

## Unisys 2200/200 Series

### MANAGEMENT SUMMARY

**UPDATE:** *The latest trend in the mainframe industry is a movement towards smaller, more compact computers called "departmental systems." Unisys Corporation has the unique distinction of having two separate computer systems in this category: the single-processor A 1, A 4, and A 6 systems and the 2200/200 systems with from one to four processors. These systems feature mainframe architectures and operate under mainframe operating systems, MCP/AS and OS 1100, respectively. A new release version of the OS 1100, the System Base Release 2 (SBR 2) is now available for the 2200/200 Series to further improve the performance of these systems and provide users with new capabilities.*

The 2200/200 Series are said to offer the performance of a mainframe with the small size and ease of use of a mini-computer. The systems can be used as central computers, as departmental machines, or as special-purpose systems. No special flooring or air-conditioning is required for the basic models.

The 2200/200 models are built around a Very Large Scale Integration (VLSI) 256K-bit CMOS chip technology. They ➤

The Unisys 2200/200 systems are modular mid-range systems that use the instruction set and operating system of the 1100 Series mainframes. Unlike mainframe systems, the 2200/200 systems use a bus architecture. The systems can have up to four central processors housed in one or two desk-sized cabinets.

**MODELS:** 2200/201, 2200/202, 2200/203, and 2200/204.

**CONFIGURATION:** From one to four CPUs, 8M bytes to 48M bytes of main memory, 32K bytes of cache memory per CPU, 2 to 16 integrated disk drives, one to four integrated cartridge tape drives, and 2 to 224 workstations/terminals.

**COMPETITION:** Digital Equipment 8200 and 8300 and IBM 9370, System/38, and 4300 Series.

**PRICE:** Basic purchase prices range from \$138,100 to \$400,490.



*The Unisys 2200/200 Series has from one to four central processors, 32K bytes of cache memory per processor, and a main memory capacity ranging from 8 to 48 megabytes. Up to eight integrated disk drives can be added to the basic 2200/200 cabinet, which occupies only 10.5 square feet of floor space and plugs into a standard 220-volt outlet.*

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➤ use the 1100 Series instruction set, including the Extended Instruction Set, and run the OS 1100 operating system. Four models are available: the uniprocessor 2200/201, the dual-processor 2200/202, the triple-processor 2200/203, and the quadruple-processor 2200/204. The 2200/201 and 2200/202 are housed in the basic system cabinet. Adding the third and fourth processor requires an expansion cabinet. Main memory ranges from 8 megabytes to 48 megabytes, with the basic cabinet holding up to 24 megabytes.

The system cabinets also house the I/O Processor, integrated disk and tape drives, and various adapters and channel interfaces. A wide variety of peripherals and communications devices can be connected to the system.

Unlike most mainframe systems, the 2200/200 systems use a bus architecture. The System Bus (S-Bus) transfers instructions and data among the Instruction Processors (the central processors), the I/O Processors, and main memory. The I/O Processor uses a transfer bus (T-Bus) which can have up to three Small Computer Systems Interface (SCSI) Host Adapters (SHAs) and up to three Byte Peripheral Adapters (BPAs) with interfaces to peripherals and communications devices. The L-Bus Adapter (LBA) also runs off the T-Bus and supports up to eight Workstation Control Units, one Nonimpact Printer Control Unit, up to three Programmable Line Modules, and one Trace Control Unit. Maximums actually vary, depending on the mix of channels used.

With the 2200/200 Series Unisys offers Shield, a personal computer-based software system. The software requires a Shield personal computer and a tape unit. The Shield software is designed for both experienced and inexperienced users, providing easy pull-down menus and on-line help facilities. The Shield software has three distinct capabilities: handling the day-to-day operation of the system; file administration functions such as file backup and recovery and restoring damaged or deleted files; and security and accounting, which includes the assignment of authorized user IDs and charge-back to the appropriate department using the system.

The 2200/200 has replaced the System 11/Mapper 10 system, Unisys' earlier 1100 Series-compatible small system. The 2200/200 now provides the entry into the 1100 family. It uses the same software and much of the same hardware as the 1100/60, 1100/70, and 1100/90 systems. The 2200/200 models were the first of a new integrated family, to be followed early this year with the yet-unannounced 2200/400 systems that will provide a growth path for 1100/70 and 1100/90 users.

### COMPETITIVE POSITION

One of the major competitors for the 2200/200 is IBM's 9370 superminicomputer. Like the 2200/200, the 9370 is a mid-range system that uses a mainframe architecture; in this case, System/370 architecture. The 9370 family includes four uniprocessor models. According to Unisys, the 2200/200 will compete with the high-end 9375 Model 60

### ➤ CHARACTERISTICS

**MANUFACTURER:** Unisys Corporation, P.O. Box 500, Blue Bell, Pennsylvania 19424. Telephone (215) 542-4011. In Canada: Unisys, Inc., 55 City Centre Drive, Mississauga, Ontario LR3 2Z1.

**MODELS:** 2200/201, 2200/202, 2200/203, and 2200/204.

### DATA FORMATS

**BASIC UNIT:** A 36-bit word. In main storage, each word location includes four additional parity bits.

**FIXED-POINT OPERANDS:** One 36-bit single-precision word. Addition and subtraction can also be performed upon 2-word (72 bit) double-precision operands and upon 18-bit half-words and 12-bit third-words; the left-most bit holds the sign in each case. Moreover, partial words of 6, 9, 12, or 18 bits can be transferred into and out of the arithmetic and control registers.

**FLOATING-POINT OPERANDS:** One word, consisting of 27-bit-plus-sign fraction and 8-bit exponent for single precision; or two words, consisting of 60-bit-plus-sign fraction and 11-bit exponent for double precision. The sign is the most significant bit in single precision (bit 35) and double precision (bit 71). Negative floating-point numbers are represented by the one's complement of the entire corresponding positive floating-point number. Single-precision negative exponents are biased by 128, while double-precision negative exponents are biased by 1,024.

**INSTRUCTIONS:** One word, consisting of 6-bit Function Code, 4-bit Partial-Word or Immediate-Operand Designator, 4-bit Control Register Designator, 4-bit Index Register Designator, 1-bit Index Modification Designator, 1-bit Indirect Address Designator, and 16-bit Address Field.

**INTERNAL CODE:** Unisys (Sperry) communications terminals and other I/O units can employ a 6-bit Fielddata code or standard ASCII code. The 2200 processors are not code sensitive and can manipulate data in 6-bit, 9-bit, 12-bit, or 18-bit codes.

### MAIN MEMORY

All main memory is housed in the 2200/200 system cabinet.

**STORAGE TYPE:** Complementary metal oxide semiconductor (CMOS) using 256K-bit chips.

**CAPACITY:** See Table 1.

**CYCLE TIME:** See Table 1.

**CHECKING:** The Main Storage Unit (MSU) contains circuitry for single-bit error detection and correction and double-bit error detection. Multiples of double-bit errors and some odd multiples of double-bit errors are also detected. Memory errors are detected using a 7-bit hamming code generated for all read and write operations.

A parity bit with each half-word is checked whenever storage is referenced for I/O transfers via the two I/O unit interfaces. The MSU also detects single-bit address errors and out-of-bounds addresses.

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TABLE 1. SYSTEM COMPARISON

MODEL	2200/201	2200/202	2200/203	2200/204
<b>SYSTEM CHARACTERISTICS</b>				
Date announced	October 1986	October 1986	October 1986	October 1986
Date first delivered	December 1986	December 1986	October 1987	October 1987
Field upgradable to	2200/202	2200/203	2200/204	Not applicable
Relative performance	60 RPM*	115 RPM*	165 RPM*	210 RPM*
Number of processors	1	2	3	4
Cycle time, nanoseconds	Not specified	Not specified	Not specified	Not specified
Word size, bits	36	36	36	36
Operating systems	1100	1100	1100	1100
<b>MAIN MEMORY</b>				
Type	256K-bit CMOS	256K-bit CMOS	256K-bit CMOS	256K-bit CMOS
Minimum capacity, bytes	8M	8M	8M	8M
Maximum capacity, bytes	12M	24M	48M	48M
Increment size, bytes	2M	2M	2M	2M
Cycle time, nanoseconds	431	431	431	431
<b>BUFFER STORAGE</b>				
Minimum capacity	32KB	32KB per CPU	32KB per CPU	32KB per CPU
Maximum capacity	32KB	32KB per CPU	32KB per CPU	32KB per CPU
Increment size	None	None	None	None
<b>INPUT/OUTPUT CONTROL</b>				
Number of channels:				
Byte	Up to 3	Up to 3	Up to 6	Up to 6
Block multiplexer	Up to 4	Up to 4	Up to 8	Up to 8
Word	0	0	0	0
Other	Up to 5 DCC IIs	Up to 5 DCC IIs	Up to 10 DCC IIs	Up to 10 DCC IIs

\*Relative Performance Measurement (RPM), 50 RPM equal 1 MIPS.

▷ and 9377 Model 90. Main memory on the larger 9370 models ranges from 8 to 16 megabytes, compared to the 2200/200's 8 to 48 megabytes. The 9370 is a rack-mounted, bus-oriented system that supports a wide variety of peripherals. Unlike the 2200/200, however, the 9370 includes no integrated peripherals or control units in the basic system. A 2200/201 system with 8 megabytes of main memory, 32K bytes of cache memory, two integrated hard disk drives, two display terminals, one I/O Processor, and the integrated controllers/adapters sells for \$138,100. The IBM 9375 Model 60 with 8 megabytes of main memory and a processor console costs \$93,000, while a top-of-the-line 9377 Model 90 with 8 megabytes of main memory and a processor console costs \$190,000. Other system components cost extra.

The 2200/200 systems also compete with the Digital Equipment Corporation 8250 and 8350 systems. The Digital 8250 and 8350 are single-processor commercial computer systems. The 8250 has 16 megabytes of main memory and a performance rating of approximately 1.2 Million Instructions per Second (MIPS) and is priced at \$72,450. The 8350 with 32 megabytes of main memory is rated at approximately 2.2 to 2.3 MIPS and has a price tag of \$98,700.

#### ADVANTAGES AND RESTRICTIONS

Because the 2200/200 systems use the 1100 Operating System, they are completely compatible with most 1100 Series software. The new systems thus provide a growth path for users who want to start with a system smaller than the 1100/70.

▶ **RESERVED STORAGE:** Not specified by the vendor.

#### CENTRAL PROCESSORS

All 2200/200 Series systems are based on the same Instruction Processor (IP) that performs all logical, arithmetic, and instruction sequencing operations. Each IP contains a 32K-byte cache memory.

The 2200/200 Series processors use a 256K-bit chip set, which incorporates 1100 Series architecture. Six chips make up the basic 2200/200 Instruction Processor: the Arithmetic Logic Unit chip, which supports all arithmetic and logic functions; the Address Generator Unit chip, which performs basic and extended addressing; the Decode/Control chip, which performs the first level of decoding on instructions and sends the starting microcode address to the other chips; the Cache Interface chip, which supports the system's cache memory; the Extended Instruction Set chip, which provides extensions to the basic 1100 Series instruction set; and the optional Multiply/Divide chip, which provides hardware acceleration for multiply and divide instructions.

At the heart of the 2200/200 Series systems is the System Bus (S-Bus), which transfers instructions and data among system components at 29.6 megabytes per second. In addition to connecting the Instruction Processor, I/O Processor, and Main Storage Unit, the S-Bus has six expansion slots for attaching I/O channels.

**SPECIAL FEATURES:** The 2200/200 Series Instruction Processor provides a duplicate, mirror processor that checks each operation in parallel with the basic processor to ensure integrity and accuracy.

**PHYSICAL SPECIFICATIONS:** The basic 2200/200 system cabinet measures 50 inches in width, 38 inches in height, and 30 inches in depth. The cabinet weighs 420 pounds. The 2200 operates at 50 or 60 hertz and has a heat ▶

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▷ The 2200/200 systems also use many 1100 Series peripherals, including the Uniservo 22, 24, 26, 28, and 36 II Magnetic Tape Subsystems, the 0776 and 0770 II Line Printers, and the 8652-99 Optical Disk Unit. Thus, if users want to trade up to a larger 1100 Series system in the future, they will not have to replace all of their peripheral equipment.

Because of its modular design, the 2200/200 offers a great deal of configuration flexibility. The various buses, channels, and interfaces enable users to add peripheral devices as needed and to choose the most practical or economical method of connecting them to the system.

Communications options provide further flexibility. Each integrated Workstation Control Unit permits the direct connection of up to 16 terminals. The Programmable Line Module is an integrated communications processor capable of supporting a number of communications protocols. For larger installations, the Distributed Communications Processors (DCPs) can be connected to the 2200/200 to off-load communications processing from the central processors. In a distributed network, the 2200/200 system can serve as either the host or as a departmental machine communicating with another 2200/200, with an 1100 Series host, or with an IBM host.

### USER REACTION

The first customer shipments of the 2200/200 did not take place until December 1986, therefore no user ratings were available when Datapro conducted its 1987 Computer User Survey.

Datapro contacted a value-added reseller (VAR) of Unisys hardware systems in Sugarland, Texas. The company specializes in customized systems for utility companies worldwide. The company takes the 2200/200 system and adds software and hardware to create a turnkey system for use in power plants for a wide variety of energy management applications. The company selected the 2200/200 for its price/performance, small footprint, and compatible operating system. The company has used Unisys systems for several years and plans to use the new 2200/400 system when it becomes available. The company is also very satisfied with the support it receives from Unisys, a very important consideration for any user but more so for a VAR. □

▶ dissipation rate of 7,200 Btu. The basic system cabinet does not require special flooring, electrical connections, or cooling.

### CONFIGURATION RULES

The basic 2200/201 system includes one Instruction Processor (IP) with 32K bytes of cache memory. The basic system cabinet also contains one Main Storage Unit (MSU), the System Bus (S-Bus), the Input/Output Processor (IOP), two integrated 1740-megabyte hard disk drives, and a Workstation Control Unit (WCU). Two SVT-1121 display terminals are also included in the basic configuration.

The MSU includes 2M words (8 megabytes) of main memory, expandable to 3M words (12 megabytes). Two MSUs with a total of 24 megabytes of memory may be housed in the basic cabinet.

Up to eight integrated 170-megabyte or 380-megabyte disk drives can be housed in the basic system cabinet. One tape subsystem is required. An integrated F4071 Cartridge Tape Subsystem, a Uniservo 18 Streaming Tape Subsystem, or Uniservo 22 or 24 Tape Subsystem can be used to meet that requirement. Two cartridge tape units fit into the basic cabinet. In addition, up to seven WCUs, each supporting 16 terminals/workstations, can be housed in the basic cabinet.

The 2200 Series system can be expanded by adding additional components to the basic cabinet, by adding an expansion cabinet, and by adding external peripherals. The 2200/201 can be upgraded to a 2200/202 dual-processor system by installing a second Instruction Processor in the basic cabinet. Further expansion to a triple-processor 2200/203 or quadruple-processor 2200/204 requires an expansion cabinet. In addition to the third or fourth IP, the expansion cabinet can house an IOP, two MSUs, eight integrated disk drives, and two cartridge tape drives. Thus, a maximum 2200/204 system includes four IPs, 48 megabytes of memory, two IOPs, 16 integrated disk drives, and four cartridge tape units.

External disk drives, tape drives, printers, and communications processors can be added through the various adapters and channels available for the 2200/200 Series systems.

### INPUT/OUTPUT CONTROL

The integrated I/O Processor occupies one slot on the System Bus. The IOP uses a transfer bus (T-Bus) with five slots for the interfaces that connect peripherals and communications devices to the 2200 Series system. In the basic system cabinet, one slot must contain a Small Computer System Interface (SCSI) Host Adapter (SHA), and one slot must contain an L-Bus Adapter (LBA).

The integrated disk and tape units connect to the system through the SHA, which supports six peripheral devices. Up to three SHAs can be housed in each 2200 Series cabinet.

The L-Bus supports the Workstation Control Units, the Nonimpact Printer Control Unit (NIPCU), and communications lines. The NIPCU provides the interface for the Model 47 Laser Printer. One L-Bus can be housed in each 2200 Series cabinet.

The Byte Peripheral Adapter (BPA) provides the interface for the Uniservo 18 Streaming Tape Subsystem, Uniservo 22 and 24 Tape Subsystems with integrated controllers, the 0789 Line Printer, and the DCP/10A and DCP/15 communications processors. The BPA has four drops and occupies one slot on the T-Bus.

Two additional types of I/O channels are also available. The Disk Controller Channel II (DCC II) supports up to eight external Model 8451 Disk Subsystems. The 8451 drives each provide 400 megabytes of formatted storage. The DCC II occupies one slot on the S-Bus. Five DCC IIs can be housed in each 2200 system cabinet. The Block Multiplexer Channel (BMC) supports up to eight peripheral devices, including the Uniservo 26 and 28 Tape Subsystems, the 0716 Card Reader, the 0776 Line Printer, the Hyperchannel, the DCP/20 and DCP/40 communications processors, and the Interprocessor Channel Coupler. The ▶

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► BMC occupies one slot on the S-Bus; four BMCs can be housed in one system cabinet. The DCC II and BMC are mutually exclusive.

### MASS STORAGE

For disk drives supported on the 2200/200 Series, please refer to Table 2.

### INPUT/OUTPUT UNITS

Magnetic tape subsystems and printers for the 2200/200 Series are listed in Table 3.

### TERMINALS

Workstations for the 2200/200 Series are described in Table 4.

### COMMUNICATIONS

The integrated *Workstation Control Unit (WCU)* provides for the attachment of up to 16 SVT-1121, PC/microIT, or older UTS 20L workstations to a single 250K bit-per-second (bps) coaxial cable directly connected to the system. The WCU connects to an L-Bus Adapter (LBA), which has eight ports and occupies one slot on the T-Bus of the I/O Processor. Up to seven WCUs can be housed in the basic 2200/200 Series cabinet. The WCU can be used to off-load the Distributed Communications Processor (DCP) in a communications network.

The *Programmable Line Module (PLM)* is a single-board communications processor that can be integrated into the basic cabinet of a 2200 Series system and connected to the LBA. The PLM provides 1 megabyte of storage, a host interface, and two RS-232-C interfaces. Line speeds of 19.2K bps are supported. Each 2200/200 system cabinet can house three PLMs or one PLM with an expansion line module that supports a specific communications protocol. Available protocols include Sperry Uniscope, UNIX, packet switched public data network, X.21, X.25, NTR, and IBM RJE, 3270, and SNA. The PLM supports up to six communication lines per 2200/200 system cabinet.

The *Central Support Interface Line Module (CSI LM)* provides connection through a modem to a Unisys computer located in the Unisys Support Center. The CSI LM provides remote diagnostics and transfer of diagnostic information and data files.

Also available are the *Hyperchannel* and *Interprocessor Channel Coupler (IPCC)*, two freestanding units that link multiple 2200/200 Series systems to each other and to Unisys 1100 Series systems via a high-speed channel.

*DCP/Telcon* is an intelligent communications system that provides basic hardware, software, and peripherals for users with large communications networks. The system can operate as a front-end processor for 2200/200 Series and 1100 Series host processors, as a network nodal processor, or as a remote concentrator. As such, it provides networks that support realtime, time-sharing, remote job entry, and message-switching applications. The major components of Telcon are the Distributed Communications Processor (DCP) and the Telcon network software. Multiple DCPs can be combined to form a node of high throughput and processing capability.

Three DCP models are available: DCP/15, DCP/20, and DCP/40. The DCP/15 includes a processor, from 2 to 4 megabytes of memory, an integrated diskette, an integrated

hard disk, and communications line modules. It supports up to 52 full-duplex communications lines and connects to the 2200 Series via the Byte Peripheral Adapter.

The DCP/20 system consists of a processor with 512K to 2048K bytes of memory, one to three I/O Processors, and communications line modules. The main processor performs both generalized communications processing and input/output processing; the I/O Processors perform input/output processing only. The DCP/20 connects to a 2200 Series system via a Block Multiplexer Channel.

Each DCP/20 I/O Processor provides programmed control for up to 16 data paths, which can be a combination of serial lines to remote equipment, channels to peripheral devices, or channels to on-site host 2200 Series, 1100 Series, or 90 Series processors. Each operational port on the I/O Processors requires one line module, which provides an interface to a line and performs various communications functions such as control character recognition and line timing. The DCP/20 accommodates asynchronous, synchronous, and wideband transmission at up to 64K bps. It supports Universal Data Link Control (UDLC) as well as character-oriented communications protocols.

The DCP/40 system also connects to a 2200 Series system via a Block Multiplexer Channel. The DCP/40 includes a processor with 512K to 4096K bytes of memory, expandable in 512K-byte increments. A maximum DCP/40 may include up to 16 I/O processors, each of which provides program control for up to 16 communications channels. Each can handle a mixture of remote lines, parallel interfaces, and host channel connections. Each I/O Processor is programmed separately using a set of more than 60 macro instructions, and each handles, in addition to data transmission and receipt, remote terminal polling, error checking and recovery, dynamic buffer allocation, reporting of line status, and recording of error and traffic statistics. The DCP/40 supports up to 1,016 full-duplex communications lines.

The DCPs are modular hardware systems that can be tailored to meet the needs of a broad range of users. The network software, Telcon, like the hardware, is also modularly structured and readily tailored by the user. A repertoire of more than 285 instructions is available to the user for the generation, assembly, and loading of message-handling routines.

Software and firmware terminal handlers in the DCPs are available for most standard Unisys (Sperry) terminal devices, as well as for devices from other vendors, including Teletype and IBM 3270 and 2780/3780 batch terminals. Other software modules handle particular line protocols, such as the UDLC trunk lines, or access links to/from X.25 packet-switching services.

Peripherals available for the DCPs include hard disk subsystems, diskette subsystems, magnetic tape subsystems, and printers. The DCPs require an operator console, which can be a UTS 20 terminal, an SVT-1121 terminal, or a UTS 400 terminal attached to a communications line.

### SOFTWARE

**OPERATING SYSTEM:** The new release version of the *OS 1100* Operating System, designated as System Base Release 2 (SBR 2) is available for the 2200/200 systems. The OS 1100 operating system supports batch, transaction, realtime, and interactive processing in multiprogramming, multiprocessing, and distributed processing ►

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TABLE 2. MASS STORAGE

MODEL	4113-01	4113-02	8451
Cabinets per subsystem	—	—	4
Disk packs/HDAs per cabinet	8	8	2 to 4
Capacity (unformatted)	170MB	380MB	515MB
Tracks/segments per drive unit	—	—	17,064
Average seek time, msec.	25	23	20
Average access time, msec.	33.3	31.3	28.3
Average rotational delay, msec.	8.3	8.3	8.3
Data transfer rate	1.25M bytes/sec.	1.25 bytes/sec.	1.15 bytes/sec.
Controller model	Integrated	Integrated	Integrated
Comments	A 5 ¼-inch Winchester disk drive housed in the system cabinet	A 5 ¼-inch Winchester disk drive housed in the system cabinet	A freestanding fixed-disk subsystem

A dash (—) indicates that the information was not supplied by the vendor.

► environments. Batch processing jobs can be submitted either locally or remotely. A scheduling routine selects the runs to be initiated in accordance with user-assigned priorities and deadlines.

The demand processing facilities of the OS 1100 operating system permit interactive use of the system by multiple users at remote terminals. By means of the Executive Control Language, demand-mode users can compile and execute programs, use library facilities, and communicate with the computer center and with other terminals.

Realtime and communications programs, which are subject to specific time constraints, receive top-priority handling by the OS 1100 operating system. Realtime programs receive privileged access to system resources, such as central processors, memory, and input/output channels, and have a priority higher than any other processing except for Executive interrupt processing. Interrupt processing routines can be defined for each realtime communications line; they execute at a higher priority than all other processing.

Multiprocessing is handled as a logical extension of the OS 1100 Executive's multiprogramming capabilities. The system maintains a list of processor activities currently waiting to be performed. Each processor inspects this list, selects a task, and executes it. One processor can interlock the others while referencing critical areas of common data, and various other techniques are employed to guard against interprocessor interference. SBR 2 provides general support for the 5056/8481 cache disk system and support of three- and four-processor versions of the 2200/200 Series. SBR 2 will also support SNA program-to-program communications allowing 2200/200 systems to communicate on a peer-to-peer basis with application on IBM systems using SNA LU6.2 Advanced Program-to-Program Communication (APPC) protocol. Additionally, SBR 2 will support the SHIELD PC Console user-oriented software and the New Programming Environment (NPE), a third-generation language (3GL) application construction that allows the utilization of advanced language compilers.

Standard system software for the 2200/200 Series comes in a pregenerated form called the *General Purpose Typical Executive (GPTE)*. GPTE is ready to use and requires minimal site tailoring. For sites requiring more tailoring, Mixed Mode Executive, a symbolic form of the standard software, is available. The Mixed Mode Executive permits traditional system generation and maintenance.

GPTE includes the OS 1100 Executive and a number of other programs, including the following: Customer On-Site

Maintenance and Installation System (COMUS), the Symbolic Stream Generator (SSG), the Performance Display System (PDS 1100), the Print Forms Utility (PFU 1100), the SHIELD Interface, the Site Administration Package (SIMAN), the Post-Mortem Dump Processor (PMD), the Element Processor (ELT), the Procedure Definition Processor (PDP), the File and Program Utility Processor (FURPUR), the Meta-Assembler (MASM), the Communications Management System 1100 (CMS 1100), the File Administration System (FAS), the Integrated Recovery Utility (IRU), the Transaction Interface Package (TIP), and the Display Processing System (DPS).

COMUS facilitates the installation and maintenance of the Executive software and program products. COMUS provides a high-level interface that directs an automatic system generation process. COMUS also supports an interface for installing all software into the system libraries. Augmenting COMUS is the Symbolic Stream Generator (SSG). Directions and models for building the desired stream images are conveyed to SSG through a skeleton program. The resulting symbolic output streams can be placed in a user-specified file, printed, and dynamically added for execution after SSG terminates. SSG also helps to maintain symbolic input files that may be printed, corrected, and updated for later use.

PDS 1100 analyzes system log files and produces a variety of system operation graphics for the system administrator.

PFU 1100 provides forms generation in support of the Model 47 laser printer.

SHIELD is a PC-based interface for the system operator console providing the operator with assistance in the form of pull-down menus and context-sensitive help screens. SHIELD also supplies audible alarms for a casual mode of operation.

SIMAN provides a single interface for the site administrator to define users' quota limits, Terminal Security System (TSS) data, and system security data. TSS permits each installation to establish a file of valid remote system users through user identification codes, passwords, and other pertinent information. SIMAN allows installation passwords to be changed dynamically and enables users to be selected as masters or submasters to allow delegation of authority in creating and updating identifications and passwords in the TSS file. Each installation can define the action to be taken in the event of an attempted security violation. SIMAN is also a security control processor that is used to create and maintain a user security profile data base, which is then used to control user access to files and certain privileged functions. ►

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TABLE 3. INPUT/OUTPUT UNITS

Magnetic Tape Units	Number of Tracks	Recording Density, Bits/Inch	Encoding	Tape Speed, Inches/Sec.	Transfer Rate, Bytes/Sec.
4071 Cartridge Tape	18	8000	QIC 24	90	90,000
Uniservo 18 Streaming Tape	9	1600	PE	25	40,000
	9	1600	PE	100	160,000
Uniservo 22	9	800	NRZI	75	60,000
	9	1600	PE	75	120,000
Uniservo 24	9	800	NRZI	125	100,000
	9	1600	PE	125	200,000
Uniservo 26	9	1600	PE	75	120,000
	9	6250	GCR	75	470,000
Uniservo 28	9	1600	PE	125	200,000
	9	6250	GCR	125	780,000
Uniservo 36 II	9	1600	PE	200	320,000
	9	6250	GCR	200	1,250,000
Printers	Printing Speed	Print Positions	Horizontal Spacing, Chars./Inch	Vertical Spacing, Lines/Inch	Form Size, Inches
Model 47	19 ppm	105, 127, or 159	10, 12, or 15	—	8.5 to 14 wide
0789-20	300 or 640 lpm	132	10	6 or 8	Up to 15 wide
0776-00	760 lpm	136	10	6 or 8	4.0 to 18.75 wide, 24 long
0776-02	900 lpm	136	10	6 or 8	Same
0776-04	1200 lpm	136	10	6 or 8	Same
0770-II	2000 lpm	136	10	6 or 8	Up to 20 wide

A dash (—) indicates that the information was not supplied by the vendor.

► **PMD** is a user debugging aid that produces edited dumps of the contents of main storage if the program terminates abnormally. Optionally, a dump can be produced when a program terminates normally.

**ELT** is used to insert symbolic, relocatable, absolute, or omnibus elements into a program file from images in the runstream.

**PDP** processes symbolic elements that may contain Assembler, Fortran, or Cobol procedures and produces entries in the table of contents of a program file.

**FURPUR** consists of a set of file maintenance routines that provide for the management and manipulation of cataloged or temporary files containing data or programs.

**MASM** is described under the Programming Languages section of this report. **FAS** and **IRU** are described under Data Management; **CMS 1100**, under Data Communications. A description of **DPS** and **TIP** can be found in the Other Software section.

**PROGRAMMING LANGUAGES:** The 2200/200 Series supports Cobol, Pascal, Fortran, and RPG II. Also available are the Macro general-purpose processor, which extends host languages through its capability to process character strings; the Meta-Assembler (**MASM**), which is

tailored to be particularly efficient for the 1100 Series instruction set; and **CDP 1100**, a C language development system which interfaces with **OS 1100** transaction processing (**TIP**), providing **OS 1100** transaction processing facilities. **CDP 1100** also works in conjunction with **SX 1100** to allow programs to be developed in **UNIX (SX 1100)** and executed under **OS 1100 (TIP)**.

**DATA BASE MANAGEMENT:** The *Universal Data System (UDS) 1100* is designed to provide 1100 Series users with a single unified data subsystem that furnishes the data management services for all components of the 1100 Operating System. **UDS 1100** components include the **UDS 1100 Control**, **Data Management System (DMS) 1100**, **Processor Common Input/Output System (PCIOS)**, **Relational Data Management System (RDMS) 1100**, **Data Dictionary System (DDS) 1100**, **Define File Processor (DFP)**, **Integrated Recovery Utility (IRU)**, **File Administration System (FAS)**, and **Shared File System (SFS)**.

The **UDS 1100 Control** is the on-line data manager of **UDS**, which provides a complete range of data structures, utility programs, and support programs. **UDS 1100 Control** integrates these different programs and manages the movement of data between data models. It also centralizes functions such as audit trails and administration.

**DMS 1100** is a comprehensive data base management system developed under the guiding principles of the ►

## Unisys 2200/200 Series

► **CODASYL Data Base Task Group.** It is designed to satisfy the need for standardized data management techniques that provide the following capabilities: separation of the data definition and data manipulation functions, an acceptable degree of data independence, data base protection and integrity, and alternate data access methods. DMS has four principal components: a Data Description Language, a Data Manipulation Language, a Data Management Routine, and a Data Recognition Utility.

The Data Description Language is a standalone language whose record descriptions are compatible with those of Cobol. The Data Manipulation Language consists of commands embedded in Cobol and Fortran to allow these host languages to manipulate the data base via DMS 1100. The Data Management Routine, the key operational component of DMS 1100, maintains the data base and preserves its integrity. The Data Recognition Utility provides for optimization of the physical placement of records within an existing data base without the need for tailored unload and reload programs.

QLP 1100 is an English-language inquiry system that allows inquiries to be made to data bases generated under DMS 1100. QLP 1100 has the capability to access standard data files and incorporates extended reporting capabilities. It uses a command language designed around a simplified English syntax and requires a minimum knowledge of the DMS 1100 data base structure. QLP can operate either in demand or batch mode, although the primary mode is interactive. Its two major component modules, the Scan Parser, which analyzes incoming commands, and the Task Translator, which accesses the data base, are both reentrant. Through the use of the QLP command languages, users can inquire into the data base, update records, add new records, or delete records. QLP 1100 uses a Subschema Data Definition Language (QLPSDDL) similar to the DMS 1100 DDL. Access to the data base via QLP is regulated by the Data Base Administrator through use of SDDL. QLP also provides a report writer and procedural facilities.

DMS 1100 is described in more detail in Report SW25-944YT-101 in Volume 3 of *Datapro 70*.

PCIOS is designed to ensure compatible data file formats. It supports sequential, indexed sequential, and multikeyed sequential access methods for ASCII Cobol, ASCII Fortran, RPG, Sort, and QLP.

RDMS 1100 provides definition and access for both host language programming and end-user interface software. Relational data bases are defined by the data manipulation language used for retrieval and updating of data. The Relational Transformation Language provides relational views of other data bases, such as DMS 1100. Also available is the Relational Syntax Analyzer (RSA), which permits ASCII Cobol and ASCII Fortran users to access RDMS under UDS.

DDS 1100 provides a means for the centralized description, location, and control of the various elements within a user data base environment. DDS 1100 consists of a data base of information, called the meta-data base, about the entities in the user data base environment, as well as a set of processors that access the meta-data base for the purpose of creating, updating, and reporting information.

DFP provides a data file description external to the program processing the file. Using DFP, programs written in Fortran, Cobol, and RPG are file format independent and can share common files.

IRU provides the user with English-language commands to initiate a variety of integrity features and capabilities. IRU can be used to compare complete or partial records between files.

FAS provides administrative control over policies for file operations, file maintenance, and file recovery. FAS includes capabilities for mass storage file backup, archiving, and reporting. It also provides for the administration of hierarchical files and directories.

UDS SFS is a collection of file access routines that support file handling for Unisys-developed language processors. Files written by an application developed in one programming language can be read and updated by applications developed in another programming language. Files can be concurrently accessed by more than one user. SFS contains a logical data manager, a storage record manager, and data banks. A Data Dictionary System command is used to designate a file as shared.

**DATA MANAGEMENT:** The *Information Management System (IMS) 1100* is an interactive transaction processing system compatible with the IMS used on the Unisys Series 80 and Series 90 computers. It provides defined record management and access to both data and conventional files. IMS 1100 interfaces with DMS 1100 data bases.

**DATA COMMUNICATIONS:** The 2200/200 Series systems support the following data communications packages: the Communications Management System (CMS) 1100, the Programmable Line Module (PLM) 1100, the Processor Common Communication System (PCCS) 1100, the Remote Batch File Transfer/Extended (RBFTE), On-Line Disk/1100, and On-Line Transfer/1100, as well as the Distributed Communications Architecture (DCA).

The *Communications Management System 1100* is the communications network interface for all 2200 Series processors to a DCA-based DCP/Telcon network. It has been separated from the 2200 system generation process, thus allowing the entire terminal network configuration to be generated, checked, and corrected without generating a full system. CMS has cognizance of all terminals in the network and handles polling, parity checking, data blocking, data packing and unpacking, message envelope formatting, message acknowledgment, message queueing, and other message control procedures. The message queue can be maintained in main and/or auxiliary storage. A Protocol function determines what the current activity on each circuit should be in terms of overall system loading, availability of facilities, user-specified priorities, type of circuit or device, and activity response level from the terminal.

CMS handles the standard Unisys (Sperry) terminals, as well as "alien" terminal devices. For alien devices the user must supply a skeletal communications control routine that interfaces into the device-control master service routine of CMS.

The *Programmable Line Module 1100* software supports the PLM communications processor integrated into the 2200 Series systems. PLM 1100 operates within the PLM hardware to provide for the attachment of terminals and other host systems. It supports front-end processors in a DCA environment.

PLM 1100 includes the following modules: PLM-UTS, which supports Sperry UTS terminals; PLM-BSC 3270, which emulates IBM 3270 terminals; PLM-DDP, which provides interconnection to DCP/Telcon networks, host-to-host 2200 connection, and DDP 1100 interconnections; PLM-RJE, which provides for data interchange between a ►



## Unisys 2200/200 Series

TABLE 4. TERMINALS

MODEL	PC/microT	SVT-1121
<b>DISPLAY PARAMETERS</b>		
Max. chars./screen	1,920	1,920 or 3,168
Screen size (lines x chars.)	24 x 80	24 x 80 or 24 x 132
Symbol formation	7 x 7 or 7 x 9 dot matrix	7 x 9 or 5 x 7 dot matrix
Character phosphor	Green monochrome or color	P31 green
Total colors/no. simult. displayed	Palette of 64; 16 displayable	Not applicable
<b>KEYBOARD PARAMETERS</b>		
Style	Varies	Typewriter
Character/code set	84 key standard	94 key
Detachable	Yes	Yes
Program function keys	10 standard	22 standard
<b>OTHER FEATURES</b>		
Buffer capacity	4KB or 16KB	None
Tilt/swivel	—	Standard
Graphics capability	Graphics monitors available	None
<b>TERMINAL INTERFACE</b>	RS-232	Unisys coaxial cable, using UDLC protocol; RS-232 printer port

A dash (—) indicates that the information was not supplied by the vendor.

➤ 2200/200 and an IBM host; PLM-SX1100, which supports UNIX environments; PLM-X25 and PLM-X21, which connect a UTS 4000 terminal to the X.25 or X.21 Public Data Network; PLM-SNA, which provides IBM SNA support; PLM-OIS, which supports office terminals; PLM-NTR, which supports batch terminals that emulate NTR protocol; and PLM-TP, which supports twisted pair communications methods.

Using COMUS, a PLM 1100 configuration is tailored to match the site hardware. Then the executable software and the configuration tables are loaded into the 2200/200 host, and the communications lines are initialized. PLM 1100 interfaces with CMS 1100.

The *Processor Common Communication System 1100* provides a means by which application programs developed in high-level languages such as Cobol can utilize the 2200/200 Series communications system. Programs using PCCS 1100 can communicate with other communication programs, terminal users, remote batch systems, and certain host computers.

The *Remote Batch File Transfer/Extended* enables the transfer of files between 2200/200 systems and IBM host systems connected by a bisynchronous communications 2780/3780 line. RBFTE permits file transfers to be initiated from either the Unisys or IBM host. The 2200/200 system must include PLM/RJE software or a DCP/20 or DCP/40 communications processor.

*On-Line Disk/1100* permits a 2200/200 or 1100 Series host-cataloged file to be used as a Unisys personal computer hard disk to provide a virtual disk capability for the PC user. Thus, the mainframe can access data on the PC, and the PC can access data on the mainframe. A companion product, *On-Line Disk/PC*, must be installed in the personal computer.

*On-Line Transfer/1100* allows for the transfer of ASCII files between a 2200/200 or 1100 Series mainframe and a Unisys personal computer. The package supports both synchronous and asynchronous environments.

The *Distributed Communications Architecture* describes the currently available communications hardware and software components through which networking of Unisys processors and terminal devices is achieved.

Whether network control is host dependent or independent, there are still certain hardware components and subsystems required to implement a DCA network. Inherently, a DCA node or host must contain several software components that provide it with the network interface.

The capability of completely separating communications management from applications processing is a key characteristic of DCA. The off-loading of communications processing permits the host or hosts to concentrate their energies on applications processing, their primary function. Another characteristic of DCA is its ready acceptance of other vendors' terminals, processors, and networks.

An extensive library of modular network management applications is available. User programming for tailored communications functions (such as message switching) is also fully supported.

A minimal DCA network requires a DCA host with a communications subsystem. A DCA terminal is generally one for which a standard terminal-handling module is available. In DCA, each terminal might be operating with different character codes (ASCII, EBCDIC), transmission modes (start/stop asynchronous, character synchronous), or terminal protocols (U100, IBM 2780). It is the responsibility of the Distributed Communications Processor closest to the terminal to translate its data format into a common trunk language—typically UDLC.

UDLC is a bit-oriented, synchronous protocol designed for full-duplex operation. Devices connected by UDLC trunks can utilize either switched or nonswitched, voice grade, or digital lines. UDLC, like its SDLC, HDLC, and ADCCP predecessors, uses bit sequences rather than whole characters for control codes. (Hence the nomenclature "bit oriented.") This characteristic permits much more control information to be contained in the same or a smaller amount of message space.

**PROGRAM DEVELOPMENT:** *Mapper 1100* is a real-time report processing system for multiple terminal systems. Data is collected and updated via the CRT display units in free-form or prescribed report formats. Functions such as record and page display, update, search, sort, and report generation can be developed into saved programs for on-line application development. A forms generation capability allows implementation of data bases and related report processing and generating services without applications programming. ➤

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► *CTS 1100* is a modular software system that provides users at remote terminals with a human-machine interface. The system consists of the CTS Control module; interactive syntax analyzers for Basic, Fortran, and Cobol; and access to the compilers for Cobol and Fortran. CTS provides the user with a simplified command language editor. Although still available, CTS has effectively been superseded by the newer Interactive Processing Facility.

The *Interactive Processing Facility* supports both batch and time-sharing operations. It provides a user interface to the system through a procedural command language and an English-language response language. IPF 1100 is designed for ease of use by users with little or no data processing background, as well as by computer professionals. Functional capabilities can be expanded by adding user-developed program modules or by modifying or adding commands. IPF 1100 includes data management capabilities, security features, and session control capabilities.

IPF consists of a number of separately priced modules. IPF Control provides the framework for the installation and use of the other modules. The IPF Command Language is the primary interface for using IPF. It is based on CODASYL specifications. The development of command language sub-routines and macros is accomplished through the IPF Procedures module. The Distributed Data Processing module supports file transfers and job submissions between 2200 Series systems. The Edit 1100 module is an input and update editor that provides access to a variety of file formats, works in an easy-to-use full-screen mode, and can be used from a terminal or called from a program. The User Assistance module manages responses to the terminal user, as well as HELP and explanation processing. Finally, the Distributed Information Services module provides document exchange among hosts with different architectures.

*SX 1100* is an application program based on UNIX System V OS 1100 designed to provide a set of software development tools for applications developers as well as for the execution of standard applications. It features debugging tools, on-line documentation, a file management system, access to OS 1100 demand processing, and the capability to access and write OS 1100 formatted files.

The *Programmer's Advanced Debugging System (PADS) 1100* is a language-independent debugging tool. PADS was designed primarily for debugging programs written in high-level languages such as Cobol and Fortran, but it may also be used for programs written in Assembler.

**UTILITIES:** The 2200/200 Series systems support a number of utility packages, including CULL, Sort/Merge, Log Analyzer, Performance Analysis Routines, and the On-line System Activity Monitor.

*CULL* produces an alphabetically sorted, cross-referenced listing of all symbols in a specified set of symbolic elements. Each symbol processed by CULL can contain up to 12 alphanumeric characters plus the dollar sign. An interactive version, IACULL, is also available.

The *Sort/Merge* package provides three sort options and a standard merge option. The sort options are record sort, selection sort, and tag sort. Up to 26 files can be merged, and up to 40 keys can be specified.

The *Log Analyzer (LA)* is designed to assist the user in monitoring the resource utilization of an 1100 Series system. The *Performance Analysis Routines (PAR)* package is a reporting system for data collected by the Software Instrumentation Package embedded in the operating system.

The *On-line System Activity Monitor (OSAM)* provides an on-line, realtime display of system activity. OSAM can be used in conjunction with LA and PAR.

**OTHER SOFTWARE:** The *Transaction Interface Package (TIP)* serves as the "go-between" between the 1100 Operating System and the user's application programs in a transaction-oriented on-line data processing system. TIP's functions are stimulated by the incoming transaction messages stored in the common data pool maintained by CMS. The TIP transaction scanner, Transcan, analyzes each message, determines which application program is required to process it, and arranges for the Executive to load and execute that program. One application program can also call another application program via TIP, through program action based on data parameters. The application programs can be written in Cobol, Fortran, Assembler, or PL/I and can be reentrant. TIP's features include on-line debugging aids, a batch-mode checkout capability, interprogram protection facilities, and comprehensive system recovery provisions. User-written routines can be accommodated by TIP to perform installation-specified functions such as prioritizing messages and other special message manipulation. The integrated recovery feature supports synchronized recovery of the communications messages and data base updates in a transaction processing environment. Once an input message is received, the requested transaction will be executed regardless of any component failure.

The *Display Processing System (DPS) 1100* provides for screen handling and the management of display-oriented transactions in an on-line environment. DPS 1100 includes an interactive screen generator and a screen handler. Additional functions are provided for data editing and validation, applying passwords to screens or separate fields of screens, and controlling access to multipage screens.

*Checkpoint/Restart* snapshots a run or program and creates a checkpoint that may be used for restarting at a later time, if desired.

Application software packages available for the 2200/200 Series include the Interactive Financial Planning System (IFPS); Data Management and Statistical Analysis (P-Stat); Author System for Education and Training (ASET); Municipal Finance System; Automated Library System (PALS); Standardized Tactical On-Line Police System (STOPS); Social Service Programs (SSP); Child Support Enforcement System (CSES); Comprehensive Public Assistance System (CPAS); and the Graphic Image System (TEMPLATE 1100).

### PRICING AND SUPPORT

**POLICY:** The 2200/200 systems are available for purchase or on a one-year or five-year lease. All software is unbundled.

**SUPPORT:** On-site operating system support can be obtained for a flat monthly fee. Support is available for some software at a separate monthly charge.

The standard use and service agreements allow unlimited use of the equipment (exclusive of the time required for remedial and preventive maintenance). There are no extra-use charges. The basic maintenance charge covers maintenance of the equipment for nine consecutive hours a day between the hours of 7 a.m. and 6 p.m., Monday through Friday. Extended periods of maintenance are available at premium rates. ►

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► The Total Remote Assistance Center (TRACE) is a remote hardware maintenance facility located in Roseville, Minnesota. TRACE is available to 2200 Series customers via a dedicated WATS number 24 hours per day and 7 days per week. Via TRACE, a user's system may be monitored and controlled using on-site and remote library testing programs. TRACE also provides support for a wide range of terminals connected to dial-up lines. Various data files in Roseville contain information on approved hardware changes, references to solutions for problems encountered with diagnostic test software in field use, and operating system enhancements and problems. Other files contain a history of how the system should operate properly and can be utilized for comparison purposes during diagnostic testing.

**EDUCATION:** A variety of self-study and lecture courses are offered. Instruction is available for both hardware and software systems.

**TYPICAL CONFIGURATIONS:** The following systems illustrate some of the configurations that are possible within the 2200/200 Series. All necessary hardware and operating system software are included in the indicated prices.

### 2200/201:

Processor Complex with one CPU, MSU with 8MB of main memory, 32KB of cache, IOP, two 170MB integrated disk drives, and two SVT-1121 terminals	\$138,100
Two 4113 Disk Formatters and Drives (340MB)	15,400
Two 4115 Disk Drive Expansions (340MB)	13,200
One 4071 Cartridge Tape Subsystem	4,400
One 0789-20 Printer (640 lpm)	15,650
One Print Band	225
One F4325-01 Programmable Line Module	6,600
One F4077-00 Byte Peripheral Adapter	3,080
One F4079-01 SCSI Host Adapter, 2nd	4,290
One 8987-99 General Purpose Typical Executive	21,332

**TOTAL PURCHASE PRICE:** \$222,277

### 2200/202:

Processor Complex with two CPUs, two MSUs with a total of 16MB of memory,	\$218,290
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32KB of cache per CPU, IOP, two 170MB integrated disk drives, and two SVT-1121 terminals	
Three 4113 Disk Formatters and Drives (510MB)	23,100
Three 4115 Disk Drive Expansions (510MB)	19,800
Two 4071 Cartridge Tape Subsystems	8,800
One 0876-71 Uniservo 22 Tape Subsystem	26,690
Two 0789-20 Printers (640 lpm)	31,300
Two Print Bands	450
One F4325-01 Programmable Line Module	6,600
One F4077-00 Byte Peripheral Adapter	3,080
One F4079-01 SCSI Host Adapter, 2nd	4,290
One 8987-99 General Purpose Typical Executive	21,332

**TOTAL PURCHASE PRICE:** \$363,732

### 2200/204:

Processor Complex with 2 system cabinets, 4 CPUs, 2 MSUs with a total of 16MB of memory, 32KB of cache per CPU, 2 IOPs, two 170MB integrated disk drives, and 2 SVT-1121 terminals	\$400,450
Two F4073-00 Main Storage Units (4MB)	35,420
Fourteen F4076-00 MSU Expansions (28MB, for a system total of 48MB)	141,680
Seven 4113 Disk Formatters and Drives (1.19GB)	53,900
Seven 4115 Disk Drive Expansions (1.19GB)	46,200
One 0876-69 Uniservo 24 Tape Subsystem with controller and one 125-ips drive	28,010
Two 0876-73 Uniservo 24 Tape Drives	41,020
One 0447-95 Laser Printer (19 ppm)	25,262
One Character Font Cartridge	175
One 0789-20 Printer (640 lpm)	15,650
One Print Band	225
Two F4325-01 Programmable Line Modules	13,200
Two SVT-1121 Display Terminals	1,790
One F4077-00 Byte Peripheral Adapter	3,080
One F4079-01 SCSI Host Adapter, 2nd	4,290
One F4079-02 SCSI Host Adapter, 3rd	4,070
One F4079-03 SCSI Host Adapter, 4th	4,510
One F4223-01 Nonimpact Printer Control Unit	3,312
One 8987-98 General Purpose Typical Executive	42,667

**TOTAL PURCHASE PRICE:** \$864,911

## EQUIPMENT PRICES

### Monthly Charges\*

		Purchase (\$)	Monthly Maint. (\$)	1-Year Lease (\$)	5-Year Lease (\$)
<b>PROCESSORS AND FEATURES</b>					
3088-80	2200/201 System; consists of one basic cabinet containing one Instruction Processor, one Main Storage Unit (MSU) with 2M words (8M bytes) of main memory, 32KB of cache memory, one Input/Output Processor (IOP), one L-Bus Adapter, one SCSI Host Adapter (SHA-1) with one disk formatter and two F4113 disk drives, and one Workstation Control Unit (WCU) with two SVT-1121 terminals; requires one tape unit	138,100	665	5,754	3,836
3088-96	2200/202 System; same as 2200/201, but includes two Instruction Processors and two MSUs with a total of 4M words (16M bytes) of main memory	218,290	940	9,095	6,064
3088-95	2200/203 System; same as 3088-96, but includes an expansion cabinet and a third Instruction Processor	327,850	1,335	13,660	9,108

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.

## Unisys 2200/200 Series

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	(\$)	Lease (\$)	Lease (\$)
▶ 3088-94	2200/204 System; same as 3088-95, but includes a fourth Instruction Processor	400,450	1,590	16,685	11,125
3088-92	2200/201 System with SHIELD; consists of one basic cabinet containing one Instruction Processor, one Main Storage Unit (MSU) with 2M words (8M bytes) of main memory, 32KB of cache memory, one Input/Output Processor (IOP), one L-Bus Adapter, one SCSI Host Adapter (SHA-1) with one disk formatter and two F4113 disk drives, and one Workstation Control Unit; requires SHIELD PC console, a dedicated WCU, and one tape unit	136,478	645	5,686	3,791
3088-91	2200/202 System with SHIELD; same as 2200/201 with SHIELD, but includes two Instruction Processors, two MSUs with a total of 4M words (16M bytes) of main memory; requires SHIELD PC console, a dedicated WCU, and one tape unit	216,668	920	9,028	6,019
3088-90	2200/203 System with SHIELD; same as 2200/202 with SHIELD, but includes 3089-00 expansion cabinet and three Instruction Processors; requires SHIELD PC console, a dedicated WCU, and one tape unit	326,228	1,315	13,593	9,062
3088-89	2200/204 System with SHIELD; same as 2200/203 with SHIELD, but includes four Instruction Processors; requires SHIELD PC console, a dedicated WCU, and one tape unit	398,828	1,570	16,618	11,079
3137-76	SHIELD PC Console; requires a dedicated WCU	5,953	53	248	165
3089-00	Expansion Cabinet; can contain two Instruction Processors, two MSUs, one IOP, eight 4113 Disk Subsystems, and two 4071 Cartridge Tape Units	36,960	140	1,540	1,027
F4111-99	Instruction Processor Expansion; maximum of two IPs per cabinet and four per system	72,600	255	3,025	2,017
F4151-99	High-Speed Multiply/Divide	11,000	25	459	305
F4080-99	IOP Expansion; for installation in the 3089-00 Expansion Cabinet	13,200	60	550	367
F4073-00	Main Storage Unit; includes control and 0.5M words (2MB) of memory	17,710	60	738	492
F4076-00	MSU Expansion; 0.5M words (2MB) of memory; maximum of 5 per MSU	10,120	40	422	281
1974-01	Peripheral Cabinet	1,606	8	67	45
F4257-00	Disk Controller Channel (DCC II); supports the attachment of up to eight 8451 Disk Subsystems with up to four disk drives each; maximum of 5 DCC IIs per cabinet and 10 per system	10,863	50	453	302
K3652-01	Block Multiplexer Channel (BMC); mutually exclusive with DCC II; maximum of four per 2200 system cabinet	9,350	65	390	260
F4369-00	BMC Conversion	1,650	7	69	49
F4223-01	Nonimpact Printer Control Unit (NIPCU); required to support the Model 47 Laser Printer	3,312	17	138	92
F4077-00	Byte Peripheral Adapter (BPA); provides for the connection of 0789 Printers, Uniservo 18, 22, and 24 Magnetic Tape Subsystems, and DCP/10A and DCP/15 communications processors	3,080	10	128	86
F4078-00	L-Bus Adapter (LBA); provides for the connection of workstations and Programmable Line Modules	4,400	25	183	122
F4612-00	L-Bus Expansion Module; permits the installation of one WCU or NIPCU on the L-Bus in place of a PLM Expansion Line Module	550	—	23	15
F4079-01	SCSI Host Adapter (SHA-2); provides second SHA for the connection of additional integrated disks and cartridge tape units	4,290	25	179	119
F4079-02	SHA-3; provides third SCSI Host Adapter	4,070	25	170	113
F4079-03	SHA-4; provides fourth SCSI Host Adapter; requires expansion cabinet	4,510	25	188	125
F4079-04	SHA-5; provides fifth SCSI Host Adapter; requires expansion cabinet	4,290	25	179	119
F4079-05	SHA-6; provides sixth SCSI Host Adapter; requires expansion cabinet	4,070	25	170	113
F3955-01	Workstation Control Unit (WCU); provides connections for up to 16 workstations/consoles; one is included in the basic system cabinet; requires IOP Expansion with LBA for installation in the expansion cabinet	2,750	13	115	76
F4270-00	Power Supply Expansion, First	2,640	15	110	73
F4270-01	Power Supply Expansion, Maximum	6,050	30	252	168
F4378-00	Power Supply, +12 V DC	1,210	10	50	34
F4549-00	Dayclock Auxiliary Battery	660	4	28	18
K3728-01	Subsystem Power Control (SPC); provides remote power control	16,000	34	667	444
F3729-00	SPC Interface Expansion; provides additional control unit interfaces	1,600	3	64	48

### MASS STORAGE

F4113-01	Disk Formatter II and 170MB Disk Drive; fits into system cabinet; supports one additional disk drive	7,700	35	321	214
F4115-01	Disk Drive Expansion, 170MB; maximum of 8 disks per system cabinet, 16 per system	6,600	30	275	183
F4113-02	Disk Formatter IV and 380MB Disk Drive; fits into system cabinet; supports one additional disk drive	11,750	42	490	326
F4115-02	Disk Drive Expansion, 380MB; maximum 8 disks per systems cabinet, 16 per system	10,105	36	421	281

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.

## Unisys 2200/200 Series

	Monthly Charges*			
	Purchase (\$)	Monthly Maint. (\$)	1-Year Lease (\$)	5-Year Lease (\$)

▶ 8451-00	8451 Disk Subsystem; includes integrated controller and 400MB disk drive; maximum of 4 drives per Disk Subsystem cabinet and 4 subsystems per 2200 Series system	38,266	171	1,594	1,063
F4329-00	8451 Disk Drive Expansion	12,900	65	538	358
F4332-00	Dual Access Feature	4,850	28	202	135
5071-00	Optical Disk Control; includes freestanding cabinet; connects to block multiplexer; controls up to four optical string controllers in optical disc cabinets	36,000	360	1,500	1,000
F0487-00	Disk Control Expansion; second disk control for 5071-00	25,560	102	1,113	742
F0486-00	Dual Channel for 5071-00 control	3,960	17	165	110
F0486-01	Dual Channel for F0487-00 Control Expansion	3,960	17	165	110
8652-99	Optical Disk Unit; freestanding cabinet with one 2.6GB Optical Disk Drive and room for three additional optical disc units; connects to 5071-00 Optical Disk Control	50,860	210	2,119	1,413
F0488-00	Optical Disk Drive Expansion; provides additional 2.6GB for 8652-99	25,560	106	1,065	710
F0489-00	String Switch for 8652-99 disk unit	4,680	20	195	130
8654-99	Optical Disk Library; freestanding cabinet with one optical library disk drive and space for one additional optical library disk drive; cabinet contains automatic disk changer with a capacity of up to 32 disk cartridges	110,860	390	4,619	3,079
F0488-02	8654-99 Optical Disk Library Drive Expansion	25,560	106	1,065	710
F4761-00	Removable Optical Disk Cartridge, (2.6GB)	460	—	—	—

## MAGNETIC TAPE UNITS

F4071-00	Tape Formatter III and Cartridge Tape Drive; fits into 2200 system cabinet; maximum of two per cabinet	4,400	25	183	122
2014-99	Uniservo 18 Streaming Tape Unit; first drive	8,900	93	271	223
K3782-01	Uniservo 18 Streaming Tape Unit; additional drive; maximum of four drives per BPA	8,600	90	260	215
0876-71	Uniservo 22 Tape Subsystem; includes one U22 tape drive and control for up to three additional U22 or U24 tape drives; maximum of four subsystems per BPA	26,690	160	1,112	741
0876-69	Uniservo 24 Tape Subsystem; includes one U24 tape drive and control for up to three additional U24 or U22 tape drives; maximum of four subsystems per BPA	28,010	183	1,167	778
5055-99	Uniservo 2X Control; provides control for up to eight U22, U24, U26, or U28 tape drives, in any combination	22,700	140	635	470
F2451-00	9-Track NRZI Feature for 5055 Control	3,170	16	82	63
F3737-00	Dual Access Feature for 5055 Control	900	5	27	20
F3738-00	Dual Channel Feature for 5055 Control	1,000	4	34	25
F3739-00	Translation Feature; ASCII to/from EBCDIC	3,600	18	94	72
0876-75	Uniservo 22 Tape Drive; 800/1600 bpi	19,190	114	690	460
0876-73	Uniservo 24 Tape Drive; 800/1600 bpi	20,510	138	737	491
0884-00	Uniservo 26 Tape Drive; 1600/6250 bpi	22,000	187	595	440
0884-02	Uniservo 28 Tape Drive; 1600/6250 bpi	24,750	198	675	500
5042-91	Uniservo 36 II Subsystem; includes control and first two Uniservo 36 II tape drives, 1600/6250 bpi, 320K/1250K bytes transfer rate; attaches to block multiplexer channel	81,690	957	3,404	2,269
F4849-00	Dual Channel Feature for 5042-91 subsystem	4,408	44	187	122
F4847-00	Dual Access for eight drives; requires two 5042-91 subsystems	5,990	25	250	166
F4848-00	Dual Access for 16 drives; requires two 5042-91 subsystems and F4847-00 Dual Access Feature	5,990	25	250	166
F4850-00	Nine-Track Translator; ASCII to/from EBCDIC, one required for each control in a dual access subsystem	1,785	15	74	50
0874-22	Uniservo 36 II Tape Drive; includes cabinet	25,000	279	1,042	694

## PRINTERS AND CARD READERS

0447-93	Model 47 Laser Printer (with fiber optic link); 19 ppm; requires NIPCU on the L-Bus	27,262	239	1,136	757
0447-95	Model 47 Laser Printer (with RS-232 interface); 19 ppm; requires NIPCU on the L-Bus	25,262	227	1,053	702
F4164-XX	Character Font Cartridge	175	—	8	5
F4712-00	Fiber Optic Cable, 100 feet	420	—	—	—
F4712-01	Fiber Optic Cable, 250 feet	690	—	—	—
F4712-02	Fiber Optic Cable, 500 feet	1,140	—	—	—
F4712-03	Fiber Optic Cable, 750 feet	1,590	—	—	—

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.

## Unisys 2200/200 Series

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	(\$)	Lease	Lease
		(\$)	(\$)	(\$)	(\$)
▶ F4712-04	Fiber Optic Cable, 1,000 feet	2,040	—	—	—
F4712-05	Fiber Optic Cable, 2,000 feet	3,840	—	—	—
F8290-03	RS-232 Duplex Cable; PVC-coated, 20 feet	64	—	—	—
F8290-06	RS-232 Duplex Cable; PVC-coated, 50 feet	78	—	—	—
F8291-03	RS-232 Duplex Cable; Teflon-coated, 20 feet	86	—	—	—
F8291-06	RS-232 Duplex Cable; Teflon-coated, 50 feet	132	—	—	—
0770-06	Line Printer and Control; 2000 lpm, 48-character set	48,000	520	2,400	1,800
F2245-00	Expanded Character Set Control; accommodates print cartridges with more than 64 characters	1,910	5	50	40
F4836-XX	Print Band	462	—	—	—
F4837-XX	Print Band				
0776-00	Line Printer and Control; 760 lpm with 48-character set	36,570	284	1,006	803
0776-02	Line Printer and Control; 900 lpm	41,340	340	1,134	907
0776-04	Line Printer and Control; 1200 lpm	48,000	388	1,431	1,145
F2217-00	Speed Upgrade; 0776-00 to 0776-02	4,770	56	128	104
F2245-00	Expanded Character Set Control; required for character sets with more than 64 characters	1,910	5	50	40
F2215-XX	Printer Cartridge	1,270	—	34	26
F2216-XX	Printer Cartridge	1,270	—	34	26
0789-31	Line Printer and Control; 300 lpm, 48-character set	12,500	151	521	347
F3866-00	Remote Power Sequencing; remote power control cable for 0789-31 printer	800	8	21	16
F2865-XX	Initial Print Band	225	—	—	—
F3607-XX	Replacement Print Band	184	—	—	—
0789-20	Line Printer; 640 lpm	13,300	156	417	313
F3321-XX	Initial Print Band	225	—	—	—
F3608-XX	Replacement Print Band	184	—	—	—
0716-89	Card Reader and Control; 80 columns	16,545	186	445	322
F1487-00	Short Card Feature; 51 columns	1,968	17	45	32
F1487-01	Short Card Feature; 66 columns	1,968	17	45	32

### TERMINALS

3612-95	SVT-1121 Console; includes 14-inch screen, keyboard, setup menu in 6 languages, full-duplex auxiliary port, security keylock, and power cord	895	10	—	—
0425-63	Model 25C Impact Matrix Printer; RS-232 interface, 200 cps bidirectional printing; for use with a SVT 1121 workstation as a console printer	1,375	40	60	50
0425-64	Model 25C Impact Matrix Printer; RS-232 interface; for use with a SVT 1121 workstation as a console printer	1,375	40	60	50
0472-99	Bidirectional Printer for SVT-1121; 160 cps in data processing mode, 32 cps in near letter quality mode	695	—	—	—
3137-99	PC/microIT; basic unit with 512KB of memory; does not include keyboard, display, disks, or diskettes	2,345	**281	NA	NA
3137-98	PC/microIT; expanded unit with 512KB of memory and 20MB fixed-disk drive with controller	3,040	**419	NA	NA
3137-93	PC/microIT; configured system with 512KB of memory, 20MB fixed-disk drive with controller, and 1.2MB diskette drive	3,315	**419	NA	NA
3137-92	PC/microIT; basic system with 512KB of memory and 1.2MB diskette drive	2,620	**281	NA	NA
F4208-60	Standard Keyboard	155	**24	NA	NA
3617-00	Monochrome Display Unit	275	**44	NA	NA
F5051-01	Monochrome Display Unit Controller	225	NA	NA	NA
3584-02	Color Graphics Display Unit	680	**125	NA	NA
F4764-00	Color Graphics Display Unit Controller	244	NA	NA	NA

### COMMUNICATIONS

0986-00	Interprocessor Channel Coupler (IPCC); connects two systems via block multiplexer or selector channels	20,000	57	440	375
F3950-00	IPCC Module, Additional	20,000	55	440	375
F4325-01	Programmable Line Module (PLM); provides integrated communications processor, host interface, and RS-232-C or X.21 interface; maximum of three PLMs per 2200 cabinet	6,600	30	275	183
F3165-02	Multiline Asynchronous Line Module; provides full-duplex interface to up to four data sets; conforms to RS-232-C and CCITT V.24 and V.28; up to 2400 bps; requires a PLM	2,880	14	120	80
F3837-01	Multiline Synchronous Line Module; provides full-duplex interface to up to four data sets; conforms to RS-232-C and CCITT V.24 and V.28; requires a PLM	2,880	14	120	80

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.

## Unisys 2200/200 Series

		Monthly Charges*				
		Purchase	Monthly	1-Year	5-Year	
		(\$)	Maint.	Lease	Lease	
			(\$)	(\$)	(\$)	
▶	F3163-05	Medium-Speed Line Module; provides full-duplex interface to a synchronous or asynchronous modem; conforms to RS-232-C and CCITT V.24 and V.28; also operates with Bell DDS up to 9600 bps	1,275	8	53	36
	F3163-06	Medium-Speed Line Module; provides full-duplex interface to switched public data networks; conforms to CCITT X.21; requires a PLM	2,500	14	104	69
	F3842-99	Central Support Interface; provides communications line connection to a Unisys Support Center; includes modem	3,850	15	160	107
	F3842-98	Central Support Interface; for international use; does not include modem	3,080	12	128	86
	1986-75	Distributed Communications Processor/10A (DCP/10A); includes cabinet with space for additional DCP/10A, processor with 512K bytes of storage, power supply, power distribution, cooling, operator panel, active line indicators, microprograms, multiple device line module, and integrated diskette drive with controller; requires F1946-02 or F1947-03 host interface	14,950	165	623	415
	1986-73	DCP/10A; same as 1986-75, except that processor includes 1MB of storage	20,450	238	852	568
	1986-71	DCP/10A; same as 1986-75, except it also includes a 10MB rigid disk drive	17,750	218	740	493
	1986-69	DCP/10A; same as 1986-75, except it includes a processor with 1MB of storage and a 10MB rigid disk drive	23,250	291	939	646
	2005-75	DCP/10A; same as 1986-75, except cabinet is not included	13,716	158	587	386
	2005-73	DCP/10A; same as 2005-75, except processor has 1MB of storage	19,216	231	816	539
	2005-71	DCP/10A; same as 2005-75, except it also includes integrated 10MB rigid disk drive	16,516	211	704	464
	2005-69	DCP/10A; same as 2005-75, except it includes a processor with 1MB of storage and an integrated 10MB rigid disk drive	22,016	284	903	617
	F3891-03	Storage Expansion; expands processor storage from 512KB to 1MB	10,400	70	433	289
	F4427-00	Storage Expansion; expands processor storage from 1MB to 1.5MB or from 1.5MB to 2MB	10,400	70	433	289
	F3895-00	Power Supply Expansion; provides additional power for remote configurations	882	5	26	21
	F1947-03	8-Bit Host Interface	4,000	23	105	85
	1986-67	Data Communications Processor/15 (DCP/15); includes cabinet with processor, 2MB of memory expandable to 4MB, power supply, power distribution, cooling, operation panel, active line indicators, microprograms, multiple device line module, and integrated diskette drive with controller; requires F1946-02 or F1947-03 host interface and SVT-1121 console; provides space for one 2053-XX DCP/15	15,125	50	630	420
	1986-63	DCP/15; same as 1986-67, but also includes 20MB of integrated disk storage	17,125	70	714	476
	1986-65	Expanded DCP/15; includes 4MB of memory	23,320	55	972	648
	1986-61	Expanded DCP/15; includes 4MB of memory and 20MB of integrated disk storage	25,320	75	1,055	703
	2053-99	DCP/15; same as 1986-67, except cabinet is not included	13,915	50	580	387
	2053-97	DCP/15; same as 1986-65, except cabinet is not included	22,110	50	921	614
	2053-95	DCP/15; same as 1986-63, except cabinet is not included	15,915	70	663	442
	2053-93	DCP/15; same as 1986-61, except cabinet is not included	24,110	75	1,005	670
	F3895-01	Power Supply Expansion; provides additional power for remote configurations	970	5	40	27
	8597-78	Data Communications Processor/20 (DCP/20); includes cabinet, processor with 512KB of storage, power supplies, power distribution, cooling, maintenance panel, operator panel, active line indicators, microprograms, and integrated diskette drive	35,000	247	1,458	972
	8597-76	DCP/20; same as 8597-78, except processor includes 1MB of storage	42,110	383	1,755	1,170
	2024-96	Storage Expansion; expands processor storage from 512KB to 1MB	12,250	136	510	340
	8597-01	Expansion Cabinet; contains processor capable of performing I/O functions only; provides mounting for 8 line modules; maximum of 2 per DCP/20 system	24,000	129	656	525
	F2894-00	Line Module Expansion; provides 8 additional line modules for 8597-01	12,000	65	460	250
	8596-96	DCP/40; includes processor with 512KB of main storage, I/O controller module, first I/O processor, and microprograms; requires an integrated diskette plus an 8441-81 disk subsystem, communications line modules, and an SVT-1121 console	84,245	452	2,305	1,843
	K1930-01	Storage Expansion; provides additional 512KB of storage; maximum of 3	15,600	126	410	325
	1945-99	Expansion Cabinet; provides power supply and power controller; accommodates up to 4 I/O processors and up to 4MB of main storage; maximum of 3 per DCP/40 system, only one of which can contain storage	27,060	158	740	593
	F2942-01	Storage Controller; provides a storage controller and 512KB of storage; mounts in expansion cabinet; can be expanded to 2MB by the addition of up to 3 K1930-01 storage expansion features and expanded up to 4MB with the addition of a 2036-99 and 3 K3930-01 features; maximum of one per system	26,880	157	735	588
	2036-99	Storage Controller Expansion; includes 512KB of storage; can be expanded to 2MB with the addition of up to 3 K1930-01 storage expansion features to create the second 2MB of storage in the 1945-99 expansion cabinet	13,950	83	365	290
	F1933-00	I/O Processor Controller Module; provides expansion cabinet with first IOP and space for mounting 3 additional IOPs and a storage port expander	14,680	84	399	320
	F2941-99	Second IOP Expansion; provides second IOP for 8596-96 or 1945-99; includes power for 2 more IOPs	14,920	87	410	326

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\*\*On-call annual maintenance.

NA—Not available.

## Unisys 2200/200 Series

### Monthly Charges\*

		Purchase (\$)	Monthly Maint. (\$)	1-Year Lease (\$)	5-Year Lease (\$)
F1932-99	Third IOP; mounts in 8596-96 or 1945-99; includes storage port expander	14,185	82	389	310
F1932-98	Fourth IOP	10,635	62	294	231
F1928-00	Operator Station; a freestanding work surface that can be used for the local console	1,200	—	30	25
F1825-05	Active Line Indicator; provides a visual display of line activity on up to 16 communications line modules in a single IOP	960	4	26	21
Features for the DCPs:					
F1936-00	DCP/20-DCP/40 Storage Port Expander; provides a multiplexed interface to a single local storage access port for up to 4 requestors	3,550	19	95	75
F1946-02	1100 Series ISI Interface; provides a full-duplex ISI interface to a word channel; maximum of 1 per DCP/10A or DCP/15 cabinet, 2 per DCP/20 cabinet, or 4 per DCP/40 cabinet	4,000	23	110	89
F1947-02	Host Byte Interface; provides interface to Series 90 byte multiplexer channel or 1100 Series block multiplexer channel; maximum of 1 per DCP/20 cabinet or 2 per DCP/40 cabinet (not available for DCP/10A or DCP/15)	4,000	25	105	85
F1947-03	Host Byte Interface; provides interface to 1100 Series block multiplexer channel; for DCP/10A or DCP/15	4,000	23	105	85
F3878-00	Byte Interface Line Module; provides 8-bit interface to the 8409 disk subsystem	1,900	11	56	45
F1948-01	16-bit Peripheral Interface; provides interface to a peripheral subsystem; allows operation in 8- or 16-bit mode (for DCP/20 and DCP/40)	3,000	16	84	68
F1941-00	Full-Duplex Interface to Asynchronous Data Sets; conforms to EIA RS-232-C and CCITT V.24 and V.28; data set rates up to 2400 bps	960	3	25	20
F1942-00	Full-Duplex Interface to Synchronous Data Sets; conforms to EIA RS-232-C and CCITT V.24 and V.28; data set rates up to 9600 bps	960	3	26	21
F3163-00	Full-Duplex Interface to Synchronous or Asynchronous Modems; conforms to EIA RS-232-C and CCITT V.24 and V.28; operates with Bell DDS up to 9600 bps or at data set rates up to 19,200 bps	1,275	8	35	30
F3163-01	Full-Duplex Interface to Public Data Networks; conforms to CCITT X.21 and X.25; operates at rates up to 19,200 bps	2,500	14	63	50
F3163-04	Full-Duplex Interface to Synchronous Modems; conforms to RS-449; up to 9600 bps	1,920	11	50	40
F3164-00	Full-Duplex Interface to Bell 303 Modem; up to 64K bps	7,200	38	188	150
F3164-01	Full-Duplex Interface to Carrier Facilities; conforms to CCITT V.35; operates with UDLC protocol data formats (64K bps), V.35 facilities (48K bps), and Bell DDS and DSDS facilities (56K bps)	3,745	21	100	80
F3165-01	Multiline Asynchronous Line Module; provides full-duplex interfaces to up to 4 data sets; conforms to RS-232-C and CCITT V.24 and V.28; up to 2400 bps	2,880	14	79	63
F3837-99	Multiline Asynchronous Line Module; provides full-duplex interfaces to up to 4 data sets or direct-connect terminals; conforms to RS-232-C and CCITT V.24 and V.28; up to 9600 bps	2,250	18	94	63
F3837-00	Multiline Synchronous Line Module; provides up to 4 full-duplex interfaces to data sets or direct-connect terminals; conforms to RS-232-C and CCITT V.24 and V.28; up to 19.2K bps	2,250	18	94	63
F3835-00	Remote Partitioning Capability; maximum of 1 on DCP/20 or 4 on DCP/40 (not available for DCP/10A or DCP/15)	960	5	25	20
F1945-00	Auto Dialing Line Module; interfaces to Bell 801 Automatic Calling Units or those conforming to CCITT V.24 and V.25	1,005	4	25	20
8590-00	Remote Control Module (RCM); provides the capability to control power on/off and other functions of up to 4 DCP processors; requires RCM Adapter, F3163-00 or F3163-04, and/or 1 or 2 F3556-00s and F3557-00s	13,526	61	355	280
F3898-00	Remote Control Adapter for DCP/10A and DCP/15; provides interface between the RCM and the DCP	1,915	11	50	40
F2893-00	Remote Control Adapter for DCP/20	1,824	11	48	38
F1937-00	Remote Control Adapter for DCP/40	1,824	11	48	38
2523-00	Line Switch Module (LSM); provides the capability to switch communications lines and/or peripherals from a local or remote source; requires 1 switch feature; up to 6 switch features supported	28,750	112	748	597
1962-00	LSM Auxiliary Cabinet for DCP/20 and DCP/40; provides mounting for up to 10 switch features	6,872	42	197	143
F3557-00	RCM/LSM Microcode	350	1	9	7
F3556-00	RCM/LSM Local Control Interface; provides one loadable line module for the RCM and LSM and one for the DCP	3,600	16	95	75
F3105-00	Modem Expander; enables a second RCM or LSM to share a single RS-232-C modem	1,440	4	38	30
F3109-00	RS-232-C Switch; provides the capability to switch 8 RS-232-C communications lines from one communications controller to another	4,930	22	132	102
F3110-00	CCITT V.35 Switch; up to 8 lines	9,325	43	245	195
F3112-00	RS-449 Switch; up to 4 lines	6,000	27	156	125
F3113-00	16-bit Parallel Interface Switch; up to 4 interfaces (not for DCP/10A)	7,200	33	188	150
F3559-00	Bell 303 Switch; up to 4 lines (not for DCP/10A)	16,800	82	440	350

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.



## Unisys 2200/200 Series

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	(\$)	(\$)	(\$)
F1939-00	Integrated Diskette Subsystem for DCP/20 and DCP/40; includes 256KB diskette and controller	1,920	12	53	42
8408-02	Cartridge Disk Control; controls up to 2 F2380 drives (for DCP/20 and DCP/40)	5,564	32	146	109
F2380-04	Fixed/Removable Cartridge Disk Drive; five megabytes fixed, five megabytes removable	17,750	124	461	330
F2187-00	Second I/O Interface for dual F2380 configuration	1,568	9	39	29
8409-99	Disk Subsystem; includes cabinet, control, and one 4.6MB disk drive; requires Byte Interface Line Module, F3878-00 (not for DCP/15)	9,650	82	378	280
8409-97	Disk Subsystem; same as 8409-99, except it includes a 14MB drive	10,746	94	478	354
F3900-00	Disk Drive Expansion; provides a second disk drive with 4.6MB capacity; maximum of one	3,777	54	158	117
F3900-01	Disk Drive Expansion; provides a second disk drive with 14MB capacity; maximum of one	4,207	66	188	139
F4085-00	Disk Drive Expansion; expands the capacity of one 4.6MB drive to 14MB	1,096	12	100	74
F3881-00	Dual Disk Control; provides a second DCP interface	2,000	9	65	50
F4158-01	Integrated Disk Drive for DCP/15; 20MB	2,000	20	83	56
8441-78	8441 Disk Subsystem; 30MB; connects to DCP/15	4,200	28	175	116
F4228-98	Additional 8441-78 Disk Drive	2,710	26	112	75
8441-79	Disk Subsystem; includes cabinet, controller, and 30MB disk drive; connects to DCP/10A	4,200	28	175	116
F4228-98	Disk Expansion; provides additional 30MB disk drive for 8441-79	2,710	26	112	75
8441-81	Disk Subsystem; includes cabinet, controller, and 30MB disk drive; connects to DCP/20 and DCP/40	4,200	28	175	116
F4228-99	Disk Expansion; provides additional 30MB disk drive for 8441-81	3,560	11	148	98
O871-01	Uniservo 10 Magnetic Tape Unit; PE/NRZI, 1600/800 bps, 25 ips (for DCP/20 and DCP/40)	13,962	93	318	239
F2721-00	Uniservo 10 Controller; controls up to 2 drives	10,320	56	284	215
F2879-00	AC Power Switch; provides remote control of second Uniservo 10	1,200	5	32	25
O445-97	High Definition Quality Printer; 160/40 cps; connects to DCP/20 or DCP/40	895	20	49	27
F4224-00	Paper Roll for O445 Printers	45	1	3	2
F4109-00	Forms Tractor	50	1	3	2

\*Lease prices do not include maintenance.

\*\*On-call annual maintenance.

NA—Not available.

## SOFTWARE PRICES

		Single Extended Term Charge* (\$)
<b>Operating System</b>		
8987-99	System Software for 2200/201/202; includes the OS 1100 System Control Software (SCS) pregenerated as General-Purpose Typical Executive (GPTE) with required utilities and other software including TIP, PEF1, TAVR, DMS 1100, OIAP, and SLRR; included for limited use are CMS 1100, MCB, and DPS 1100 which allows terminals and workstations attached to a WCU to be used either as consoles or communications terminals	21,332
8987-98	System Software for 2200/203/204; same as 8987-99	42,667
8987-97	GPTE 203/204 Upgrade; required when a Model 201 or 202 is upgraded to a Model 203 or 204	21,335
8986-99	Mixed Mode Executive for 2200/201 and 2200/202 (includes both object and source code)	45,332
8986-98	Mixed Mode Executive for 2200/203 and 2200/204	66,667
8986-97	Mixed Mode Executive 203/204 Upgrade	21,335
8987-96	GPTE with SHIELD support for 2200/201 and 2200/202	26,705
8987-95	GPTE with SHIELD support upgrade for 2200/203 and 2200/204	21,335
8986-96	Mixed Mode Executive with SHIELD support for 2200/201 and 2200/202	50,715
8986-95	Mixed Mode Executive with SHIELD support upgrade for 2200/203 and 2200/204	21,335
8994-99	SHIELD Control Software upgrade for non-SHIELD	5,385

\*License for a 5-year period.

## Unisys 2200/200 Series

Single  
Extended  
Term  
Charge\*  
(\$)

### Language Processors

6153-95	ASCII Cobol	6,399
6154-95	ASCII Fortran	14,688
6243-94	RPG II Group	4,992
6160-95	Macro	4,848
6165-97	General Syntax Analyzer	3,958
6827-98	NPE UCOB New Programming Environment Cobol	18,000
F6125-96	NPE UCOB Debug Interface	750
F6125-95	NPE UCOB RDMS Interface	2,500
F6125-89	NPE UCOB DMS Interface	3,500
F6125-92	NPE UCOB IBM Tape Interface	3,500
9571-99	NPE C New Programming Environment C Language	10,000
F6190-99	NPE C Debug Interface	750
7670-97	NPE UFTN Fortran	9,360
F6151-98	NPE UFTN Fortran Debug Interface	750
F6151-95	NPE UFTN Fortran RDMS Interface	750
6256-97	NPE Support; linking and runtime services	6,500
6273-97	NPE UPAS Pascal	8,000
F6126-98	NPE UPAS Pascal Debug Interface	750

### Data Base Management and Data Management

6292-96	Universal Data System (UDS) 1100 Control	8,278
6700-95	UDS Data Management System (DMS) 1100	43,471
6298-92	UDS Query Language Processor (QLP) 1100	14,688
6298-91	UDS QLP with PCIOS Interface	17,136
6293-97	UDS Relational Data Management System (RDMS) 1100	31,050
6299-96	UDS Data Dictionary System	20,699
6177-95	Define File Processor	2,400
6175-92	IRU Version II	24,729
7747-98	UDS Shared File System (SFS)	8,278
6155-96	Data Management System (DMS) 1100	60,720
6176-97	Data Dictionary System (DDS)	21,140
6152-95	Processor Common Input/Output System (PCIOS)	1,066
6244-95	Information Management System (IMS) 1100	7,488
6866-98	Relational Syntax Analyzer	8,278
6157-91	Query Language Processor (QLP) 1100	23,461
6157-90	QLP with PCIOS Interface	27,323

### Data Communications

8709-00	Programmable Line Module (PLM)/RJE	4,267
8710-00	PLM/BSC 3270	4,267
8711-00	PLM/DDP	4,267
8712-00	PLM/UTS	2,132
8713-00	PLM/SX 1100	2,132
8714-00	PLM/X.25	4,267
8715-00	PLM/X.21	4,267
8716-00	PLM/SNA	4,267
8717-00	PLM/NTR	4,267
8718-00	PLM/OIS	2,132
9535-00	PLM/TP	2,132
6169-78	Communications Management System (CMS) 1100 License Expansion; allows use of CMS 1100 beyond the limited use included in the GPTE or Mixed Mode Executive license; supports a Telcon DCA network	7,440
6159-95	Processor Common Communication System (PCCS)	4,848
6136-92	DCP/10, DCP/15 Operating System	6,750
6136-95	DCP/20 Operating System	9,000
6136-01	DCP/40 Operating System	16,425
6249-97	Message Control Bank (MCB) License Expansion; allows use of MCB beyond the limits of the GPTE or Mixed Mode Executive license	3,888
8859-99	Remote Batch File Transfer/Extended (RBFTE)	4,500
7681-99	On-Line Transfer/1100	1,599
7683-99	On-Line Disk/1100	6,399

\*License for a 5-year period.

## Unisys 2200/200 Series

		<b>Single Extended Term Charge* (\$)</b>
<b>Program Development</b>		
6146-93	Mapper 1100 (16 users)	37,536
6146-92	Mapper 1100 (17+ users)	56,304
6146-91	Mapper 1100 17+ Upgrade	18,768
6734-98	Cobol Editor	1,448
6239-95	Programmers Advanced Debugging System (PADS) 1100	8,064
6170-97	Conversational Time-Sharing System (CTS) 1100	14,491
6262-97	Interactive Processing Facility (IPF) Command Language	11,457
6260-97	IPF Control	4,139
6263-97	IPF Procedures	14,490
6245-95	IPF Edit 1100	12,006
6264-97	User Assistance	3,105
6261-97	Distributed Data Processing (DDP) 1100	4,139
7623-90	SX 1100; 16 users	9,600
7623-89	SX 1100; 32 users	14,400
7623-86	SX 1100 Upgrade; from 16 to 32 users	4,800
<b>Utilities</b>		
6162-95	Checkpoint/Restart	4,848
6271-97	CULL Processor	1,036
F3859-97	Interactive CULL (IACULL)	1,036
6135-97	Sort/Merge	6,209
6246-97	Log Analyzer	4,966
6161-97	Performance Analysis Routines	12,006
6274-97	On-line System Activity Monitor (OSAM)	6,209
<b>Miscellaneous Products</b>		
6237-96	Display Processing System (DPS) 1100 License Expansion; allows use of DPS 1100 beyond the limited purpose included in the GPTE or Mixed Mode Executive license	13,536
6753-98	Percon Control; provides support for peripheral devices such as printers	2,070
F6115-97	Percon Control for 0776 and 0447 Printers	3,589
F6115-98	Percon Control for 0789 Printers	3,589

\*License for a 5-year period. ■