SASI controller that is 68000-based, and a 12-slot VME backplane. The 2403FT-E also includes 1MB of system RAM, 35MB Winchester disk, 8 VME slots, and a ¼-inch streaming tape. The 2402F-E includes 512KB of system RAM, 7 VME slots, and a 20MB Winchester disk.

Both the Versabus and VME systems support disk expansion on SMD and SCSI bus (up to 2.4GB maximum), JOP/Ethernet (8023) and MAP (802.4) network interfaces, and ½-inch tape.

Maximum configuration limits for the Charles River Data Systems include up to 64 serial ports, 7 parallel ports, 12MB of RAM, 2.4GB of Winchester disk storage, and four ½-inch tape units. (For the 2400 Family, up to 1,024 serial ports can be configured.)

INPUT/OUTPUT UNITS

See Chart B for disk and diskette drives.

Charles River Data Systems does not at this time offer either workstations or printers and recommends that prospective users contact third-party vendors for these peripherals.

The 32/115T-E has a 45MB ¼-inch streaming tape built into the model; the streaming tape is also compatible on both the Universe 68 and 2400 systems. The storage devices are controlled by a selector channel interface board.

COMMUNICATIONS

Communications support is expanded on a separate bus using a board that mounts outside the card cage. This communications bus permits expansion to 64 communications ports without reducing the availability of Versabus slots.

Model TP-308 is a full-duplex, user-programmable data communications device. It includes eight serial and one parallel port and operates at up to 38.4K bps per port. The interface is RS-232-C or RS-422 selectable. Ports may be programmed as async, sync, HDLC, or SDLC.

For the VCP-2000 central processor in Models 2403FT-E and 2402F-E, four serial ports are incorporated on the processor board, providing terminal and printer interfaces. Each port can be programmed for baud rate (50-38,400 baud), number of bits, and parity. One port can be programmed for modem and synchronous operations.

SOFTWARE

OPERATING SYSTEM: Charles River Data Systems' supermicrocomputers are supported by either the Unos or the UN/System V operating system. Unos is Charles River Data Systems' proprietary realtime operating system that is compatible with AT&T Unix. The UN/System V is an implementation of the AT&T Unix System V.

Charles River Data Systems

A common kernel implementation is used and files are transportable between systems, as are object code, device drivers, and network connections. Both UN/System V and Unos comply with system calls and subroutines as defined in the 1984 /usr/group Standard. Unos realtime functions include priority scheduling, resident process locking, direct I/O control, shared data, user device driver support, contiguous files, IPC, and eventcount synchronization. Unos is developed for independent, Unix-compatible run-time environments, as well as an independent, Unix-compatible development environments.

Both operating systems employ the same hierarchical file structure, record/file locking schemes, kernel system calls, and subroutines. Regardless of the operating system used as the development vehicle, programs developed will run on either operating system with files that are portable between the two systems.

Both a Sort and Text Editor are included among the Unos system utilities.

DATA BASE MANAGEMENT: Charles River offers a version of Unify Corporation's Unify relational DBMS. The package integrates programs including: Paint, for interactive screen format design; SQL (Structured Query Language); QBF (Query By Forms); RPT, a report writer; and DML (Data Manipulation Language).

LANGUAGES: Available languages include C, Fortran 77, Pascal, RM/Cobol, and Basic II.

COMMUNICATIONS: Expansion is provided through the UniverseNet networking facilities. This IEEE 802.3 Ethernet-based connection can link multiple products in the Universe families. The International Standards Organization (ISO) standard protocols implemented by Charles River with UniverseNet also provide connection into multivendor networks. Networking facilities supported by UniverseNet include process-to-process connection, file transfer, remote execution, remote printing, remote device mounting and access, eventcounts to synchronize processes, virtual terminal connections, and distributed file access and distributed processing. Support for SNA 3270 is also available.

Available for connecting the Universe systems is Charles River's proprietary LAN, UniverseNet. UniverseNet is an open-system network architecture. The system allows for wide area networks, LANs, and gateways to other networks. UniverseNet allows users in a Unix-compatible environment to share resources and information among other systems, communicate among themselves, work within a distributed environment, and add different network protocol and media types. UniverseNet contains a range of application facilities that enlarge user interaction within network applications, including messaging, electronic mail, printer resource sharing, and file transfer.

APPLICATIONS: Over 200 application packages are available for the Charles River data systems, including word processing, spreadsheets, and a variety of focused application packages. These packages are contained in a Charles River software catalog.

OPERATING ENVIRONMENT

The Universe 32/115T-E and Universe 68/35 (both models) are desktop models with optional rack mount slides. Both models measure 7 inches high by 19 inches wide by 27 inches deep. The ideal operating environment for both systems consists of a temperature range from 35 to 95 degrees Fahrenheit and a relative humidity range from 20 percent to 80 percent (noncondensing). AC power is 110 V/60 Hz, 5 amp and 220 V/240 VAC/50 Hz, 2.5 amp for the Universe 32/115T. AC power for the Universe 68/35 is 120 V/60 Hz, 5 amp, and 220 V/240 V/50 Hz, 2.5 amp.

The Universe 2400 (both models) measures 10.5 inches high by 17.5 inches wide by 21 inches deep. For tabletop or rack mounting, an upright mounting 22 inches high, 12 inches wide, and 21 inches deep is also available. The operating environment for the Universe 2400 is between 32 and 104 degrees Fahrenheit. The unit will operate at altitudes ranging from −200 to 10,000 feet and at noncondensing humidity levels between 20 and 80 percent. The power supply is selectable between 50/60 Hz and 100 to 240 volts. The unit can also be run off a power transformer from 12-, 24-, or 48-volt DC sources.

SUPPORT SERVICES

DOCUMENTATION: Hardware and software manuals are supplied with all systems.

TRAINING/EDUCATION: Training is available through Charles River Data Systems.

MAINTENANCE: Full-service maintenance is available.

PRICING

POLICY: Systems are available for sale through Charles River and lease terms are also available through third parties. Warranties are on a 90-day basis. Software prices are based on a one-time charge schedule, with annual update services available.

EQUIPMENT PRICES

		Purchase Price ($)
BASIC SYSTEMS		
UV68/05-E	68 system with 1MB RAM memory; 10MB disk and floppy; 4 serial ports; integral IOP; and Versabus.	14,950
UV68/35F-E	68 system with 1MB RAM memory; 35MB disk; floppy; single 7-inch box; 4 serial ports; integral IOP; and Versabus.	16,700
UV68/35T-E	68 system with 1MB RAM memory; 35MB disk; ¼-inch tape; single 7-inch box; 4 serial ports; integral IOP; and Versabus.	18,700
UV68/37N-E	68 system with 1MB RAM memory; 35MB disk; floppy; two 7-inch boxes; 4 serial ports; integral IOP; and Versabus.	18,700
UV68/115T-E	68 system with 1MB RAM memory; 115MB disk; ¼-inch tape; single 7-inch box; 4 serial ports; integral IOP; and Versabus.	25,000
UV68/137T-E	68 system with 1MB RAM memory; 120MB disk; ¼-inch tape; two 7-inch boxes; 4 serial ports; integral IOP; and Versabus.	28,700
UV32/35F-E	32 system with 1MB RAM memory; 35MB disk; floppy; single 7-inch box; 4 serial ports; integral IOP; and Versabus.	23,200

Charles River Data Systems

		Purchase Price ($)
UV32/35T-E	32 system with 1MB RAM memory; 35MB disk; ¼-inch tape; single 7-inch box; 4 serial ports; integral IOP, and Versabus.	25,200
UV32/37N-E	32 system with 1MB RAM memory; 35MB disk; floppy; two 7-inch boxes; 4 serial ports; integral IOP; and Versabus.	25,200
UV32/115T-E	32 system with 1MB RAM memory; 115MB disk; ¼-inch tape; single 7-inch box; 4 serial ports; integral IOP; and Versabus.	31,500
UV32/137T-E	32 system with 1MB RAM memory; 120MB disk; ¼-inch tape; two 7-inch boxes; 4 serial ports; integral IOP; and Versabus.	35,200
UV2402F-B	2402, 12-slot VME, with 512KB RAM; 20MB disk; and floppy. Upright/wall/rack-mountable 12-slot industrial strength package.	9,999
UV2402F-E	2402, 12-slot VME, with 1MB RAM memory; 20MB disk; and floppy. Upright/wall/rack-mountable 12-slot industrial strength package.	11,200
UV2402F-F	2402, 12-slot VME, with 2MB RAM memory; 20MB disk; and floppy. Upright/wall/rack-mountable 12-slot industrial strength package.	13,200
UV2402F-G	2402, 12-slot VME, with 4MB RAM memory; 20MB disk; and floppy. Upright/wall/rack-mountable 12-slot industrial strength package.	16,200
UV2403FT-E	2403FT provides 35MB of formatted disk and includes a 45MB ¼-inch tape; 1MB RAM memory.	17,000
UV2403FT-F	2403FT provides 35MB of formatted disk and includes a 45MB ¼-inch tape; 2MB RAM memory.	19,000
UV2403FT-G	2403FT provides 35MB of formatted disk and includes a 45MB ¼-inch tape; 4MB RAM memory.	22,000
MEMORY		
CM-1024/VCM	1MB parity memory board (Versabus/VME)	1,500
CM-2MB/VCM	2MB parity memory board (Versabus/VME)	2,500
CM-4MB/VCM	4MB parity memory board (Versabus/VME)	4,000
MASS STORAGE		
DK-400	400MB disk subsystem	25,000
COMMUNICATIONS		
TP-308/7	8 serial ports, parallel port	1,400
NC-1/VNC-1	802.2/802.3 (Ethernet) controller (Versabus/VME)	3,600

SOFTWARE PRICES

		Purchase Price ($)
BASIC SYSTEM SOFTWARE		
UN/SystemV-01	Operating system derived from Unix System V, with C development, 1-16 users	4,000
UN/FORT-01	Initial Fortran 77 development license	950
UN/Pas-01	Initial Pascal development license	950
UN/BasII-01	Initial Basic II license	950
RM/Cobol-01	Initial RM/Cobol development license	950
UniverseNet	Initial license for ISO standard networking (requires UN/System V or Unos, 802.3 interface and 802.3 driver-$500)	1,500
UNOS-01	Unos operating system kernel and utilities	3,000
UN/C-01	Initial C language development license (Unos)	500
UN/IX-Tools-01	Unix System V tool set and utilities (for Unos)	1,200

Charles River Data Systems

Product Enhancement

Charles River Data Systems has added to its family of supermicrocomputers with the announcement of the Universe 2600. The Universe 2600 is positioned as the largest multiuser Charles River system, ahead of the Universe 68, 32, and 2400 systems.

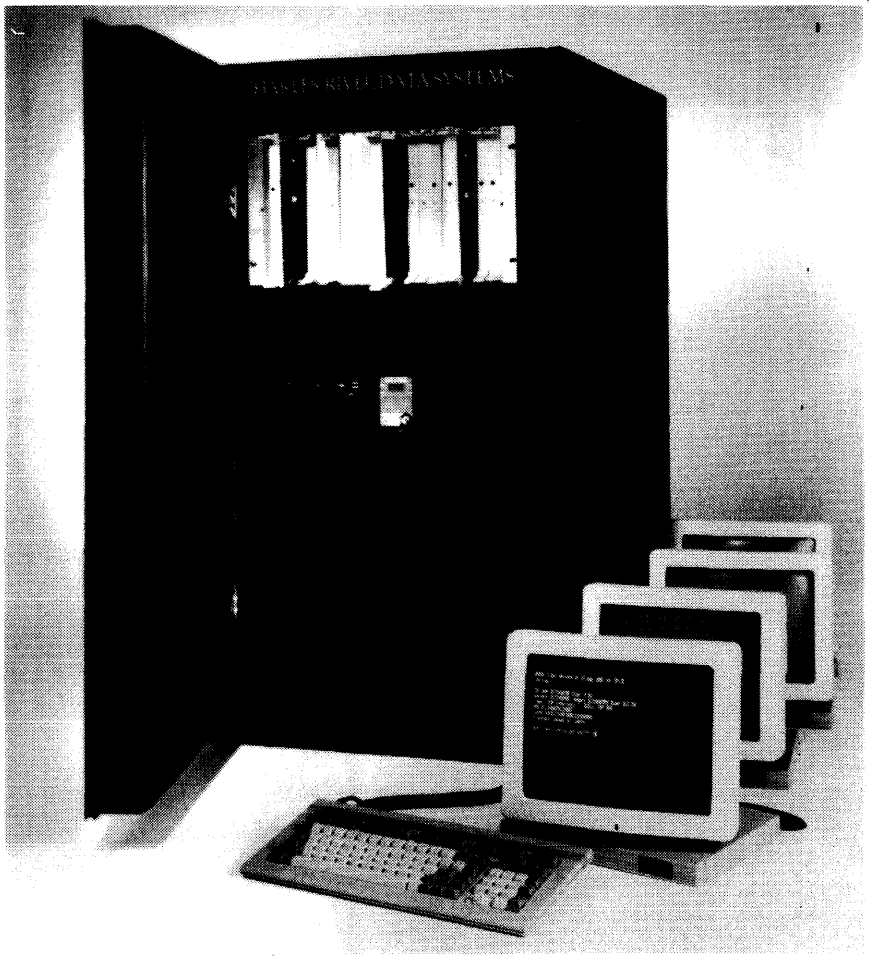
The Universe 2600 can support over 1,064 serial communications devices, or 100 users simultaneously active. The 32-bit Universe 2600 is designed for industrial automation and transaction processing applications. The Universe 2600 increases the Charles River product line to four families, enlarging the company's Unix-based system selections.

The Universe 2600 is built around the VMEbus and the Motorola MC68000 microprocessor. A typical configuration includes one megabyte of main memory, a 45MB ¼-inch streaming tape unit, a 140MB (115MB formatted) 5¼-inch Winchester disk, and four serial ports.

The Universe 2600 has a 32-bit internal data path and a 4KB data and instruction cache, which enables it to execute 1.25 million instructions per second (MIPS) with no wait-states, according to Charles River.

Each of the Universe 2600's I/O processors includes its own 12.5MHz MC68000 microprocessor. This allows the I/O processors to handle interrupts ordinarily handled by the main processor. Each I/O processor can handle up to 64 ports; they also can be dedicated to tasks such as a high-speed line, SNA port, or multidrop connection.

Available for the Universe 2600, as with the other Charles River systems, is the UniverseNet local area network (LAN) controller and UniverseNet software. UniverseNet allows Universe systems to communicate with systems from other manufacturers using a nonproprietary communications protocol.



Charles River Data Systems' Universe 2600 supports over 100 concurrent users and up to 1GB of disk storage. The system is built around the Motorola MC68000 microprocessor and the VMEbus. The Universe 2600 is designed for industrial automation and transaction processing applications.

Charles River Data Systems

Product Enhancement

The Universe 2600 uses the same operating systems software as the other Charles River systems. This operating system is Charles River's UN/System V operating system, derived from Unix System V, under license from AT&T and with Charles River's Unos realtime operating system kernel. Other available software includes a 20/20 spreadsheet program, R Office integrated office system, C, Fortran 77, RM/Cobol, and Basic II.

While this announcement does not greatly impact Charles River's competition, vendors are being kept aware that CR is adding new families to its Unix-based supermicrocomputer lineup. The Universe 2600 directly competes with Digital Equipment Corporation's MicroVAX II and AT&T's 3B2/300 and 400 supermicrocomputers. □

EQUIPMENT PRICES

		Purchase Price ($)
BASIC SYSTEMS		
Universe 2600	Base configuration includes 1MB of memory, 45MB ¼-inch streaming tape unit, 140MB (115MB formatted) 5¼-inch Winchester disk, and four serial ports.	29,900 ■