

Unisys 1100/60

MANAGEMENT SUMMARY

UPDATE: In 1986, Sperry Corporation, the developer of the 1100/60 system, was acquired by Burroughs Corporation. The combined companies are doing business as Unisys Corporation. No significant changes have been made to the 1100/60 system for at least two years. This model line is still being marketed, but new customers would opt for the more powerful 1100/70 Series, which provides a better price/performance ratio.

The 1100/60 system was the first mainframe to make use of multiple-microprocessor architecture. The arithmetic and logic portions of the 1100/60 employ sets of nine microprocessors combined with ECL circuitry and multilayer packaging. These sets, termed microexecution units, concurrently execute parts of the same microinstructions for improved throughput.

This innovative system has effectively been replaced by the newer 1100/70 system, although the vendor continues to market the 1100/60. Current customers can upgrade their 1100/60 systems to an equivalent 1100/70 system. Both product lines support the same peripherals, communications equipment, and software.

The 1100/60 processors are available in seven basic models. The entry-level B and C models include no buffer storage, the medium-performance E models include 2K words of buffer storage, and the high-performance H models include 8K words of buffer storage. Models B1, C1, E1, and H1 use the standard 1100 Series instruction set. Models C2, E2, and H2 include the Extended Instruction Set (EIS), which is designed to enhance the performance of high-level languages and system software. The C1, E1, and

The 1100/60 family includes both uni-processor and multiprocessor configurations. The systems incorporate a multiple-microprocessor implementation of the 1100 Series architecture.

MODELS: 1100/61 B1, C1, C2, E1, E2, H1, and H2; 1100/62 E1MP, E2MP, H1MP, and H2MP; 1100/63 H1MP and H2MP; and 1100/64 H1MP and H2MP.

CONFIGURATION: From 1 to 4 CPUs, 512K to 8192K words (2MB to 32MB) of memory, 1 to 4 IOUs, and 1 to 7 consoles.

COMPETITION: Honeywell DPS 8 and IBM 303X, 4341, and 4361.

PRICE: Purchase prices range from \$236,519 for an 1100/61 B1 to \$2,817,332 for an 1100/64 H2.

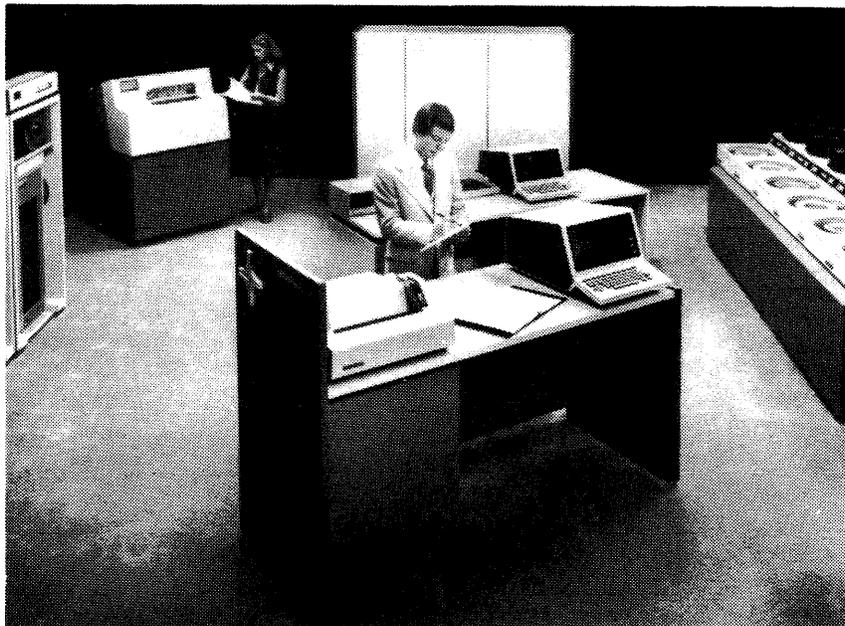
CHARACTERISTICS

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

MODELS: 1100/61 B1, C1, C2, E1, E2, H1, and H2; 1100/62 E1MP, E2MP, H1MP, and H2MP; 1100/63 H1MP and H2MP; and 1100/64 H1MP and H2MP.

DATA FORMATS

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



The 1100/60 system supports up to four central processors and up to 8192K words of main memory. A single processor configuration can include a maximum of four consoles; a multiprocessor configuration, a maximum of seven consoles.

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TABLE 1. SYSTEM COMPARISON

MODEL	1100/61 B1	1100/61 C1, C2	1100/61 E1, E2	1100/61 H1, H2
SYSTEM CHARACTERISTICS				
Date announced	—	June 1979	June 1979	June 1979
Date first delivered	—	January 1980	January 1980	January 1980
Field upgradable to	1100/61 C1	1100/61 E1, E2, H1, H2	1100/61 H1, H2; 1100/62 E1, E2	1100/62 H1, H2
Relative performance*	1.0	1.2 (C1), 1.5 (C2)	1.8 (E1), 2.1 (E2)	2.7 (H1), 3.2 (H2)
Number of processors	1	1	1	1
Cycle time, nanoseconds	116	116	116	116
Word size, bits	36	36	36	36
Operating systems	1100 OS	1100 OS	1100 OS	1100 OS
MAIN MEMORY				
Type	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS
Minimum capacity, bytes	2M	2M or 4M	2M or 4M	2M or 4M
Maximum capacity, bytes	4M	16M	16M	32M
Increment size	2MB	2MB or 4MB	2MB or 4MB	2MB or 4MB
Cycle time, nanoseconds	580	580	580	580
BUFFER STORAGE				
Minimum capacity, bytes	Not applicable	Not applicable	8K	32K
Maximum capacity, bytes	—	—	8K	32K
Increment size	—	—	—	—
INPUT/OUTPUT CONTROL				
Number of channels:				
Byte multiplexer	Not available	Not available	Not available	Not available
Block multiplexer	2 to 5	2 to 5	2 to 5	2 to 5
Word	4 to 12	4 to 12	4 to 12	4 to 12
Other	—	—	—	—

*Relative performance ratings based on an 1100/61 Model B1 equaling 1.0.

➤ H1 can be upgraded to a C2, E2, or H2 with the addition of the EIS. In addition, the B model can be upgraded to E models, and the E models can be upgraded to H models.

Seven uniprocessor configurations and eight multiprocessor configurations are available. The 1100/61, 1100/62, 1100/63, and 1100/64 systems include one, two, three, and four central processors, respectively. An 1100/61 system can include any processor model in the 1100/60 Series. An 1100/62 system can include a Model E1, E2, H1, or H2 processor. The 1100/63 and 1100/64 Systems can be configured with Model H1 or H2 processors only.

The 1100/62 Model E1 or E2 comes packaged as a dual-processor system and can also be configured by adding a Multiprocessor Upgrade feature to an 1100/61 E1 or E2. Multiprocessor Upgrade features are available to upgrade a Model H1 or H2 from an 1100/61 to an 1100/62, an 1100/62 to an 1100/63, or an 1100/63 to an 1100/64.

The basic 1100/60 Processor Complex consists of the CPU, main memory, buffer storage (Models E and H only), System Support Processor (SSP), I/O Unit (IOU), and system console with printer. Multiprocessor systems also include a maintenance console. The SSP provides system management, support for diagnostics and maintenance, and console handling. Each standard IOU includes one block multiplexer channel and four word channels.

Originally, main memory was housed in the 1100/60 processor cabinet. However, the memory capacity of the 1100/60 systems was expanded by adding a separate memory cabinet for Models C, E, and H. Main memory capacity ➤

➤ **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 leftmost 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. The 1100/60 C2, E2, and H2 models can perform decimal addition and subtraction operations on 9-bit bytes, packed 4 to a word.

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 ones 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 1024.

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 1100 processors are not code-sensitive and can manipulate data in 6-bit, 9-bit, 12-bit, or 18-bit codes.

MAIN MEMORY

The 1100/60 systems use both internal and external main memory. Memory housed in the processor cabinet uses 16K-bit chips; the newer external memory uses 64K-bit chips. ➤

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TABLE 1. SYSTEM COMPARISON (Continued)

MODEL	1100/62 E1, E2	1100/62 H1, H2	1100/63 H1, H2	1100/64 H1, H2
SYSTEM CHARACTERISTICS				
Date announced	June 1979	June 1979	June 1979	June 1979
Date first delivered	January 1980	January 1980	January 1980	January 1980
Field upgradable to	1100/63 H1, H2	1100/63 H1, H2	1100/64 H1, H2	1100/71
Relative performance*	3.4 (E1), 4.1 (E2)	5.1 (H1), 6.2 (H2)	7.4 (H1), 9.0 (H2)	9.7 (H1), 11.6 (H2)
Number of processors	2	2	3	4
Cycle time, nanoseconds	116	116	116	116
Word size, bits	36	36	36	36
Operating systems	1100 OS	1100 OS	1100 OS	1100 OS
MAIN MEMORY				
Type	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS	16K- or 64K-bit NMOS
Minimum capacity, bytes	4M	2M or 4M	2M or 4M	2M or 4M
Maximum capacity, bytes	32M	32M	32M	32M
Increment size	2MB or 4MB	2MB or 4MB	2MB or 4MB	2MB or 4MB
Cycle time, nanoseconds	580	580	580	580
BUFFER STORAGE				
Minimum capacity, bytes	8K per CPU	32K per CPU	32K per CPU	32K per CPU
Maximum capacity, bytes	8K per CPU	32K per CPU	32K per CPU	32K per CPU
Increment size	—	—	—	—
INPUT/OUTPUT CONTROL				
Number of channels:				
Byte multiplexer	Not available	Not available	Not available	Not available
Block multiplexer	2 to 5	2 to 5	2 to 5	2 to 5
Word	4 to 12	4 to 12	4 to 12	4 to 12
Other	—	—	—	—

*Relative performance ratings based on an 1100/71 Model B1 equaling 1.0.

➤ ranges from 512K words (2 megabytes) to 1024K words (4 megabytes) on the B model, 512K words to 4096K words (16 megabytes) on the C models, and from 512K words to 8192K words (32 megabytes) on the E and H models. The older memory is composed of 16K-bit chips, but the newer external memory uses 64K-bit chips. Users with older systems can upgrade to the external memory unit by ordering the appropriate memory upgrade features. Customers can order new 1100/60 C, E, and H systems with a minimum of 1024K words housed in the external memory cabinet.

Mass storage equipment available for the 1100/60 system includes fixed-head drums, disk pack drives, and fixed-disk drives. Storage capacities range from 1.17 megabytes to 5.1 gigabytes. Also available are several Cache/Disk Systems, hierarchical mass storage systems that provide a level of memory between the 1100/60 CPU and the disk drives. (The 1100/61 Model B1 does not support a Cache/Disk System.)

Unisys offers a variety of magnetic tape drives in both 7- and 9-track models, with data transfer rates ranging from 40,000 to 1,500,000 bytes per second. Also available are 8 line printer models with speeds ranging from 760 to 2000 lines per minute and a laser printer with a print speed of 10,500 to 21,000 lines per minute.

Data communications capabilities are strongly emphasized. Four Distributed Communications Processor (DCP) models are available to serve as front-end processors, network processors, or remote concentrators. The DCPs support UDLC, bisynchronous, synchronous, and asynchronous transmission. Depending on the model, the

➤ Storage protection is provided through Bank Descriptor Registers (BDRs) loaded by the 1100 Operating System define the upper and lower boundaries of both the instruction areas and data areas that may be referenced by the currently active user program. Any attempt to reference an address beyond these limits causes a guard mode interrupt. The setting of a bit in the Designator Register determines whether the protection is against write operations; read, write, or jump operations; or whether no protection exists. Registers BDR0 and BDR1 correspond to I-bank (instruction word) address ranges and Registers BDR2 and BDR3 correspond to D-bank (data word or operand) address ranges.

STORAGE TYPE: See Table 1.

CAPACITY: See Table 1.

CYCLE TIME: Read/write cycle time of 580 nanoseconds; 625 nanosecond access to corrected read data; and 928 nanosecond partial write cycle. Memory refresh takes 24 nanoseconds. Single and partial word writes are available. In multiprocessor systems, storage modules may be interleaved under control of the System Support Processor (SSP) software.

CHECKING: The Main Storage Unit (MSU) contains circuitry for single-bit error detection and correction and detection of double-bit errors. 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 IOU interfaces. The MSU also detects single-bit address errors and out-of-bounds addresses.

RESERVED STORAGE: The low end of memory is reserved for storing the processor state during interrupts. The processor state consists of the program status, addressing

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▷ DCPs can accommodate from 8 to 1,016 communications lines.

In addition to the DCPs, the 1100/60 also supports the older General Communications Subsystem (GCS). The GCS supports communications networks of up to 32 half- or full-duplex lines at up to 56,000 bits per second.

The Distributed Communication Architecture continues to be a viable technology in the vendor's overall communications philosophy. Under the DCA concept, according to Unisys, continued compatibility of present and future products will be ensured by specifying interfaces and functions of all components and providing guidelines for the building of communications networks.

COMPETITIVE POSITION

Uniprocessor 1100/60 systems offer performance similar to the IBM 4300 Series. Multiprocessor 1100/60 systems are comparable in performance to the Burroughs B 6900 (now the Unisys B 6900), the IBM 303X Series, and the low-end Honeywell DPS 8 systems.

However, the 1100/60 systems are primarily of interest to users who already have an 1100/60. The newer 1100/70 systems offer the same memory capacities and configuration possibilities as the 1100/60 systems, at a much lower cost. Unisys may enhance the 1100/70; it is unlikely to enhance the 1100/60.

ADVANTAGES AND RESTRICTIONS

The 1100/60 system is upward compatible with the newer 1100/70 system. The user's hardware and software investment is protected, because all of the 1100 Series systems use the same operating system and most of the same peripherals and communications equipment.

The 1100/60 features multiple microprocessors and a number of reliability and availability features. However, at this stage in its life cycle, the 1100/60 is unlikely to be chosen by new customers. The 1100/70, which has the same architecture, offers improved performance at lower cost.

Within the 1100 Series, the vendor has maintained a high degree of program and data compatibility. This has been continued with the 1100/60, both on the source and object level. There is no direct program compatibility, at the machine or assembly-language level, between the 1100 Series and any other line of Unisys or competitive computers. The 1100 Series implementations of the Cobol, Fortran, Algol, Basic, PL/1, and Pascal languages, however, are generally in accordance with the accepted standards for these languages. The 1100 Series systems originally used the 6-bit Fielddata code, but in an effort to resolve the resulting compatibility problems, all of the hardware and software were gradually revised to make use of ASCII. Thus, for most practical purposes, an 1100 Series computer can now be considered a byte-oriented ASCII machine. ▷

▷ status, and interrupt status. Interrupt routines and the general register stack are also located in the low end of memory.

CENTRAL PROCESSOR

All models of the 1100/60 employ the same basic 116 nanosecond CPU, which is a multiple-microprocessor implementation of the 1100 Series architecture. The 1100/60 utilizes the Motorola 10800 as an LSI building block. The Motorola 10800 is a 4-bit slice with a 70 microinstruction repertoire using 10K ECL technology. The 1100/60 contains two microexecution units each composed of nine 10800 components. The two microexecution units concurrently execute parts of the same microinstruction (see below). Complete execution of every microinstruction requires four cycles. Speed is enhanced by overlapping execution of microinstructions. To further increase performance, microprocessor functions are generated using a phantom branching technique in which one of two functions is selected for execution in each microprocessor, one cycle after microaddress selection.

The concept of availability, reliability, and maintainability (ARM) was an important consideration in the design of the 1100/60 processor, according to the vendor. To implement ARM, duplicates were provided for the microinstruction units, executing the same function on the same data in the duplicate unit and comparing the results at the end of each cycle. Similarly, the shifter, logic function section, and control store address generator are also duplicated. The 1100/60 also includes a hardware instruction retry mechanism that allows the system to recover from most transient faults, transparent to the operating environment.

The hardware monitor feature enables an 1100/60 to collect system profile performance data on hardware and software. Sampling of data can be initiated by software or operator request. The signals are sampled every 475 microseconds and collected by the System Support Processor (SSP) every 30 seconds for storage in the system log for later report generation.

The 1100/60 processor also includes an interprocessor interrupt interface that allows operational control by the operating system to permit a CPU to interrupt another CPU or to be interrupted by another CPU in a multiprocessor environment.

The *General Register Stack (GRS)* consists of 36-bit integrated circuit registers with a basic cycle time of 116 nanoseconds. The GRS includes 128 program-addressable control registers with some overlap of function and some areas guard-mode protected (e.g., the executive system of the operating system).

The 1100/60 has an *address range* of 16 million words. Both indirect and direct addressing are possible. Indirect addressing is possible to any desired number of levels, with full indexing capabilities at each level. Operand addresses can be modified by the contents of any of 19 index registers. If desired, the contents of the index register can be automatically incremented by any specific value each time the register is referenced.

The 1100/60 *instruction set* includes 161 standard instructions. To a great extent, the instruction repertoire is identical with that of the other 1100 Series systems in order to maintain compatibility. To utilize the full capabilities of the 1100/60 system, additional privileged instructions are included, and an optional Extended Instruction Set (EIS) is also available. ▷

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➤ USER REACTION

Twenty-six 1100/60 users responded to Datapro's 1986 computer users survey. Industries represented included manufacturing (38 percent), government (19 percent), retail/wholesale (19 percent), and engineering/scientific (11 percent). The 1100/60 systems had been installed for an average of 56 months.

Several of the survey questions asked the users about their hardware configurations. Main memory capacity on the 1100/60 systems ranged from 1 to 32 megabytes, with 34 percent having between 1 and 4 megabytes. Only 4 percent of the systems had memory capacities exceeding 16 megabytes. The majority of the systems (54 percent) included between 1.2 and 4.8 gigabytes of disk storage, while 4 percent were using more than 10 gigabytes. Thirty-eight percent of the 1100/60 users had installed more than 60 local workstations/terminals, while 23 percent had installed more than 60 remote terminals.

Of the 26 respondents, 25 said they had converted to the 1100/60 from another system. Fifty-two percent had converted from an older Sperry 90 Series or 1100 Series model. The others had previously used a wide variety of systems from different manufacturers, including IBM, Honeywell, and Digital.

The users were asked to rate their systems in 14 different categories. The users' ratings of the 1100/60 systems are summarized in the table below.

	Excellent	Good	Fair	Poor	WA*
Ease of operation	7	16	3	0	3.15
Reliability of mainframe	14	11	1	0	3.50
Reliability of peripherals	5	18	2	1	3.04
Maintenance service:					
Responsiveness	10	14	1	0	3.36
Effectiveness	6	17	1	0	3.21
Technical support:					
Troubleshooting	3	15	7	0	2.84
Education	2	11	10	2	2.52
Documentation	1	12	10	3	2.42
Manufacturers software:					
Operating system	8	13	5	0	3.12
Compiler & assemblers	3	21	1	0	3.08
Application programs	1	6	13	3	2.22
Ease of programming	3	19	4	0	2.96
Ease of conversion	1	15	6	3	2.56
Overall satisfaction	5	18	3	0	3.08

*Weighted Average on a scale of 4.0 for Excellent.

We compared the users' ratings of the 1100/60 with the ratings earned by the newer 1100/70, because the 1100/70 system is simply an enhanced version of the 1100/60. As might be expected, the ratings were very similar. For example, the 1100/60 earned a weighted average of 3.08 in the Overall Satisfaction category, while the 1100/70 scored 3.05. The rating in the Reliability of Mainframe category was 3.50 for the 1100/60, and 3.51 for the 1100/70. The 1100/60 did better in the Ease of Conversion category (the 1100/70 earned a rating of 2.40), but the 1100/70 earned the higher score in Ease of Programming (3.04).

➤ Most instructions specify the address of one operand in main storage and one of the accumulators. Complete binary arithmetic facilities are provided for single-precision fixed-point and both single- and double-precision floating-point operands. Addition and subtraction can also be performed on double-precision fixed-point operands and on 18-bit half-words and 12-bit third-words. Also included are extensive facilities for testing, shifting, searching, and logical operations.

The instruction set is broken down as follows: 11 load instructions, 8 store instructions, 20 fixed-point arithmetic instructions, 16 floating-point arithmetic instructions, 14 repeated search instructions, 14 test or skip instructions, 12 shift instructions, 17 executive system control instructions, 29 jump instructions, 4 logical instructions, 11 miscellaneous instructions, 5 I/O instructions, and 29 optional EIS instructions.

EIS includes bit string instructions for moving, comparing, and translating character or byte fields; decimal arithmetic and edit instructions; and instructions for converting between ASCII, decimal and binary notation. According to the vendor, gains realized by the use of EIS can be expected to be in the range of 25 to 35 percent for heavy Cobol/DMS batch environments.

A *program interrupt facility* causes storage of the current processor state in the three groupings of program status, address status, and interrupt status from the Processor State Register's contents and a transfer of control to the Operating System whenever one of the following conditions occurs: completion of an I/O operation, abnormal condition in an I/O subsystem, processor or storage fault, program error, or program-requested interrupt.

There are 24 priority level interrupts available in the 1100/60. Priority levels 0 through 10 are internal interrupts, which can neither be locked out nor deferred. The remainder are external interrupts which can be both locked out and deferred. All external interrupts are presented to each CPU in the system. Therefore, an interlocked synchronization mechanism is provided to ensure that only one CPU actually accepts the interrupt request.

In addition to the CPU and main memory, the 1100/60 systems include the *Storage Interface Unit (SIU)*, which houses the buffer storage. Buffer capacity is 2048 words (8K bytes) per CPU in E models and 8192 words (32K bytes) per CPU in H models. A read request results in a serial retrieval of a four-word block from the MSU—the requested word and three adjacent words. Subsequent read references to the same or adjacent words in the block are presented at SIU speed with no further reference to the MSU required. The words in the buffer are divided into 512 sets. Each set contains four 4-word blocks. The SIU employs a paired least recently used (PLRU) algorithm to control aging and replacement of data blocks within each set. In case of buffer malfunction, the affected blocks are automatically bypassed.

SPECIAL FEATURES: The *System Support Processor (SSP)* provides partitioning, system control, maintenance, and console management functions. The SSP is a standalone desk-sized unit that interfaces to the CPU complex and its component parts including the CPU, IOU, MSU, and SIU. A basic configuration for the SSP includes CRT/keyboard/printer console, 128K bytes of addressable storage, a console interface, diskette drive interface, remote maintenance interface, and central complex interface.

The partitioning function provides the ability to assign individual central-complex units of a system to either one of two independent smaller systems, or to isolate a unit from either application for off-line concurrent maintenance. Partitioning is supported via partitioning panel displays. The

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TABLE 2. MASS STORAGE

MODEL	FH-432/FH-1782 Drums	8450	8470	8480	8481	8490
Cabinets per subsystem	1 to 8	1 to 32	1 to 32	1 to 8	1 to 4	1 to 4
Disk packs/HDAs per cabinet	—	1 HDA	1 HDA	4 HDAs	4 HDAs	4 to 8 HDAs
Capacity*	1.17MB/9.4MB	243MB	403MB	1.6GB	2.5GB	2.5GB to 5.1GB
Tracks/segments per drive unit	384/1,536	16,800	20,160	80,000	67,328	—
Average seek time, msec.	—	14.7	14.7	14.7	16	18
Average access time, msec.	4.3/17.0	23	23	23	29.9	26.3
Average rotational delay, msec.	—	8.3	8.3	8.3	13.9	8.3
Data transfer rate	1.08M bytes/sec.	1.26M bytes/sec.	2.09M bytes/sec.	2.09M bytes/sec.	1.8M bytes/sec.	1.8M bytes/sec.
Controller model	5012	5040	5056	5056	5057	5090
Comments	Models FH-432 and FH-1782 can be intermixed on the same system	Can be configured as part of a cache/disk subsystem	Can be configured as part of a cache/disk subsystem	Can be configured as part of a cache/disk subsystem	Can be configured as part of a cache/disk subsystem	Can be configured as part of a cache/disk subsystem

*Capacity based on 112-word records

➤ We also asked the users if they would recommend their systems to other users. Eighty-one percent said “yes,” 12 percent said “no,” and the remainder were undecided. □

➤ SSP also defines special system protection modes such as realtime and maintenance modes.

The partitioning function also indicates the operational status of each central-complex unit. These status conditions are available to system software for configuration control. The ability to control the partitioning of subsystems is also provided.

The SSP acts as a primary maintenance tool through functions such as control storage loading, fault corrections, scan/set data comparisons, error logging, and a remote maintenance capability. The SSP also acts as the communications link between the 1100/60 and the system console(s).

The 1100/60 *Attached Virtual Processor (AVP)* is a special-purpose processor that provides a migration path from the byte-oriented Series 90/60 and 90/80 systems to the word-oriented 1100/60 System. The 1100/60 AVP can be attached to any processor model in the 1100/60 family except Model B1. Performance is comparable to the 90/80-3. The AVP provides concurrent execution of applications written for the VS/9 operating system and applications written for the 1100 Series operating system.

The 1100/60 AVP incorporates system features found in both Series 90 and 1100/60 processors. On the VS/9 side, the hardware includes a CPU with a logic bus structure and microcode control similar to the Sperry 90/80 family. In addition, the reliability features of the 90/80, such as parity checking, control store, and duplicate adders, have been maintained and applied to the AVP. The 1100/60 System Support Processor (SSP) is also included, and provides partitioning, system control, maintenance, and console management functions.

The system's main memory ranges from 512K (2 megabytes) to 1024K words (4 megabytes). An 8K-word (32K bytes) cache unit provides buffer storage of instructions and data between the 1100 Main Storage Unit (MSU) and the AVP CPU.

PHYSICAL SPECIFICATIONS: The 1100/60 central complex cabinet is 30 inches deep, 78 inches wide, and 64 inches high. The cabinet weighs approximately 1500 pounds. Power requirements for the basic CPU complex cabinet is 7 kVA, 60 Hz. A motor alternator is not required. Cooling required by the CPU complex is less than 1500 cubic feet per minute forced air, supplied from room air or false floor. Heat dissipation is less than 24,000 Btus per

hour. Recommended temperature for the typical system is 75 degrees Fahrenheit with a relative humidity of 50 percent noncondensing.

CONFIGURATION RULES

The 1100/61 Model B1 consists of the 1100/60 CPU with 512K words (2 megabytes) of main memory expandable to 1024K words (4 megabytes), one IOU with a second optional, one SSP, and one system console. Up to three additional system consoles can be configured.

The 1100/61 Model C1 consists of the 1100/60 CPU with 512K or 1024K words (2 or 4 megabytes) of main memory expandable to 4096K words (16 megabytes), one IOU with a second optional, one SSP, and one system console. Up to three additional consoles are optional. The additional consoles may be system consoles with printers or auxiliary consoles without printers. The 1100/61 Model C2 is the same as the C1 with the addition of the Extended Instruction Set (EIS).

The 1100/61 Model E1 consists of the 1100/60 CPU with 512K or 1024K words of main memory expandable to 8192K words (32 megabytes), one IOU with a second optional, one 2K-word (8K-byte) SIU, and one SSP. The console configuration is the same as for the 1100/61 Model C1. The 1100/61 Model E2 is the same as the E1 with the addition of the EIS.

The 1100/62 Model E1 consists of two 1100/61 Model E1 systems in a tightly coupled multiprocessor configuration. Similarly, the 1100/62 Model E2 consists of two 1100/61 Model E2 systems. The maximum main memory capacity of these systems is 8192K words—4096K words per processor. A maximum of five additional consoles is permitted in an 1100/62 Model E1 or E2 configuration. One auxiliary console, interfaced to both SSPs, is required as a maintenance console. The other additional consoles can be system consoles or auxiliary consoles.

The 1100/61 Model H1 consists of the 1100/60 CPU with 512K or 1024K words of main memory expandable to 8192K words, one IOU with a second optional, one 8K-word (32K-byte) SIU, and an SSP. The console configuration is the same as for the 1100/61 Model C1. The 1100/61 Model H2 is the same as the H1 with the addition of the EIS.

The 1100/62 Model H1 is configured by adding an H1 Multiprocessor Upgrade to an 1100/61 Model H1 system. The upgrade includes a second H1 processing complex without main memory. Main memory can be expanded to 8192K words. The 1100/62 Model H2 is the same as the H1 with the addition of the EIS. The console configuration for

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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.
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 30	7	200	NRZI	200	40,000
	7	556	NRZI	200	111,000
	7	800	NRZI	200	160,000
	9	800	NRZI	200	160,000
	9	1600	PE	200	320,000
Uniservo 32	9	1600	PE	75	120,000
	9	6250	GCR	75	470,000
Uniservo 34	9	1600	PE	125	200,000
	9	6250	GCR	125	780,000
Uniservo 36	9	1600	PE	200	320,000
	9	6250	GCR	200	1,250,000
Uniservo 40	18	37,871	—	79	1,500,000
Printers	Printing Speed	Print Positions	Horizontal Spacing, Chars./Inch	Vertical Spacing, Lines/Inch	Form Size, Inches
0770-00	800 lpm	132	10	6 or 8	3.5 to 22 wide, 24 long
0770-02	1400 lpm	132	10	6 or 8	Same
0770-04	2000 lpm	132	10	6 or 8	Same
0770-06	2000 lpm	136	10	6 or 8	4 to 20 wide, 8 to 22 long
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
0777 Laser Printer	10,500 to 21,000 lpm	136, 164, or 204	10, 12, or 15	6, 8, or 12	6.5 to 15.8 wide, 7 to 14 long

► the 1100/62 Model H1 or H2 is the same as for the 1100/62 Model E1 or E2.

The 1100/63 and 1100/64 Model H1 configurations consist of an 1100/62 Model H1 system plus one or two additional CPUs and SIUs. The 1100/63 and 1100/64 multiprocessor upgrades do not include main memory, an SSP, or a system console. Main memory can be expanded to a maximum of 8192K words, regardless of the number of CPUs. The 1100/63 or 1100/64 Model H2 configuration is the same as the H1 with the addition of the EIS. The console configuration for the 1100/63 and 1100/64 Model H1 or H2 is the same as for the 1100/62 Model E1 or E2.

On the 1100/61 Model B1, main memory is housed in the processor cabinet. An external memory cabinet is available for Models C, E, and H. The external cabinet can house 1024K to 4096K words, with expansion in 1024K-word increments. Two memory cabinets are required to house the

maximum of 8192K words permitted on a Model E or H system. Various memory expansion features are available to expand the memory capacity of existing 1100/60 Model C, E, and H systems with less than 1024K words of memory. Customers can also order an 1100/60 Model C, E, or H system with a minimum of 1024K words of memory housed in the external cabinet.

Minimum peripheral equipment required to complete an 1100/60 system includes one 0776 Printer Subsystem, an 8470 Disk Subsystem with one control unit and two disk drives, and a Uniservo 22/24 Magnetic Tape Subsystem with one control unit and two Uniservo 22 or 24 tape drives.

As an alternative, a minimum system can include one 0770 Printer Subsystem, one 8430/8433/8450 Disk Subsystem with one control unit and two disk drives, and one Uniservo 3X Magnetic Tape Subsystem with one control unit and two Uniservo 30, 32, 34, or 36 tape drives. ►

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INPUT/OUTPUT CONTROL

All 1100/60 models contain one Input/Output Unit (IOU). The IOU consists of a central control module (CCM) and up to five or six channel modules. The CCM provides independent control paths to up to two CPUs and up to two SSPs and data paths to/from up to two MSUs and the channel modules. The CCM processes all I/O instructions, passes control information to the channel modules, controls main storage requests, updates control words and format status words, and generates all interrupt requests.

Each channel module consists of either one block multiplexer channel or four word channels. The basic IOU contains one word channel module and one block multiplexer channel. A fully configured IOU can consist of 2 block multiplexer channels and 12 word channels, 3 block multiplexer channels and 8 word channels, or 5 block multiplexer channels and 4 word channels.

Individual word channels operate in one of three modes: 36-bit Internally Specified Index (ISI), 18-bit Externally Specified Index (ESI), or 9-bit ESI. The ISI mode word channel has one subchannel assignment. The ESI mode word channel has up to 64 subchannels, while the block multiplexer channel has up to 128 subchannels for concurrent operation. Each IOU can support up to 1024 subchannels. One subchannel is reserved for the status table, leaving 1023 for use by the system.

The maximum block multiplexer channel data rate is 1.66 million bytes per second. The maximum word channel data rate is 0.60 million words per second in ISI mode. The aggregate output data rate for a word channel module (four channels) operating in ISI mode is 0.86 million words per second. The aggregate input data rate for a word channel module is 1.4 million words per second.

One input or output operation on each I/O channel can occur simultaneously with computation in each processor. Moreover, the Externally Specified Index (ESI) mode permits multiple remote communications devices to transmit data to and from main storage in multiplexed fashion over a single I/O channel. All installed processors and IOUs can operate simultaneously and independently, with interference occurring only when two or more of these units simultaneously attempt to access the same storage module.

The microinstruction execution units utilize overlap execution techniques, with one new microinstruction starting each cycle.

MASS STORAGE

Disk subsystems supported on the 1100/60 are listed in Table 2.

The *Cache/Disk System* is available in three versions: the original 8450/8470/8480 Cache/Disk System, the 8481 Cache/Disk System, and the 8490 Cache/Disk System. The first two are essentially the same, except for the disk drives supported.

The Cache/Disk Systems are hierarchical mass storage systems that provide a level of memory between the 1100/60 processor and the appropriate disk drives. The 8450/8470/8480 Cache/Disk System consists of one or two 5057-XX Cache/Disk or Solidstate Disk (SSD) Processors, up to four 7053 Storage Units, and up to sixteen 8450, 8470, or 8480 disk units. The 8481 Cache/Disk System consists of two 5057-XX Cache/Disk or SSD Processors, up to four 7053 Storage Units, and up to four 8481 disk units.

The 5057 Cache/Disk Processor controls all data access functions, including indexing, searching, buffering, storage

management, staging and destaging of data to and from disk, and error recovery. The 7053 Storage Unit contains 917,504 words (4 megabytes) of semiconductor memory. It can be configured as cache memory, as a solidstate disk, or both.

In Cache/Disk mode, data is automatically transferred from the disk to the 7053 Storage Unit. The host computer accesses data as if it were stored on the disks. A separate indexing feature, the Segment Descriptor Table (SDT), is required in one of the 7053 units. The SDT contains a list of disk addresses that point to cache storage areas containing duplicates of data in recently referenced disk space. When an index find occurs, data transmission between the cache and the host CPU begins in about one millisecond. If an index miss occurs, the 5057 processor issues a seek to disk and disconnects for other activity.

In Solidstate Disk (SSD) mode, the 5057 SSD Processor manages storage consisting of up to four 7053 cache storage units to be used exclusively in the solidstate disk mode. No caching or disk attachment is provided. In SSD mode, the 7053 is directly addressed by the host processor. The access time in this mode is approximately 0.2 millisecond. In both Cache/Disk and SSD modes, the response time is improved by eliminating the seek and latency time required by the disk drives.

The 8490 Cache/Disk System performs in a similar manner to the systems described above, but it does not use the 7053 storage unit. The basic 8490 Cache/Disk System is available with two 5090 control units, eight disk modules providing 5 gigabytes of storage, and a cache/disk capability. An SSD unit and controller and a standard disk subsystem are also available.

Also offered is the *5071/8652 Optical Disk System*, which includes a 2.6-gigabyte optical disk unit and a controller. An optical disk library provides an automatic disk changer (jukebox style) that supports up to 32 disk cartridges. The optical disk system provides automated electronic storage of millions of documents.

The *Shared System* is based on Britton-Lee's relational data base machine. The system is designed to offload the 1100 Series mainframe and provide faster access to information. The basic Shared System includes a data base processor with 2 megabytes of memory, an 1100 host interface, a data base administrator's workstation, and 600 megabytes of disk storage. The system can be expanded to include 6 megabytes of memory, 2 host interfaces, 15 workstations, and 5 gigabytes of disk storage. Interfaces are available to permit the 1100 Series processor to communicate with an IBM mainframe or with Unisys (Sperry) personal computers.

INPUT/OUTPUT UNITS

Magnetic tape drives and printers supported on the 1100/60 are listed in Table 3. Punched card equipment is listed in the "Equipment Prices" section at the end of this report.

TERMINALS

Please refer to Table 4 for some of the terminals that can be used with the 1100/60 systems.

COMMUNICATIONS

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 1100/60 and other 1100 Series host processors, as a network nodal processor, or as a

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TABLE 4. TERMINALS

MODEL	UTS 10	UTS 20	UTS 40
DISPLAY PARAMETERS			
Max. chars./screen	1,920	1,920	1,920
Screen size (lines x chars.)	24 X 80	24 X 80	24 X 80
Symbol formation	7 X 11 dot matrix	7 X 11 dot matrix	7 X 11 dot matrix
Character phosphor	P31 green	P31 green	P31 green
Total colors/no. simult. displayed	—	—	—
KEYBOARD PARAMETERS			
Style	Typewriter	Typewriter	Typewriter
Character/code set	128 ASCII	96 ASCII	96 ASCII
Detachable	Standard	Standard	Standard
Program function keys	12 std.	22 std.	22 std.
OTHER FEATURES			
Buffer capacity	1,920 characters	4,000 characters	4,000 characters
Tilt/swivel	Optional	Optional	Optional
Graphics capability	—	—	—
TERMINAL INTERFACE	EIA RS-232-C, CCITT V.24, Current Loop (using TTY protocol)	EIA RS-232-C, CCITT V.24, (using UNISCOPE protocol)	EIA RS-232-C, CCITT V.24, (using UNISCOPE protocol)

► 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.

Four DCP models are available: the DCP/10A, DCP/15, DCP/20, and DCP/40. The entry-level DCP/10A includes a processor, 512K bytes of memory, and communications line modules. The DCP/10A supports 8 half- or full-duplex communications lines.

The DCP/15, announced in October 1986, will supersede the DCP/10A. The DCP/15 includes a processor, from 2 to 4 megabytes of memory, integrated diskette, integrated hard disk, and communications line modules. It supports up to 52 full-duplex communications lines.

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.

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 Series 1100 or Series 90 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. DCP/20 accommodates asynchronous, synchronous, and wideband transmission at up to 64K bits per second. It supports Universal Data Link Control (UDLC) as well as character-oriented communications protocols.

The DCP/40 system includes a processor with 512K to 4096K bytes, 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 over 60 macroinstructions 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 increased memory permits larger and more complex user applications to be included in a single DCP. In addition, the DCP/40 may front-end either 1100 Series or 90 Series mainframes, and supports up to 1,016 half- or 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 over 285 instructions is available to the user for the generation, assembly, and loading of message handling routines.

The Telcon-controlled system performs all message control operations. As users access the system (network), predetermined routing paths are followed, or alternate routes are selected using predefined table search routines should established paths become unavailable. Specialized I/O controllers (frequently microcoded modules) handle specific functions, including terminal interfaces and line, trunk, or channel control.

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

DCP message switching can be achieved through user-coded applications which use the message routing facilities inherent in the Telcon software. Message routing among terminals, host systems, and network-resident applications is achieved either through user definition in the network generation process or by a dynamic selection through network management services.

If multiple DCPs are configured in the network, each is assigned both specific and network-common responsibilities. For example, all messages remain the responsibility of the originating DCP until accepted by another DCP or end user. Under normal conditions, main memory is used to maintain message queues and buffers, with disk storage

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► used for overflow. Terminal and line handlers are placed as close to the terminals or gateway links as possible, usually in the nearest DCP. This philosophy permits as much of the network as possible to consist of high-speed trunk lines, and allows the low-speed lines running a variety of different terminal protocols, character codes, transmission speeds, and modes to be minimized.

In addition to off-loading the host, the DCP affords a degree of network reliability and resiliency to the user. The stand-alone capability of a single network DCP may permit continued message acceptance and storage of data during periods of temporary inaccessibility to a given host or terminal. Similarly, multiple DCPs may be redundantly configured to maximize network uptime or to increase network throughput. The user is free to mix and match all of the communications processors and subsystems thus far discussed into an efficient communications network. Cost may be a limiting factor in providing increased sophistication.

The Telcon operating system supports local disk and magnetic tape storage for their respective DCPs. This support permits functions including store and forward message switching, logging, journalization, file management, and monitoring.

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.

The *General Communications Subsystem (GCS)* is an older communications system that enables an 1100/60 system to receive and transmit data via any common carrier. It can accommodate up to 32 half- and/or full-duplex communications lines at speeds of up to 56,000 bits per second, under direct program control of the central processor. The GCS consists of a Communications Terminal Controller that connects to a processor ESI I/O channel and acts as a multiplexer to from 1 to 32 Communications Terminals and Communications Interfaces. However, the 1100/61 Model B1 processor supports a maximum of 16 high-speed Communications Terminals. Each Communications Terminal/Communications Interface combination can accommodate one half-duplex or one full-duplex line. Transmission is in asynchronous or synchronous bit-serial mode, using codes of 5, 6, 7, or 8 levels. The asynchronous interfaces can handle speeds ranging from 45.45 to 2400 bits per second, while the synchronous interface can handle line speeds of up to 56,000 bits per second. In addition to the bit-serial interfaces, an automatic dial interface is available.

SOFTWARE

OPERATING SYSTEM: All 1100 Series systems utilize the *1100 Operating System*, which supports batch, transaction, realtime, and interactive processing in multiprogramming, multiprocessing, and distributed processing environments. The heart of the 1100 Operating System is the Executive, which supports user program processing.

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 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. (More comprehensive facilities for interactive operations are provided by

the Interactive Processing Facility, Conversational Time-Sharing, and High-Volume Time-Sharing systems, described later in this report.)

Realtime and communications programs, which are subject to specific time constraints, receive top-priority handling by the 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. Communications control facilities for transaction processing are provided by the Communications Management System and the Transaction Interface Package, described later in this report.

Multiprocessing is handled as a logical extension of the 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.

A number of *system management tools* are available for Executive system management, upgrading, and testing. These include the Customer On-site Maintenance and Installation System (COMUS), the Quota system, and Fault Location by Interpretive Testing (FLIT).

- 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.
- The Quota System enables 1100 Series installations to control the use of system resources by both batch and demand users. Each installation can establish account and individual limits through user identification codes for use of system resources. With the Quota System, installations can prevent users from requesting the use of system resources beyond an account budget or a preassigned limit, control the number of concurrent demand and batch runs executing in the system, and define limits to be applied to resources available to demand and/or batch jobs at specified times.
- Fault Location by Interpretive Testing (FLIT) provides the capability to execute and diagnose the Executive while running as a normal user program under Executive control. Thus, a new version of the Executive or a planned new configuration can be studied and tested in a "virtual" environment prior to its use as the production Executive system. FLIT may also be used to debug programs.

In addition, the 1100 Executive can dynamically monitor and record system activity. The Software Instrumentation Package (SIP) provides a tool for system throughput and response optimization.

A number of *system processors* are available, including the Site Administration Package (SIMAN), Checkpoint/Res- ►

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▶ start, Memory Allocation Processor, Post-Mortem Dump Processor (PMD), Element Processor (ELT), Procedure Definition Processor (PDP), File and Program Utility Processor (FURPUR), and Data Processor.

- 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 also is 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.
- Checkpoint/Restart snapshots a run or program and creates a checkpoint that may be used for restarting at a later time if, desired.
- The Memory Allocation Processor provides for the collection and interconnection of relocatable elements produced by the compilers to produce an executable program.
- The Postmortem Dump Processor 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.
- The Element Processor is used to insert symbolic, relocatable, absolute, or omnibus elements into a program file from images in the runstream.
- The Procedure Definition Processor processes symbolic elements that may contain Assembler, Fortran, or Cobol procedures and produces entries in the table of contents of a program file.
- The File and Program Utility Processor consists of a set of file maintenance routines that provide for the management and manipulation of cataloged or temporary files containing data or programs.
- Data Processor provides data handling capabilities at the file level.

PROGRAMMING LANGUAGES: The 1100/60 supports Cobol, Fortran, APL, Pascal, Algol, Basic, PL/1, and RPG. Also available is the Macro general-purpose processor, which extends host languages through its ability to process character strings.

DATA BASE MANAGEMENT: *DMS 1100* is a comprehensive data base management system developed under the guiding principles of the CODASYL Data Base Task Group. It is designed to satisfy the need for standardized data management techniques that provide: 1) separation of the data definition and data manipulation functions, 2) an acceptable degree of data independence, 3) data base protection and integrity, and 4) 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, Fortran, and PL/1 to allow these host languages to manipulate the data base via DMS 1100. The Data Management Routine, the key operational compo-

nent of DMS 1100, maintains the data base and preserves its integrity. The Data Reorganization 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 ability 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.

DATA 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), and File Administration System (FAS).

The UDS 1100 Control is the on-line data manager of the UDS system, 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.

PCIOS is designed to ensure compatible data file formats. It supports sequential, indexed sequential, and multikeyed sequential access methods for APL, PL/1, 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.

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.

The Define File Processor provides a data file description external to the program processing the file. Using DFP, programs written in Fortran, Cobol, PL/1, APL, and RPG are file-format-independent and can share common files.

The Integrated Recovery Utility provides the user with English-language commands to initiate a variety of integrity features and capabilities. IRU can be used to control user access to selected TIP or TIP/DMS files or to provide partial file access. It can also be used to compare complete or partial records between files. ▶

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► The File Administration System is a functional successor to the Secure file administration processor. FAS provides extensive file handling and control within an Interactive Processing Facility system environment. FAS includes capabilities for mass storage file backup, archiving, and reporting. It also provides for the administration of hierarchical files and directories.

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

The *Remote Processing System (RPS) 1100* is an interactive data management and file processing system that provides access to system resources by a nonprogramming-oriented user interface through a Uniscope 100 or Uniscope 200 CRT display terminal. RPS 1100 data base files are created and maintained under DMS 1100, and the system interfaces with TIP for transaction interfacing and control. RPS 1100 provides a set of generalized system functions which can be invoked by the user via the terminal. These include commands to ENTER, BUILD, DESTROY, or FORM a file; to process a file through SEARCH, MATCH, or SORT; to build an INDEX structure to line item data and data fields for faster access; to perform computations on specified fields; and to request printing of reports in user-specified formats. RPS 1100 provides tutorial assistance to end users by displaying a choice of functions for user selection and utilizing "fill-in-the blanks" techniques to permit users to enter commands.

DATA COMMUNICATIONS: The 1100 Operating System supports two communications processing packages: the Communications Management System (CMS 1100) and the Processor Common Communication System (PCCS 1100), as well as the Distributed Communications Architecture (DCA).

The *Communications Management System* is the communications network interface for all 1100 Series processors to a DCA-based DCP/Telcon network. It has been separated from the 1100 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 an 1100 Series computer network. It acts as the communications "front-end" to the Transaction Interface Package (TIP), and handles polling, parity checking, data blocking, data packing and unpacking, message envelope formatting, message acknowledgement, message queuing, and other message control procedures. The message queue can be maintained in main and/or auxiliary storage; this common data pool is then accessed by the Transaction Interface Package. 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. Typical main storage residence requirements for CMS are 10K to 12K words.

The *Processor Common Communication System* provides a means by which application programs developed in high-level languages such as Cobol and PL/1 can utilize the Series 1100 communications system. Programs using PCCS 1100 can communicate with other communication programs, terminal users, remote batch systems, and certain host computers.

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

Whether network control is host-dependent or host-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. The host may be either an 1100 mainframe running under the 1100 operating system, or a 90 Series CPU, Model 60 or 80, running the VS/9 operating system.

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 DCP 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 for control codes rather than whole characters. (Hence the nomenclature "bit-oriented.") This characteristic permits much more control information to be contained in the same or smaller amount of message space.

PROGRAM DEVELOPMENT: *Mapper 1100* is a realtime 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.

ADVISE 1100 provides a set of easy-to-use tools for data definition, data interaction, and application development. ADVISE 1100 furnishes the query, update, and application development interface to RDMS 1100, so that users can design and access relational data bases.

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 Basic, Fortran, Cobol, Algol, and APL. CTS provides the user with a simplified command language editor. Although still available, CTS has effectively been superseded by the newer Interactive Processing Facility, which is described below. ►

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► 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 eight separately priced modules. The IPF Command Language is the primary interface for using IPF. It is based on CODASYL specifications. The development of command language subroutines and macros is accomplished through the IPF Procedures module. The Distributed Data Processing module supports file transfers and job submissions from 1100 Series to 1100 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.

SX 1100 is a Unix System V-based 1100 OS application program 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 1100 OS demand processing, and the ability to access and write 1100 OS 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, Fortran, and PL/1, but it may also be used for programs written in Assembler.

UTILITIES: The 1100 Operating System supports 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 "middleman" 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, Assembly Language, or PL/1 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. The system operates in conjunction with the Transaction Interface Package or the Conversational Time-Sharing System. 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.

A number of application packages are provided for the 1100/60, including the following: Unis 1100, a manufacturing package that includes bill of materials processor, inventory control, and planning and scheduling modules; the Unidis distribution system with freight waybill, wholesale, transportation equipment, and message switching packages; the Unifacs 1100 financial system; Sufics 1100 (Sperry Univac Financial Integrated Control System 1100); the MSA 1100 accounting system; and ICES (Integrated Civil Engineering System).

PRICING AND SUPPORT

POLICY: The 1100/60 is available for purchase or a one-year or five-year lease. All software except the operating system is unbundled. The vendor also offers a seven-year lease to state and local governments and to educational institutions. Educational institutions are eligible for an additional 10 percent discount. The discount does not apply to maintenance service charges.

SUPPORT: On-site operating system support can be obtained for a flat monthly fee. Support is available for some unbundled 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. The premiums for additional coverage are a percentage of the base maintenance rate and are as follows:

	HOURS OF COVERAGE								
	4	8	9	10	12	16	18	20	24
Monday through Friday	—	—	100	105	110	115	120	125	130
Saturday	5	8	9	—	11	15	—	14	15
Sunday and Holidays	7	10	12	—	14	16	—	18	20

Maintenance service performed outside the contracted maintenance period is subject to the following rates:

	Monday through Friday (\$)	Saturday, Sunday and Holidays (\$)
Min. charge per call	228	258
Each addl. hour	114	129

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► Users who elect not to contract for maintenance pay the same rates on a per-call basis.

The Total Remote Assistance Center (TRACE) is a remote hardware maintenance facility located in Roseville, Minnesota. TRACE is available to 1100/60 system customers via a dedicated WATS number 24 hours per day and seven 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 courses, both self-study courses and lecture courses, are offered. Instruction is available for both hardware and software systems. Lecture courses held at a Unisys (Sperry) site range in price from about \$100 to \$2,800 per student. Group rates are available.

TYPICAL CONFIGURATIONS: The following systems illustrate some of the configurations that are possible within the 1100/60 family. All necessary hardware and control units are included in the indicated prices, but software is not included.

1100/61 MODEL B1:

3072-23 Processor Complex with 512K words of main memory, one IOU, one SSP, and one system console with printer	\$ 236,519
One 5056-83 Disk Controller	43,750
Two 8470-99 Disk Drives (806MB)	54,720
One 5058-00 Uniservo 22 Subsystem with control unit and 2 tape drives	71,040
One 0776-02 Printer (900 lpm)	41,340
One Print Cartridge	1,270
TOTAL PURCHASE PRICE:	\$ 448,639

1100/62 MODEL E2:

3062-78 Processor Complex with 2 CPUs, 1024K words of main memory, 2K words of buffer storage, 2 IOUs, 2 SSPs, one maintenance console, and 2 system consoles with printers	\$1,096,816
Three 2004-99 Storage Expansions (2048K words), for a system total of 4M words	300,000
One 5057-83 Disk Controller	43,750
Four 8470-99 Disk Drives (1.6GB)	109,440
One 5055-99 Uniservo 26/28 Control	22,700
Six 0884-02 Uniservo 28 Tape Drives	148,500
Two 0776-04 Printers (1200 lpm)	96,000
Two Print Cartridges	2,540
TOTAL PURCHASE PRICE:	\$1,819,746

1100/64 MODEL H2:

3062-90 Processor Complex with one CPU, 1024K words of main memory, 8K words of buffer storage, one IOU, one SSP, one maintenance console, and one system console with printer	\$ 888,709
One 3062-84 Model H2 Multiprocessor Upgrade (same components as 3062-90)	656,209
Two 3062-62 Model H2 Multiprocessor Upgrades (CPUs and IOUs only)	1,272,414
One 7049-99 MSU (1024K words)	232,500
Five 2004-99 Storage Expansions (5120K words) for system total of 8M words	500,000
Two 3542-94 Auxiliary Consoles	23,148
One 5057-83 Disk Controller	43,750
Eight 8470-99 Disk Drives (3.2GB)	218,880
One 8470 Dual Access Feature	1,920
One 5055-99 Uniservo 26/28 Control	22,700
Eight 0884-02 Uniservo 28 Tape Drives	198,000
Two 0770-06 Printers (2000 lpm)	120,000
Two Print Cartridges	924
TOTAL PURCHASE PRICE:	\$4,179,154

EQUIPMENT PRICES

		Monthly Charges*			
		Purchase (\$)	Monthly Maint. (\$)	1-Year Lease (\$)	5-Year Lease (\$)
PROCESSORS					
3042-23	1100/61 Model B1 Standard Processing Complex; includes CPU with standard instruction set, 512K words of main memory; an IOU with one block multiplexer channel and one word channel module (4 channels), a System Support Processor (SSP), and a system console with printer (limited availability)	236,519	1,000	—	4,463
3072-23	1100/61 Model B1 Standard Processing Complex; same as 3042-23 but supports IOU Expansion F3751-00	236,519	1,000	—	4,463
3042-99	1100/61 Model C1 Standard Processing Complex; includes CPU with standard instruction set, 512K words of main memory, an IOU as in Model B1, an SSP, and a system console with printer	336,519	1,342	8,007	6,346
3042-96	1100/61 Model C2 Standard Processing Complex; same as 3042-99 but with Extended Instruction Set	375,100	1,458	8,925	7,074
3062-99	1100/61 Model C1 Standard Processing Complex; same as 3042-99 but with 1024K words of main memory housed in a separate cabinet	493,469	1,542	11,744	9,308
3062-96	1100/61 Model C2 Standard Processing Complex; same as 3062-99 but with Extended Instruction Set	532,050	1,658	12,662	10,036
3072-99	1100/61 Model C1 Standard Processing Complex; same as 3042-99 but supports IOU Expansion F3751-00	336,519	1,342	8,007	6,346

*Lease charges do not include maintenance.

**Field Installation Charge.

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Monthly Charges*

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

► PROCESSORS (Continued)

3072-96	1100/61 Model C2 Standard Processing Complex; same as 3042-96 but supports IOU Expansion F3751-00	375,100	1,458	8,925	7,074
3042-75	1100/61 Model E1 Medium Performance Processing Complex; includes CPU with standard instruction set, 512K words of main memory, 2K-word high-speed buffer, integrated multiprocessor capability, one IOU, one SSP, a system console with printer, and a maintenance console	547,519	1,692	13,035	10,328
3042-72	1100/61 Model E2 Medium Performance Processing Complex; same as 3042-75 but with Extended Instruction Set	586,100	1,808	13,951	11,056
3062-75	1100/61 Model E1 Medium Performance Processing complex; same as 3042-75 but with 1024K words of main memory housed in a separate cabinet	704,469	1,892	16,772	13,290
3062-72	1100/61 Model E2 Medium Performance Processing Complex; same as 3062-75 but with Extended Instruction Set	743,050	2,008	17,688	14,018
3072-75	1100/61 Model E1 Medium Performance Processing Complex; same as 3042-75 but supports IOU Expansion F3751-00	547,519	1,692	13,035	10,328
3072-72	1100/61 Model E2 Medium Performance Processing Complex; same as 3042-72 but supports IOU Expansion F3751-00	586,100	1,808	13,951	11,056
3042-93	1100/61 Model H1 High Performance Processing Complex; includes CPU with standard instruction set, 512K words of main memory, 8K-word high-speed buffer, integrated multiprocessor capability, one IOU, one SSP, a system console with printer, and a maintenance console	693,177	2,042	16,505	13,077
3042-90	1100/61 Model H2 High Performance Processing Complex; same as 3042-93 but with Extended Instruction Set	731,759	2,158	17,423	13,805
3062-93	1100/61 Model H1 High Performance Processing Complex; same as 3042-93 but with 1024K words of main memory housed in a separate cabinet	850,127	2,242	20,242	16,039
3062-90	1100/61 Model H2 High Performance Processing Complex; same as 3062-93 but with Extended Instruction Set	888,709	2,358	21,160	16,767
3072-93	1100/61 Model H1 High Performance Processing Complex; same as 3042-93 but supports IOU Expansion F3751-00	693,177	2,042	16,505	13,077
3072-90	1100/61 Model H2 High Performance Processing complex; same as 3042-90 but supports IOU Expansion F3751-00	731,759	2,158	17,423	13,805
3042-81	1100/62 Model E1 Multiprocessor Complex; includes two CPUs with standard instruction set, 1024K words of main memory, a 2K-word buffer in each CPU, two IOUs, two SSPs, two system consoles with printers, and one maintenance console	938,254	3,499	22,340	17,703
3042-78	1100/62 Model E2 Multiprocessor Complex; same as 3042-81 but with Extended Instruction Set	1,015,416	3,732	24,175	19,159
3062-81	1100/62 Model E1 Multiprocessor Complex; same as 3042-81 but with main memory housed in a separate cabinet	1,019,654	3,499	24,278	19,240
3062-78	1100/62 Model E2 Multiprocessor Complex; same as 3062-81 but with Extended Instruction Set	1,096,816	3,732	26,113	20,696
3072-81	1100/62 Model E1 Medium Performance Processing complex; same as 3042-81 but supports IOU Expansion F3751-00	938,254	3,499	22,340	17,703
3072-78	1100/62 Model E2 Medium Performance Processing Complex; same as 3042-78 but supports IOU Expansion F3751-00	1,015,416	3,732	24,175	19,159
3064-99	1100/60 Attached Virtual Processor; includes CPU with 512K to 1024K words of main memory and 32K-byte buffer; main storage interface unit; interprocessor interface; one byte multiplexer channel; one externally specified index attachment; VS/9 facility; AVP console; and Attached Processor Control Software (not available for B1 processors)	132,040	455	2,669	2,357
F3627-00	AVP Block Multiplexer Channel	16,430	60	390	310
0986-00	Inter Processor Channel Coupler; connects an 1100 Series system and a Series 90 VS/9 system via block multiplexer or selector channels	20,000	55	440	375

SYSTEM UPGRADES

K3919-05	Floating Point Enhancement for 1100/60 B1	5,300	—	126	100
K3919-04	Floating Point Enhancement for 1100/60 C, E, and H models	5,300	—	126	100
2002-84/-97	1100/61 to 1100/71 Upgrade; upgrades 1100/61 with 0.5M words of main memory to 1100/71 with 1.0M words	90,000	50	2,990	2,250
2002-83/-96	1100/61 to 1100/71 Upgrade; upgrades 1100/61 with 0.75M words to 1100/71 with 1.0M words	75,000	25	2,495	1,875
2002-82/-95	1100/61 to 1100/71 Upgrade; upgrades 1100/61 with 1.0M words to 1100/71 with 1.0M words	60,000	—	1,995	1,500

*Lease charges do not include maintenance.

**Field Installation Charge.

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

► SYSTEM UPGRADES (Continued)

2002-92	1100/62 to 1100/72 Upgrade; upgrades 1100/62 with 1.0M words to 1100/72 with 2.0M words	180,000	100	5,980	4,500
2002-91	1100/62 to 1100/72 Upgrade; upgrades 1100/62 with 1.25M words to 1100/72 with 2.0M words	165,000	75	5,485	4,125
2002-90	1100/62 to 1100/72 Upgrade; upgrades 1100/62 with 1.5M words to 1100/72 with 2.0M words	150,000	50	4,985	3,750
2002-89	1100/62 to 1100/72 Upgrade; upgrades 1100/62 with 1.75M words to 1100/72 with 2.0M words	135,000	25	4,490	3,375
2002-88	1100/62 to 1100/72 Upgrade; upgrades 1100/62 with 2.0M words to 1100/72 with 2.0M words	120,000	—	3,990	3,000

(Other upgrades are available at the same prices for CPUs with serial numbers 3001 and above)

2017-99/98	1100/61 Model B1 to Model C1 Upgrade	100,000	342	2,376	1,883
F2917-00	Model Upgrade; makes 1100/61 Model C1, E1, or H1 into equivalent of C2, E2, or H2 through the addition of the Extended Instruction Set	96,453	117	2,456	1,947
1952-99	Model Upgrade; makes 1100/61 Model C1 into H1 or C2 into H2	356,659	700	9,063	7,201
1952-96	Model Upgrade; makes 1100/61 Model C1 into E1 or C2 into E2	211,000	350	5,379	4,262
1952-95	Model Upgrade; makes 1100/61 Model E1 into H1 or E2 into H2; two required to upgrade a multiprocessor system	224,050	350	5,706	4,521
3042-69	Model E1 Multiprocessing Upgrade; adds a second E1 processing complex to 3042-75 together with transfer switches to allow either System Support Processor (SSP) to attach to the maintenance console and the remote maintenance modem	469,127	1,808	11,172	8,851
3042-66	Model E2 Multiprocessing Upgrade; same as 3042-69 but adds E2 to E2	507,708	1,925	12,090	9,579
3062-69	Model E1 Multiprocessing Upgrade; adds a second E1 processing complex to 3062-75 together with transfer switches to allow either SSP to attach to the maintenance console and the remote maintenance modem	393,577	1,608	9,373	7,426
3062-66	Model E2 Multiprocessing Upgrade; same as 3062-69 but adds E2 to E2	432,158	1,725	10,291	8,154
3072-69	Model E1 Multiprocessing Upgrade; same as 3042-69 but adds 3072-75 and supports IOU Expansion F3751-00	469,127	1,808	11,172	8,851
3072-66	Model E2 Multiprocessing Upgrade; same as 3042-66 but supports IOU Expansion F3751-00	507,708	1,925	12,090	9,579
3042-87	Model H1 Multiprocessing Upgrade; adds a second H1 processing complex to 3042-93 together with transfer switches to allow either SSP to attach to the maintenance console and the remote maintenance modem	693,177	2,158	16,504	13,077
3042-84	Model H2 Multiprocessing Upgrade; same as 3042-87 but adds H2 to H2	731,759	2,275	17,423	13,805
3062-87	Model H1 Multiprocessing Upgrade; adds second H1 processing complex to 3062-93 together with transfer switches to allow either SSP to attach to the maintenance console and the remote maintenance modem	617,627	1,958	14,705	11,652
3062-84	Model H2 Multiprocessing Upgrade; same as 3062-87 but adds H2 to H2	656,209	2,075	15,624	12,380
3062-63	Model H1 Multiprocessing Upgrade; adds a third or fourth H1 processing complex to 3062-87 (or upgraded 3042/3072 equivalent) to form an 1100/63 or 1100/64 system; does not include main memory, SSP, or system console	597,625	1,800	14,229	11,276
3062-62	Model H2 Multiprocessing Upgrade; same as 3062-63 but adds H2 to H2	636,207	1,916	15,148	12,004
3072-87	Model H1 Multiprocessing Upgrade; same as 3042-87 but adds 3072-93 and supports IOU Expansion F3751-00	693,177	2,158	16,504	13,077
3072-84	Model H2 Multiprocessing Upgrade; same as 3042-84 but supports IOU Expansion F3751-00	731,759	2,275	17,423	13,805

PROCESSOR OPTIONS

F2869-00	Performance Monitor; provides scannable buffered counters within a processing complex to allow the system support processor to collect selected performance parameters; one required per complex in multiprocessor systems	32,151	23	803	637
F2688-01	IOU Expansion for 3062 and 3072 systems; provides space for up to two word channel modules and one block multiplexer channel; one per processor complex; mutually exclusive with F2916-01 and F3751-00	8,722	23	271	216
F2916-00	IOU Expansion for 3042 systems; provides space for up to two block multiplexer channels and one word channel module; one per processor complex	8,722	23	271	216
F2916-01	IOU Expansion; same as F2916-00 but for 3062 and 3072 systems; mutually exclusive with F2688-01 and F3751-00	8,722	23	271	216
F3751-00	IOU Expansion for 3062 and 3072 systems only; provides space for four additional block multiplexer channels; one per processor complex; mutually exclusive with F2688-01 and F2916-01	16,500	75	472	367

*Lease charges do not include maintenance.

**Field Installation Charge.

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		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	Maint.	Lease	Lease
			(\$)	(\$)	(\$)
▶ PROCESSOR OPTIONS (Continued)					
F2684-00	Word Channel Module for 3042 systems; provides four additional independent word channel interfaces; for use with F2916-00	17,425	105	515	410
F2684-01	Word Channel Module; same as F2684-00 but for 3062 and 3072 systems; for use in F2688-01 and F2916-01	17,425	105	515	410
F2690-00	Block Multiplexer Channel for 3042 systems; provides interface for up to eight byte-oriented control units; for use with F2916-00	13,876	70	433	343
F2690-01	Block Multiplexer Channel; same as F2690-00 but for 3062 and 3072 systems; for use in F2688-01, F2916-01, or F3751-00	13,876	70	433	343
F2867-00	Shared Peripheral Interface (SPI) Control; provides capability to control up to six word control units, each with up to four SPI interfaces	16,105	23	404	321
F2904-00	Byte Channel Transfer Switch Control; provides capability to control one fully configured 4 by 8 byte channel transfer switch; maximum of 2 F2867-00 or F2904-00 per processing complex	16,105	23	404	321
2521-00	Channel Transfer Switch for block multiplexer channels; free-standing cabinet contains operator controls for manual switching of 4 subsystem strings, a primary module with 2 x 1 switch, and power and space for 4 x 8 switching	19,781	81	489	365
2521-02	Channel Transfer Switch for remote operation	19,781	81	489	365
F2600-00	Primary Module Expansion; adds a switch for one subsystem string; maximum of 3 per 2521-00 or F2601-00; maximum of one per F2601-01	586	—	14	11
F2601-00	Additional Primary Module; adds a second 2 x 1 primary module and operator control for switching up to 4 subsystem strings	10,476	44	273	194
F2601-02	Additional Primary Module for remote operation	10,476	44	273	194
F2601-01	Secondary Module; for applications requiring 2-by switching capability when up to 4 switchable strings can be configured among independent 2-by switches; may be expanded by one F2600-00	10,476	44	273	194
F2601-03	Secondary Module; same as F2601-01 but for remote operation	10,476	44	273	194
F2602-00	Secondary Module; expands primary module from 2 x 1 to 4 x 1; two maximum	7,127	34	185	133
F2602-01	Secondary Module; same as F2602-00 but for remote operation	7,127	34	185	133
F2603-00	Secondary Module; allows expansion of 4-by switching by one subsystem string; maximum of 3 with each F2602-00; requires F2600-00	586	—	14	11
F2604-00	DC Power Redundancy; adds back-up DC supplies for hot-standby dynamic power redundancy	2,680	13	69	49
3542-97	Additional System Console; attaches to SSP; includes CRT console with keyboard, 200-cps bidirectional printer, and console table; maximum of two 3542-97 or 3542-94 per SSP	28,627	129	714	565
3542-94	Auxiliary Console; same as 3542-97 but without the printer; maximum of two 3542-97 or 3542-94 per processing complex	11,574	70	288	227
F1247-01	Auxiliary Interface; required to interface console printer to 3542-94 console	327	—	11	8
2522-01	Transfer Switch; allows console to be switched between two SSPs	1,575	—	42	32

MEMORY

7049-99	Main Storage Unit Expansion; adds a second MSU with 1024K words of memory to a 3062 (or equivalent) Model E or H processor; may be expanded to 4096K words by adding up to three 2004-99 expansions	232,500	400	5,812	4,695
2004-99	Storage Expansion; adds 1024K words of memory to 3062 processors or to 7049 MSUs	100,000	100	2,500	2,020
7049-98	Memory Upgrade; upgrades a 3042 or 3072 system to an equivalent 3062; expands a uniprocessor (UP) system from 512K words of memory to 1024K words in a separate cabinet; may be further expanded to 4096K words by adding up to three 1024K-word storage expansions. Multiprocessor (MP) systems can have two 7049-98s. Model E or H UP or MP systems can also have a 7049-99 MSU plus expansions for a total of 8192K words. (Not available for Model B1)	182,500	200	4,679	3,685
7049-97	Memory Upgrade; similar to 7049-98, but expansion is from 768K to 1024K words; three 1024K-word expansions can be added. MP systems can have two 7049-97s. Model E and H UP or MP systems can also have a 7049-99 MSU plus expansions	157,500	138	4,038	3,180
7049-96	Memory Upgrade; similar to 7049-98, but expansion is from 1024K to 1024K words in a separate cabinet; three 1024K-word expansions can be added. MP systems can have two 7049-96s. Model E and H UP or MP systems can also have a 7049-99 MSU plus expansions	132,500	100	3,397	2,675
7049-95	Memory Upgrade; upgrades a 3042 or 3072 MP system to an equivalent 3062 MP system; expansion is from 512K words in each processor to 1024K words in a separate cabinet; up to three 1024K-word expansions can be added; can also have a 7049-99 MSU plus expansions	132,500	100	3,397	2,675

*Lease charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	(\$)	(\$)	(\$)
► MEMORY (Continued)					
7049-94	Memory Upgrade; similar to 7049-95, but expansion is from 768K words in each processor to 2048K words in a separate cabinet; two 1024K-word expansions can be added; can also have a 7049-99 MSU plus expansions	182,500	100	4,679	3,685
7049-93	Memory Upgrade; similar to 7049-95, but expansion is from 1024K words in each processor to 2048K words in a separate cabinet; two 1024K-word expansions can be added; can also have a 7049-99 MSU plus expansions	132,500	100	3,397	2,675
MASS STORAGE					
5012-99	FH-432/FH-1782 Drum Control; controls one to eight 6016-00 or 6015-00 drums in any combination	102,720	555	2,247	1,605
F0929-00	Write Lockout Feature for 5012-99 drum control	1,392	5	32	22
F0930-99	Shared Peripheral Interface for 5012-99 drum control; multiprocessor application only	22,608	52	495	355
6016-00	FH-432 Drum; 256K words	52,848	229	1,271	825
6015-00	FH-1782 Drum; 2048K words	146,064	638	3,512	2,280
F0786-01	Dual Channel Feature for 6016-00 drum	3,024	31	72	47
F0767-00	Dual Channel Feature for 6015-00 drum	3,024	35	69	47
5039-91	8433 Control; supports up to eight 8433 (or 8430) disk drives; minimum of two drives per subsystem	27,000	408	1,577	769
F2047-00	Drive Expansion Feature; provides for a maximum of sixteen 8433/8430 drives to be attached to the 5039-91	5,760	56	211	137
8433-00	8433 Disk Drive; removable disk media; minimum of two drives per system	13,680	258	798	389
F1223-00	Disk Pack for the 8433; 154MB	1,820	—	66	43
F2021-00	Dual Access Feature; provides dual access and simultaneous read/read, read/write, write/read, or write/write on any two 8433/8430 drives	1,630	5	59	39
5056-83	8470/8480 Disk Control; provides control for up to eight 8470 disk drives	43,750	258	1,255	930
F2994-00	Four-Channel Capability for 5056-83	6,472	37	270	180
F3192-00	8433 Attachment; allows up to eight 8433 (or 8430) drives on 5056 control unit; up to 3 are allowed	9,840	58	305	226
F3192-02	8470/8480 Attachment; allows up to 8 additional 8470 or two 8480 drives on single control unit; up to 3 are allowed	3,200	21	105	78
F2837-00	Power Control Expansion; required on control unit when over 16 drives are configured	6,575	56	222	144
8470-99	8470 Disk Drive; 403MB of storage	27,360	119	809	599
F2718-00	8470 Dual Access Feature; provides dual access and simultaneous read/write, read/read, write/read, and write/write	1,920	17	57	42
8480-97	8480 Disk Storage Unit; contains 4 spindles with a total capacity of 1.6GB (limited availability)	76,500	475	1,932	1,607
8480-99	8480 Disk Storage Expansion; provides 4 additional spindles; includes dual access feature	83,700	497	2,113	1,761
F2718-02	8480 Dual Access Feature; provides dual access and simultaneous read/write, read/read, write/read, and write/write	7,200	22	181	154
5057-75	8450/8470/8480 Cache/Disk Processor; manages up to four 7053 Cache Storage Units plus up to eight 8450 disk units and up to eight 8470 or two 8480 disk units; connects via word channel	52,960	355	2,207	1,471
5057-77	Disk Control Processor; controls up to eight 8450 disk units and up to eight 8470 or two 8480 disk units; can be upgraded to 5057-75 Cache/Disk Processor	48,125	355	2,005	1,337
5057-87	Solid-State Disk (SSD) Processor; manages up to four 7053 Cache Storage Units used only in solid-state disk mode	41,715	355	1,738	1,159
F3948-97	Processor Upgrade; converts 5057-77 Processor to 5057-75 Cache/Disk Processor	4,835	—	202	134
F4025-98	SSD Upgrade; converts 7057-87 SSD Processor to 5057-75 Cache/Disk Processor	11,245	—	469	312
F3567-00	8450 Capability Expansion; permits sixteen 8450 drives on cache/disk control; precludes attachment of 8470 drives	9,345	55	290	215
F3568-00	8470/8480 Capability Expansion; permits sixteen 8470 drives or four 8480 drives on cache/disk control; precludes 8450 drives	9,345	55	290	215
F2994-00	Four-Channel Capability; expands channel interface capability to 4 word channels; one required per control	6,472	37	270	180
8450-99	8450 Disk Storage Unit; provides 2 disk drives, each with a capacity of 216MB	49,950	346	2,439	1,583
5057-31	8481 Cache/Disk Processor; manages up to four 7053 Cache Storage Units and up to four 8481 disk units; cache and SSD can be intermixed; connects to word channel	52,960	355	2,207	1,471

*Lease charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	Maint.	Lease	Lease
		(\$)	(\$)	(\$)	(\$)
► MASS STORAGE (Continued)					
5057-29	8481 Dual Cache/Disk Processor; same as 5057-31, but provides 2 processors in a single cabinet for dual access control; connects to 2 word channels	105,920	710	4,414	2,942
5057-23	8481 Dual Cache/Disk Processor; same as 5057-29, but connects to 2 block multiplexer channels with FIPS compatibility	105,920	710	4,414	2,942
5057-35	8481 Disk Control Processor; controls up to four 8481 disk units; connects via word channel; can be expanded to 5057-31 Cache/Disk Processor	48,125	355	2,005	1,337
5057-33	8481 Dual Disk Control Processor; same as 5057-35, but includes 2 processors for dual access control; can be expanded to 5057-29 Dual Cache/Disk Processor	96,250	710	4,010	2,674
5057-25	8481 Dual Disk Control Processor; same as 5057-33, but connects via 2 block multiplexer channels with FIPS compatibility; can be expanded to 7057-23 Dual Cache/Disk Processor	96,250	710	4,010	2,674
5057-39	Solid-State Disk (SSD) Processor; manages up to four 7053 Cache Storage Units used only in solid-state disk mode; connects to word channel	41,715	355	1,738	1,159
5057-37	Dual SSD Processor; provides 2 processors in one cabinet for dual access control	83,430	710	3,476	2,318
5057-27	Dual SSD Processor; same as 5057-37, but connects to 2 block multiplexer channels with FIPS compatibility	83,430	710	3,476	2,318
F4025-96	Cache/Disk Capability; converts a 5057-39 SSD Processor to a 5057-31 Cache/Disk Processor	11,245	—	469	312
F4025-95	Cache/Disk Capability; converts a 5057-37 SSD Processor to a 5057-29 Cache/Disk Processor	22,490	—	938	624
F4025-94	Cache/Disk Capability; converts a 5057-27 SSD Processor to a 5057-23 Cache/Disk Processor	22,490	—	938	624
F3948-95	Cache/Disk Capability; upgrades a 5057-35 Disk Control Processor to a 5057-31 Cache/Disk Processor	4,835	—	202	134
F3948-94	Cache/Disk Capability; upgrades a 5057-33 Disk Control Processor to a 5057-29 Cache/Disk Processor	9,670	—	404	268
F3948-93	Cache/Disk Capability; upgrades a 5057-25 Disk Control Processor to a 5057-23 Cache/Disk Processor	9,670	—	404	268
8481-00	8481 Disk Storage Unit; contains 4 spindles with a total capacity of 2.5GB	79,640	235	3,318	2,212
8481-99	8481 Disk Storage Unit; same as 8481-00, except it includes dual access and simultaneous read/write, read/read, write/read, and write/write capability	86,840	235	3,618	2,412
F2718-04	Dual Access Feature; provides dual access capability for 8481-00 disk unit	7,200	—	300	200
7053-97	First Cache Storage Unit; provides 917,504 words of RAM; functions as SSD or cache/disk; requires Segment Descriptor Table for operation in cache/disk mode	72,000	469	2,130	1,600
7053-96	Cache Storage Expansion Unit; provides additional 917,504 words of RAM; up to 3 can be added	72,000	469	2,130	1,600
F3117-02	Segment Descriptor Table; provides 64K words of RAM for cache memory index for 7053	8,200	30	275	250
K3351-00	7053 Memory Expansion; 917,504 words of RAM	36,000	185	1,065	800
F3118-00	7053-97 Dual Access Feature	4,416	16	138	123
F3118-01	7053-96 Dual Access Feature	4,416	16	138	123
5090-99	8490 Dual Solidstate Disk (SSD) Controllers; 2 control units with an 8MB SSD module; can be expanded up to 256MB of SSD storage; requires 7059 uninterruptible power supply (UPS)	166,210	592	6,926	4,617
5090-97	SSD Subsystem; same as 5090-99, except it includes 7059 UPS	194,610	734	8,109	5,405
5090-95	8490 Disk Subsystem; includes two 5090 controllers and 5GB of disk storage; can be expanded to a cache/disk system	296,500	730	12,354	8,236
5090-93	8490 Disk Subsystem; includes two 5090 controllers and 2.5GB of disk storage; can be expanded to 3.75GB or 5GB	224,500	650	9,354	6,236
5090-91	8490 Cache/Disk Subsystem; same as 5090-95, except it also includes cache/disk capability with 8MB of memory	366,500	1,100	15,271	10,180
5090-89	8490 Cache/Disk Subsystem; same as 5090-93, except it also includes cache/disk capability with 8MB of memory	294,500	1,050	12,271	8,180
8490-99	First 5GB Disk Expansion Unit; for 5090-95 or 5090-91; can be used in 5090-93 or 5090-89 if they are first expanded to 5GB	150,000	400	6,250	4,166
8490-97	Disk Expansion Unit; same as 8490-99, except it provides second or third 5GB expansion unit	150,000	400	6,250	4,166
8490-95	First 2.5GB Disk Expansion Unit; for 5090-95 or 5090-91; can be used in 5090-93 or 5090-89 if they are first expanded to 5GB	90,000	310	3,750	2,500
8490-93	Disk Expansion Unit; provides second or third 2.5GB expansion unit	90,000	310	3,750	2,500
F4976-99	Disk Expansion, 2.5GB; for 5090 or 8490 cabinet with only 2.5GB installed	90,000	310	3,750	2,500
F4976-98	Disk Expansion, 1.25GB; for partially populated cabinets	54,000	160	2,250	1,500
F4979-99	Four-Channel Expansion; expands the 4 word channels in a 5090 subsystem to 8 channels	12,945	45	540	360
F4983-99	Disk to Cache Upgrade; provides cache capability to disk-only units; includes 8MB of memory, expandable to 32MB	70,000	400	2,916	1,944

*Lease charges do not include maintenance.
**Field Installation Charge.

Unisys 1100/60

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

► MASS STORAGE (Continued)

F4984-99	SSD Capability; adds SSD to disk-only units; includes 8MB of memory, expandable to 40MB	72,800	280	3,033	2,022
F4983-98	Disk/SSD to Cache Upgrade; converts F4984-99 SSD module, which has been added to a disk-only system, to a cache/disk module	10,000	120	416	277
F4984-98	Second SSD Module; requires F4984-99; can also add SSD capability to a cache/disk subsystem or add a second SSD module to an SSD-only system	72,800	280	3,033	2,022
F4982-99	Memory Expansion, 8MB; for cache or SSD module	60,000	80	2,500	1,666
F4985-99	Data Save Feature; provides 256MB of data save capability for SSD module; requires freestanding UPS	16,710	42	696	464
7059-99	Freestanding Uninterruptible Power System (UPS); provides 15 minutes of power for the dual control units, data save unit, and SSD memory	44,500	142	1,854	1,236
5071-00	Optical Disk Control; provides control for up to 4 optical string controllers in optical disk cabinet	36,000	135	1,500	1,000
F0487-00	Optical Disk Control Expansion; provides second control module, housed in 5071-00 cabinet	26,700	102	1,113	742
F0486-00	Dual Channel Interface for 5071-00	3,960	17	165	110
F0486-01	Dual Channel Interface for F0487-00	3,960	17	165	110
8652-99	Optical Disk Unit; includes optical disk string control, 2.6GB optical disk drive, optical disk cartridge, operator panel, power supply, and space for up to 3 additional optical disk units	50,860	210	2,119	1,413
F0488-00	Optical Disk Drive Expansion; provides additional 2.6GB optical disk drive	25,560	106	1,065	710
F0489-00	String Switch; provides capability to switch data path of 8652-99 string between control modules of 5071-00 and F0487-00; housed in 8652-99	4,680	20	195	130
8654-99	Optical Disk Library; includes optical string control, optical library disk drive, optical disk cartridge, operator panel, power supply, and automatic disk changer for 32 disk cartridges	110,860	390	4,619	3,079
F0488-02	Optical Disk Library Expansion; provides an additional optical library disk drive; maximum of one per 8654	25,560	106	1,065	710
F0489-02	String Switch for Optical Library Unit; provides capability to switch data path of 8654 between control modules of 5071 and F0487; housed in 8654	4,680	20	195	130
F4761-00	Optical Disk Cartridge; 2.6GB	460	—	—	—
5070-97	Shared System; a relational data base system consisting of a processor, a data accelerator, 2MB of main storage, block multiplexer interface, RS-232 interface, disk controller, 8457 disk cabinet with 2 drives, console with printer, and a data base administrator's terminal with printer	250,000	1,200	—	—
F4554-00	Main Storage Expansion, 1MB; maximum of 4	9,000	65	—	—
F4556-01	Block Multiplexer Interface Expansion; provides for attachment of a second 1100 Series or IBM host block multiplexer channel	17,300	60	—	—
F4619-01	RS-232 Interface Expansion; provides for attachment of up to 8 additional RS-232 Sperry Personal Computers (or equivalent) to the Shared System	8,000	60	—	—
F4557-00	Disk Control Expansion; provides additional control for up to four 8457 disk drives; maximum of 3	10,200	65	—	—
F4555-00	Mirrored Disk Support; provides support for data duplication on separate disk drives	12,000	75	—	—
8457-99	Disk Subsystem; includes cabinet with two 344MB disk drives; one included in basic Shared System; up to 3 more cabinets can be added	30,000	190	—	—
F4552-99	8457 Disk Expansion; provides 2 additional 344MB disk drives for 8457-99 cabinet	26,000	190	—	—
8457-98	Disk Subsystem; includes cabinet with four 344MB disk drives; maximum of 4 per Shared System	56,000	380	—	—
8457-97	Disk Subsystem; includes cabinet with two 512MB disk drives; up to 3 more cabinets can be added	34,000	190	—	—
F4814-99	8457 Disk Expansion; provides 2 additional 512MB disk drives	30,000	190	—	—

MAGNETIC TAPE UNITS

5058-00	Uniservo 22 Subsystem; includes 2 Uniservo 22 tape drives and control for up to 8 Uniservo 22 or Uniservo 24 drives	71,040	411	2,235	1,659
5058-02	Uniservo 22 Magnetic Tape Drives; includes 2 dual-density PE/NRZI drives; 1600/800 bpi, 9-track, 75 ips	47,040	267	1,386	1,029
5058-06	Uniservo 24 Subsystem; includes 2 Uniservo 24 tape drives and control for up to 8 Uniservo 24 or Uniservo 22 drives	78,720	455	2,466	1,827
5058-08	Uniservo 24 Magnetic Tape Drives; includes 2 dual-density PE/NRZI drives; 1600/800 bpi, 9-track, 125 ips	54,720	311	1,617	1,197
F0825-00	Dual Channel Feature; provides nonsimultaneous operation on 2 channels of one processor or one channel on each of 2 processors	4,272	34	110	89

*Lease charges do not include maintenance.

**Field Installation Charge.

		<u>Monthly Charges*</u>			
		<u>Purchase</u>	<u>Monthly</u>	<u>1-Year</u>	<u>5-Year</u>
		<u>(\$)</u>	<u>Maint.</u>	<u>Lease</u>	<u>Lease</u>
		<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>
► MAGNETIC TAPE UNITS (Continued)					
F2627-00	Translation Feature; translation is ASCII/EBCDIC, Fieldata/EBCDIC, or Fieldata/ASCII	1,728	15	52	36
F2627-01	Second Translation Feature	1,728	15	52	36
F3820-00	Dual Access Feature	2,016	16	56	44
5055-99	Uniservo 26/28 Control; controls up to 8 Uniservo 26 and 28 tape units; also controls Uniservo 22 and 24 tape units with F2451-00 installed	22,700	140	635	470
F2451-00	Adds 9-track NRZI to 5055-99	3,170	16	82	63
F3738-00	Dual Channel Feature for the 5055-99; provides nonsimultaneous access to the control from 2 block multiplexer channels	1,000	4	34	25
F3739-00	Translation Feature; ASCII to/from EBCDIC	3,600	18	94	72
O884-00	Uniservo 26 Magnetic Tape Unit; dual-density GCR/PE, 6250/1600 bpi, 9-track, 75 ips	22,000	180	595	440
O884-02	Uniservo 28 Magnetic Tape Unit; dual-density GCR/PE, 6250/1600 bpi, 9-track, 125 ips	24,750	190	675	500
F3737-00	Dual Access Feature	900	5	27	20
O876-97	Uniservo 22 Magnetic Tape Unit; attaches to 5055 control unit with F2451-00 installed	19,190	110	525	389
O876-93	Uniservo 24 Magnetic Tape Unit; attaches to 5055 control unit with F2451-00 installed	21,215	121	694	532
5042-00	Uniservo 30 Control for up to 8 9-track, dual-density (GCR/PE) Uniservo 30, 32, 34, or 36 drives	36,214	399	1,290	953
F2131-00	Adds 9-track NRZI to 5042-00; prerequisite for Uniservo 30 drives and all 7-track NRZI features	3,171	26	88	66
F2585-00	Translation Feature for 9-track drives on 5042 control; translation is in both directions involving ASCII/EBCDIC, Fieldata/EBCDIC, and Fieldata/ASCII	1,785	15	49	38
F2585-01	Second 9-track Translator; F2585-00 required	1,785	15	49	38
F2584-99	Adds 7-track NRZI to 5042-00; includes ASCII to BCD translator and data conversion	1,617	13	44	34
F2584-98	Translator is ASCII to fieldata	1,617	13	44	34
F2584-97	Translator is fieldata to BCD	1,617	13	44	34
F2135-00	Dual Channel Feature for the 5042-00; provides nonsimultaneous access to the control from 2 block multiplexer channels; not software supported	4,185	44	138	104
F2137-00	Drive Expansion Feature for the 5042-00; provides for up to 16 Uniservo 30, 32, 34, or 36 drives to be attached to the 5042-00	668	5	23	16
O872-00	Uniservo 30 Magnetic Tape Drives; 9-track, dual-density, PE/NRZI, 1600/800 bpi, 200 ips	27,300	251	903	631
O872-02	Uniservo 30 Magnetic Tape Drive; 7-track, NRZI, 800/556/200 bpi, 200 ips	27,300	251	903	631
F2123-00	Conversion Feature; converts O872-02 to O872-00	3,287	—	91	68
O873-00	Uniservo 32 Magnetic Tape Drive; 9-track, dual-density, GCR/PE, 6250/1600 bpi, 75 ips	24,800	227	839	573
O873-02	Uniservo 34 Magnetic Tape Drive; 9-track, dual-density, GCR/PE, 6250/1600 bpi, 125 ips	28,300	261	962	654
F2125-00	Conversion Feature; converts O873-00 to O873-02	3,675	34	129	85
O874-00	Uniservo 36 Magnetic Tape Drive; 9-track, dual-density, GCR/PE, 6250/1600 bpi, 200 ips	29,500	279	1,031	700
5042-91	Uniservo 36-II Subsystem; includes cabinet with control unit and one Uniservo 36-II tape drive, plus a second cabinet with one tape drive and power supply for both cabinets	81,690	957	3,404	2,269
F4849-00	Dual Channel Feature; provides nonsimultaneous access to the control from 2 block multiplexer channels	4,408	44	187	122
F4847-00	Dual Access 8 Feature; provides dual access capability for up to 8 tape drives; requires 2 control units	5,990	25	250	166
F4848-00	Dual Access 16 Feature; provides dual access capability for up to 16 tape drives; requires 2 control units	5,990	25	250	166
F4850-00	9-Track Translation Feature; translates data from ASCII to EBCDIC and from EBCDIC to ASCII	1,785	15	74	50
O874-22	Uniservo 36-II Magnetic Tape Drive; 9-track, dual-density, GCR/PE, 6250/1600 bpi, 200 ips	25,000	279	1,042	694
5073-99	Uniservo 40 Cartridge Tape Control; controls up to 4 Uniservo 40 Cartridge Tape Units	65,430	360	2,726	1,818
F4855-XX	Channel Attachment; adds second, third, or fourth block multiplexer channel interface	5,785	20	241	161
F4854-00	Dual Access Feature	4,045	—	169	112
O899-99	Uniservo 40 Cartridge Tape Unit; contains 2 tape drives (18-track, 37,871 bytes/inch)	47,108	225	1,963	1,309

*Lease charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

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

► PRINTERS

0770-00	Line Printer and Control; 800 lpm with 48 character set	56,304	372	1,300	1,041
0770-02	1400 lpm	64,896	487	1,498	1,196
0770-04	2000 lpm	86,686	742	3,187	2,074
F1533-00	160 Print Positions for 0770 Series Printers	4,416	26	102	82
F1534-00	Expanded Character Set Control; required for other than 48-character print cartridges	2,880	5	66	53
F2230-00	Printer Upgrade; 0770-00 to 0770-02	8,592	116	198	155
F2230-01	Printer Upgrade; 0770-00 to 0770-04	30,382	249	1,159	559
F2230-02	Printer Upgrade; 0770-02 to 0770-04	21,790	133	961	404
F2822-00	Dynamic Advance Control; reduces slew rate by 50 percent to optimize stacking of light forms	300	—	8	7
F1536-XX	Print Cartridges; a wide variety available	462	—	24	19
F1537-XX	Print Cartridges; a wide variety available	462	—	24	19
0770-06	0770 II Line Printer and Control; 2000 lpm with 48-character set	60,000	685	2,500	1,667
Print Cartridges for 0770 II Printer:					
F4836-00	48-character Alphanumeric Business/Commercial	462	—	—	—
F4836-01	48-character Alphanumeric Scientific	462	—	—	—
F4836-06	48-character OCR-A Alphanumeric	462	—	—	—
F4837-00	94-character ASCII	462	—	—	—
F4837-03	68-character ISO Universal OCR-B	462	—	—	—
F4837-04	68-character OCR H-14 Universal	462	—	—	—
F4837-05	58-character Cobol/Fortran/Business	462	—	—	—
F4837-06	177-character International	462	—	—	—
F4837-11	68-character ISO Universal OCR-A	462	—	—	—
F4837-12	68-character Universal ECMA-11 OCR-B	462	—	—	—
F1537-13	68-character Universal IBM 407	462	—	—	—
F4837-14	63-character Modified Fortran	462	—	—	—
F4837-15	63-character Modified ASCII	462	—	—	—
F4837-19	162-character American Library Association	462	—	—	—
F4837-21	73-character OCR-A	462	—	—	—
F4837-22	63-character Alphanumeric	462	—	—	—
F4837-23	94-character Optimized ASCII	462	—	—	—
F4837-24	63-character Optimized IOS Universal OCR-B (Cartridges are also available for languages other than English)	462	—	—	—
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	Printer 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
F2216-XX	Print Cartridges; a wide variety available	1,270	—	34	26
F2215-XX	Print Cartridges; a wide variety available	1,270	—	34	26
0777-97	On-Line Laser Printer, Model I; up to 21,000 lpm; includes forms splicing station and diskette with 15 character sets (limited availability)	270,000	1,026	—	8,283
0777-87	On-Line Laser Printer, Model II; same as 0777-97 but includes 2 diskettes with 15 character sets each	170,700	942	7,115	4,740
F3380-00/-01	Additional Character Sets; for 0777-97	30	—	—	—
F2874-00	Character Font Expansion; up to 255 characters; for 0777-97	3,640	18	109	82
F3815-00	Character Font Expansion; up to 255 characters; for 0777-87	3,640	18	109	82
F3816-00	Character Font Expansion; up to 1,024 characters; for 0777-87	14,560	84	500	344
F3816-02	Character Font Expansion; up to 3,200 characters; for 0777-87	43,680	254	1,500	1,033
F3816-99	Character Font Upgrade; expands an 0777 printer with 1,024-character font storage to 3,200-character font storage	29,120	170	1,000	689
F3816-98	Character Font Expansion; same as F3816-00, but for field installation only on 0777-97	14,560	84	500	344
F3816-97	Character Font Expansion; same as F3816-02, but for field installation only on 0777-97	43,680	254	1,500	1,033
F3935-XX	Alternate Developer Station; for 0777-97	14,500	26	810	613
F2876-00	Forms Overlay Capability	11,700	34	352	261
F3426-00	Overlay Transparencies	35	—	—	—
1963-00	Burster/Trimmer/Stacker	40,196	181	1,278	900
F3595-00	Forms Counter for 1963-00	1,580	5	40	34
F3598-00	Center Slitter for 1963-00; provides lengthwise separation of forms	900	11	21	18
F3601-00	One-Wide Roll Imprinter; for special printing on forms before bursting; requires 1963-00	1,060	29	25	21
F3601-01	Two-Wide Roll Imprinters; same as F3601-00, but provides two-wide printing	1,520	29	45	38

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**Field Installation Charge.

Unisys 1100/60

		<u>Monthly Charges*</u>			
		<u>Purchase</u>	<u>Monthly</u>	<u>1-Year</u>	<u>5-Year</u>
		<u>(\$)</u>	<u>Maint.</u>	<u>Lease</u>	<u>Lease</u>
		<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>
► PUNCHED CARD EQUIPMENT					
0604-99	Card Punch and Control; 250 cpm	31,968	251	664	536
0716-89	Card Reader and Control; 1000 cpm; comes with code translator; EBCDIC, ASCII, compressed code, or fielddata code	16,545	179	445	322
F1487-00	51-Column Card Read Feature	1,968	17	45	32
F1487-01	66-Column Card Read Feature	1,968	17	45	32
F1488-00	Validity Check	816	—	18	14
F1498-00	Stacker Feature; permits the alternate filling of stackers one and two when in the stop-on-error mode	528	—	12	8
F1486-00	Translate Mode conversion; from EBCDIC to ASCII	105	—	—	—
F1486-01	Compressed Code to ASCII	105	—	—	—
F1486-02	ASCII to EBCDIC	105	—	—	—
F1486-03	Compressed Code to EBCDIC	105	—	—	—
F1486-04	ASCII to Compressed Code	105	—	—	—
F1486-05	EBCDIC to Compressed Code	105	—	—	—
F1486-06	To Fielddata Code	100	—	—	—
F1530-00	Adds a second translator to translate mode under program control	1,104	5	25	18
TERMINALS					
3560-64	UTS 10 Buffered CRT; includes 12-inch screen, RS-232 or current loop interface, expanded keyboard with function keys, program cartridge, and bit serial output peripheral interface	1,720	—	—	—
3660-60	UTS 20 CRT; includes 12-inch screen, 16K RAM, RS-232-C/CCITT V.24 interface, 3270 compatibility, tilt/rotate base, program cartridge, and bit serial output peripheral interface	2,115	31	100	66
3561-80	UTS 40 Programmable CRT; includes 12-inch screen, system RAM, and RS-232-C CCITT V.24 interface	2,333	43	104	69
GENERAL COMMUNICATIONS SUBSYSTEM					
8583-00	General Communications Subsystem (GCS); includes Communications Terminal Controller (CTC); houses maximum of 32 communications terminals with interface or communication terminal dialers	24,000	120	625	500
F1971-00	GCS Expansion; required when 24 or more communications terminals are included in the GCS configuration	1,630	5	57	43
F1972-00	Spare CTC for controlling up to 32 lines in ESI mode on an I/O channel	7,200	48	248	190
F1973-00	Communication Terminal Asynchronous; up to 2400 bps; asynchronous bit serial transmission	1,920	13	50	40
F1973-01	Communication Terminal Asynchronous; same as F1973-00, but with external interrupt capability	2,880	19	101	76
F1973-02	Communication Terminal Asynchronous VII; provides for block parity generation and checking	2,590	19	91	69
F1974-00	Communications Terminal Synchronous; up to 50,000 bps; synchronous bit serial transmission	2,880	17	75	60
F1974-01	Communications Terminal Synchronous; same as F1974-00, but with external interrupt capability	3,410	24	120	90
F1974-02	Communications Terminal Synchronous VII; provides for block parity and checking	3,070	24	108	81
F1975-00	Communications Terminal Synchronous; up to 56,000 bps, bit serial transmission	2,880	23	114	76
F1976-00	High-Level Communications Terminal; bit-oriented transmission to 56,000 bps; conforms to UDLC protocol	3,600	25	127	95
F1977-99	Communication Terminal Dialer	530	3	18	14
F1978-00	Communication Interface—Telegraph	190	1	6	4
F1979-00	Communication Interface—Modem	480	2	13	10
F1979-01	Identical to CI—Modem (1979-00) except permits use of modem not having a receive clock	530	3	18	14
F1980-00	Communication Interface—High-Speed (allows connection of an F1974-00 or F1974-02 to the CCITT V.35 interface)	670	4	23	18
F1980-01	Communication Interface (allows connection of an F1974-00 or F1974-02 to the AT&T 303 modem or equivalent)	670	4	23	18
F1983-00	Spare Basic Clock	190	1	6	4
F1984-00	Expansion Clock (provides asynchronous timing rates not included in the basic clock)	190	1	6	4
F2072-00	Communications Interface (allows connection of an F1974-00 or F1974-02 to a MIL 188C synchronous interface)	530	3	18	14
F2074-00	Communications Interface—automatic inbound bit rate detection	1,100	3	38	30

*Lease charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

		Monthly Charges*			
		Purchase	Monthly	1-Year	5-Year
		(\$)	Maint.	Lease	Lease
			(\$)	(\$)	(\$)
▶ DISTRIBUTED COMMUNICATIONS PROCESSORS					
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	159	623	415
1986-73	DCP/10A; same as 1986-75, except that processor includes 1MB of storage	20,450	229	852	568
1986-71	DCP/10A; same as 1986-75, except it also includes a 10MB rigid disk drive	17,750	210	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	280	939	646
2005-75	DCP/10A; same as 1986-75, except cabinet is not included	13,716	152	587	386
2005-73	DCP/10A; same as 2005-75, except processor has 1MB of storage	19,216	222	816	539
2005-71	DCP/10A; same as 2005-75, except it also includes integrated 10MB rigid disk drive	16,516	203	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	273	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	229	1,458	972
8597-76	DCP/20; same as 8597-78, except processor includes 1MB of storage	42,110	355	1,755	1,170
2024-96	Storage Expansion; expands processor storage from 512KB to 1MB	12,250	126	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	119	656	525
F2894-00	Line Module Expansion; provides 8 additional line modules for 8597-01	12,000	60	460	250
8596-79	Distributed Communications Processor/40 (DCP/40); preconfigured system including 512KB of main storage, 4.6MB rigid disk subsystem, integrated diskette drive, 1100 Series interface, 8-bit peripheral interface, and active line indicators; accommodates up to 11 communications line modules; requires a UTS 20 or UTS 400 console	102,675	584	2,809	2,225
8596-77	DCP/40; same as 8596-79, except it accommodates up to 27 communications line modules and has 14MB disk; includes second I/O processor	119,651	674	3,324	2,629
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	146	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	145	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	77	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	78	399	320
F2941-99	Second IOP Expansion; provides second IOP for 8596-96 or 1945-99; includes power for 2 more IOPs	14,920	81	410	326
F1932-99	Third IOP; mounts in 8596-96 or 1945-99; includes storage port expander	14,185	76	389	310

*Lease charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

		<u>Monthly Charges*</u>			
		<u>Purchase</u>	<u>Monthly</u>	<u>1-Year</u>	<u>5-Year</u>
		<u>(\$)</u>	<u>Maint.</u>	<u>Lease</u>	<u>Lease</u>
		<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>
► DISTRIBUTED COMMUNICATIONS PROCESSORS (Continued)					
F1932-98	Fourth IOP	10,635	57	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 communication 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	23	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 EIS 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 F3556-00 and F3557-00	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 communication 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	39	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 charges do not include maintenance.

**Field Installation Charge.

Unisys 1100/60

		<u>Monthly Charges*</u>			
		<u>Purchase</u>	<u>Monthly</u>	<u>1-Year</u>	<u>5-Year</u>
		<u>(\$)</u>	<u>Maint.</u>	<u>Lease</u>	<u>Lease</u>
		<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>	<u>(\$)</u>
▶ DISTRIBUTED COMMUNICATIONS PROCESSORS (Continued)					
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	2,710	26	112	75
0871-01	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
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	—	—
0425-93	Data Processing Quality Printer for SVT-1121; 160 cps	1,275	38	55	45
0425-92	High Definition Quality Printer for SVT-1121; 160/40 cps	1,395	44	60	50
0472-99	Bidirectional Printer for SVT-1121; 160 cps in data processing mode, 32 cps in near letter quality mode	695	—	—	—
0445-99	Data Processing Quality Printer; 160 cps; connects to DCP/20 or DCP/40	775	17	35	23
0445-97	High Definition Quality Printer; 160/40 cps; connects to DCP/20 or DCP/40	895	20	49	27
F4224-00	Paper Roll for 0445 Printers	45	1	3	2
F4109-00	Forms Tractor	50	1	3	2
F3977-00	Printer Stand for 0445 Printers	230	—	10	8

*Lease charges do not include maintenance.

**Field Installation Charge.

SOFTWARE PRICES

		<u>Single</u>
		<u>Extended</u>
		<u>Term</u>
		<u>Charge*</u>
		<u>(\$)</u>
System Processors		
6163-00	Terminal Security System	11,230
6167-00	Sentry Security Control Processor	37,778
6158-00	Quota Input Processor (QUIP)	11,385
6162-00	Checkpoint/Restart	6,883
6133-00	Data Processor	3,260
6203-00	Fault Location of Interpretive Testing (FLIT)	6,003
Language Processors		
6165-00	General Syntax Analyzer	4,950
6172-00	APL 1100	26,341
6171-00	UBasic	6,521
6178-00	UBasic Syntax Analyzer	3,260
6153-00	ASCII Cobol	15,525

*License for a 5-year period.

**Monthly charge.

Unisys 1100/60

**Single
Extended
Term
Charge***
(\$)

► Language Processors (Continued)

6149-00	Cobol Syntax Analyzer (BCOB)	6,521
6154-00	ASCII Fortran	22,770
6150-00	Fortran Syntax Analyzer (BFTN)	6,521
6151-00	PL/1	13,041
6164-00	RPG 1100	6,521
6243-99	RPG II Group	6,728
6160-00	MACRO	6,521

Data Base Management & Data Management

6292-00	Universal Data System (UDS) 1100 Control	10,350
6700-00	UDS Data Management System (DMS) 1100	54,338
6298-00	UDS Query Language Processor (QLP) 1100	21,994
6298-99	UDS QLP with PCIOS Interface	25,616
6293-00	UDS Relational Data Management System (RDMS) 1100	38,813
6299-00	UDS Data Dictionary System	25,875
6177-00	Define File Processor	3,260
6175-00	Integrated Recovery Utility (IRU)	22,201
6175-01	IRU Version II	23,184
6175-02	IRU Version III	26,082
6291-00	File Administration System (FAS)	7,763
6155-00	Data Management System (DMS) 1100	56,925
6176-00	Data Dictionary	19,820
6152-00	Processor Common Input/Output System (PCIOS)	3,881
6244-00	Information Management System (IMS) 1100	10,091
6157-00	Query Language Processor (QLP) 1100	21,994
6156-00	Remote Processing System (RPS) 1100	13,041

Data Communications

6169-95	Communications Management System (CMS)	14,231
6169-97	CMS 1100 DCP/40	28,463
6159-00	Processor Common Communications System (PCCS)	6,521
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
6276-00	BSC 3270 Terminal Handler	6,750

Program Development

6146-00	Mapper 1100	62,100
8824-00	Mapper Kit Tools	15,000
6290-00	Advanced Information Service (Advise) 1100	15,525
6239-00	Programmers Advanced Debugging System (PADS) 1100	11,385
6170-01	Conversational Time-Sharing System (CTS) 1100	18,113
6147-00	High-Volume Time-Sharing (HVTS)	32,861
6262-00	Interactive Processing Facility (IPF) Command Language	14,231
6260-00	IPF Control	5,170
6263-00	IPF Procedures	18,113
6245-98	Edit 1100	15,008
6264-00	User Assistance	3,881
6261-00	Distributed Data Processing (DDP) 1100	5,175
7623-01	SX 1100; 16 users	12,000
7623-02	SX 1100; 32 users	18,000
7623-03	SX 1100; 64 users	27,000
7623-04	SX 1100; 128 users	39,000

Utilities

6271-00	CULL Processor	1,294
F3859-00	Interactive CULL (IACULL)	1,294
6135-00	Sort/Merge	7,763
6246-00	Log Analyzer	6,210
6161-00	Performance Analysis Routines	15,008
6274-00	On-line System Activity Monitor (OSAM)	7,763

Miscellaneous Products

6237-00	Display Processing System (DPS) 1100	18,113
F3791-00	Univac Printer Interface Software (UPRINTS); provides interface to 0777 Printer	10,350
6753-00	Percon Control; provides support for peripheral devices such as printers	2,588

*License for a 5-year period.

**Monthly charge.

Unisys 1100/60

		Single Extended Term Charge* (\$)
► Miscellaneous Products (Continued)		
F6110-00	Percon 0777; provides support for 0777 laser printer; requires 6753-99	4,050
F6115-00	Percon 0770 and 0776; provides support for 0770 and 0776 printers as an alternative to standard device handlers; requires 6753-99	3,364
F3793-00	Cache Disk Interface Software (CADIS)	20,700
7666-00	Shared System Control	60,000
8759-00	Optical Disk Support System; provides the capability to store data or retrieve data from the 5071 Optical Disk Subsystem	10,800
8760-00	Optical Disk Direct Read Package; includes all the capabilities of 8759-00, plus a callable subroutine that provides for direct/random reads within the previously written portion of an optical disk cartridge	13,800
Local Support Services		
6173-62	1100/61 Model B1	**400
6173-91/90	1100/61 Models C1 and C2	**580
6173-68/67	1100/61 Models E1 and E2	**800
6173-89/88	1100/61 Models H1 and H2	**925
6173-72/71	1100/62 Models E1 and E2	**1,155
6173-87/86	1100/62 Models H1 and H2	**1,300
6173-66/65	1100/63 Models H1 and H2	**1,500
6173-64/63	1100/64 Models H1 and H2	**1,620
*License for a 5-year period.		
**Monthly charge. ■		