UNIVAC 90/60 and 90/70

► the Nucleus, Sequential Access, and Table Handling modules, and Level 1 of the Random Access, Sort, and Segmentation modules.

The OS/7 COBOL compiler conforms to DOD Level 4 requirements. It includes the ANS Level 2 Nucleus, Sequential Access, Sort, Segmentation, and Library modules, and a Level 3 implementation of the Table Handling module. The Report Writer Feature has not been included. Memory requirement for OS/7 COBOL is 48K bytes on a minimum 131K-byte system.

FORTRAN: An OS/4 FORTRAN compiler is available for operation on the minimum 131K UNIVAC 90/60 or 90/70 system. It includes all the language facilities of full American National Standard FORTRAN, and is 360 FORTRAN F compatible. In addition, there are more than 20 useful language extensions, such as direct-access I/O statements and the ability to handle arrays of up to 7 dimensions.

FORTRAN: An OS/4 FORTRAN compiler is available for operation on the minimum 65K UNIVAC 9700 system. It includes all the language facilities of full American National Standard FORTRAN, and is 360 FORTRAN F compatible. In addition, there are more than 20 useful language extensions, such as direct-access I/O statements and the ability to handle arrays of up to 7 dimensions.

The OS/7 FORTRAN Compiler offers extended capabilities over those of the OS/4 compiler, plus source-code compatibility with IBM System/360 Level G FORTRAN except for the DUMP and PDUMP Statements. OS/7 FORTRAN requires about 40K bytes of main memory.

ASSEMBLER: The OS/4 Assembler permits programs to be coded in a symbolic assembly language that is very similar to, though not totally compatible with, the Assembler languages for the UNIVAC 9200/9200 systems and the IBM System/360. It is directly compatible with the UNIVAC 9400 BAL.

The OS/7 Assembler includes all of the nonprivileged instructions of the IBM System/360 Model 50. Programs written for the UNIVAC 9400 or IBM System/360 Assembler can be assembled using the OS/7 Assembler without change. Memory requirement for the OS/7 Assembler is 40K bytes. The Assembler produces relocatable object modules which can be written on either disc or tape. These object modules can be linked to other modules prior to being loaded and executed. A macro-instruction facility simplifies the inclusion of precoded subprograms.

REPORT PROGRAM GENERATOR: The OS/4 RPG is designed to accept UNIVAC 9200/9300/9400 RPG source programs for generation and execution of a 90/60 or 90/70. It is available for the minimum UNIVAC 90/60 or 90/70 with 131K bytes of main storage. The generated RPG object programs can be recorded on tape, disc, or punched cards to eliminate the need for re-generation of the program before subsequent report runs. The object programs are relocatable modules that can be linked to other programs and stored in disc or tape libraries.

OS/7 RPG offers the same capabilities as the OS/4 version, plus source-code compatibility with IBM System /360 DOS RPG. Memory requirement for OS/7 RPG is 20K bytes.

INFORMATION MANAGEMENT SYSTEM (IMS/90): Provides OS/7 users with an on-line information storage and retrieval capability utilizing the Message Control program and the Data Management handlers for standard file access methods. After initiating a dialog with IMS/90, passwords are used to control access to restricted information. A free-form query/update language, supported by either CRT or hardcopy terminal devices, permits users to retrieve and display information from files, generate and display lists of qualified data, and add, delete, or change files. The defined record management capabilities permit a new record to be

created from selected portions of multiple files. IMS/90 also facilitates applications programming by providing communications interfacing, application program scheduling, data management, system security, and recovery of files and messages. Main memory requirement for IMS/90 is about 40K bytes, which includes the user-terminal language processor called UNIQUE.

DATA MANAGEMENT SYSTEM/90 (DMS/90): DMS/90 is UNIVAC's newly announced data base management system for large Series 90 installations operating under OS/7. Like DMS-1100 for the UNIVAC 1100 Series computers, DMS/90 is a comprehensive data base management system developed according to the specifications of the 1971 Report of the CODASYL Data Base Task Group. Its functional capabilities, therefore, are similar to those provided by DMS-1100, although there is no compatibility between the two systems on the machine level.

DMS/90 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, and (3) data base protection and integrity. DMS/90 has three principal components: a Data Description Language, a Data Manipulation Language, and a Data Management Routine.

The Data Description Language (DDL) is a stand-alone language whose record descriptions are compatible with those of COBOL. The DDL input provided by the data manager completely defines the data base. The data base description, or "schema", is composed of areas, records, and sets. A DDL Translator converts the DDL syntax into a series of tables which are maintained in a catalogued file in mass storage for later interpretation by the Data Management Routine.

The concept of "areas" in DDL provides the means for associating the data base with the physical mass storage devices in which it resides. A "set" is simply a named collection of records. The records in a set can be ordered through keys (DIRECT), based on values (CALCULATED), or based on owner occurrence (VIA). A given record can be both an "owner record" of, and a "member record" in, one or more sets, and a different ordering procedure can be used in each set.

The application programmer can only access a data base through a "subschema" which has to be provided for him by the data base administration staff. The subschema is made available to a program by an INVOKE declarative statement. Since the programmer cannot touch any data not invoked as a subschema, data privacy and integrity are assured, at least at the application program level.

The imperative data manipulation statements for control, retrieval, and modification, and the INVOKE declarative, are referred to collectively as the Data Manipulation Language (DML). It is the procedural language used by individual programmers to access the data base. It is used in connection with a host language – usually COBOL – which describes the procedures for processing the data once it has been accessed. The functions of DML can be generally described by listing its commands: OPEN, CLOSE, FIND, GET, MODIFY, STORE, DELETE, INSERT, REMOVE, IF, ON-ERROR, PRIVACY, LOG, and DEPART. The programmer inserts the appropriate DML commands into the syntax of his COBOL source program. A DML Preprocessor then converts the DML commands into a COBOL-compatible format and adds the necessary record descriptions and communication areas. The altered syntax is passed on to the COBOL compiler, which produces an executable program called a "run unit."

The Data Management Routine (DMR), the key operational component of DMS/90, maintains the data base and preserves its integrity. No run unit is allowed direct access to the data base; instead, all DML commands are funneled through the Data Management Routine. In addition to its storage and retrieval functions, DMR includes save data, ►

rollback, and recovery routines that prevent loss of data through hardware failures, software bugs, or erroneous input.

DMS/90 can be used with any host language that supports a CALL macro or its equivalent. Since the DML processor is available only for ANS COBOL, user communication with DMS/90 from other host languages is through arguments passed via CALL statements. The DMS routines are not re-entrant and require approximately 50K bytes of main memory at execution time.

UTILITY ROUTINES: An OS/4 or OS/7 Sort/Merge program capable of using disc and/or tape drives is available. It can sort fixed or variable-length records into either ascending or descending sequence, and includes provisions for the user's own coding. Disc-only sorts require enough disc capacity to hold all the records to be sorted plus sort control information. Tape-only sorts require 3 to 14 tape units, with no more than 6 tapes used for string collating. Tape/disc sorts use the disc to increase the length of the strings before collation is done on tape. The program's operation can be controlled by parameters entered either when the sort is generated or at run time. Up to 255 noncontiguous key fields can be specified, using shared input devices, if desired, and reserved output devices. The COBOL SORT verb generates a linkage to the Sort/Merge utility program.

A Linkage Editor combines object modules produced by the COBOL, FORTRAN, RPG, or Assembly language translators into "load modules" which are suitable for loading and execution under operating system control.

Library Service routines facilitate the creation and maintenance of various types of libraries on tape and disc for OS/4 or OS/7.

Other available utility programs for either the OS/4 or OS/7 operating system include data transcription routines, comprehensive data utilities to copy data from any input device to any output device, file maintenance routines, a dynamic (snapshot) dump, a terminal (postmortem) dump, and tape and disc listing programs.

For use under OS/4, UNIVAC offers a simulator for the UNIVAC 1050 and translators for IBM 1400 Series Autocoder and SPS and for IBM System/360 BAL.

Under OS/7, the IBM System/360 Assembler language is fully compatible with the UNIVAC 90/60 and 90/70 Assembler. IBM System/360 DOS and IBM 1401, 1440, and 1460 compatibility is handled through microprogrammed integrated emulation for certain time-consuming operations and supported by software subroutines for other emulated operations. More than one object program for a System/360 DOS system or a 1401, 1440, or 1460 can be run concurrently with other OS/7 operations without reprogramming, using the IBM disc, tape, and unit record files. UNIVAC claims a 90/70 emulation performance of 5.0 times native 1401 performance and 2.5 times native 1460 performance. These estimates are roughly similar to those claimed for the IBM System/360 Model 40 and System/370 Model 145. Performance estimates for the 90/60, and for both the 90/60 and 90/70 emulating an IBM System/360 DOS environment, are not yet available. UNIVAC 90/60 and 90/70 software support required in conjunction with the special hardware compatibility features and microcode occupies from 45K to 60K bytes of main memory.

The Series 70 Mode of Operation Through Hardware (SMOOTH) runs under OS/7 on the 90/60 and 90/70 and supports TOS, TDOS, and DOS batch operations, while communications programs can be run under a version of COS that is fully incorporated into OS/7.

APPLICATION PROGRAMS: Programs announced to date include an advanced Pert Management Control System

(MCS), Linear Programming, UNIS (bill of materials, inventory control, planning and scheduling), APT (automatically programmed tools), PROFITS (on-line bank teller transaction processing), LINCO III (typesetting and line justification), NEWSCOMP (on-line newspaper text editing and typesetting), WIMS (Wholesale Inventory Management System), UPACS (UNIVAC Patient Accounting System – a hospital accounting package), CLEAR II (County Law Enforcement Applied Regionally – an on-line data base management system for state and local government), and BMD (Biomedical Programs – a collection of general-purpose statistical and mathematical programs for research and management problems). The 90/60's and 90/70's announced compatibility with IBM System/360 DOS user programs will permit the use of most of the existing System/360 application programs.

PRICING

EQUIPMENT: All necessary control units and adapters are included in the indicated prices for the following typical configurations, and the quoted one-year rental prices include equipment maintenance.

The price increases announced by Sperry UNIVAC in October 1974 are fully reflected in the following configuration prices and price list.

UNIVAC 90/60 SMALL TAPE/DISC SYSTEM (USING OS/4): Consists of 131K Processor (with standard selector, multiplexer, floating-point hardware, and storage protection feature), Console, 600-cpm Card Reader, 250-cpm Card Punch, 800-lpm Printer, two Uniservo 12 (68KB) Tape Units with control, and two 8414 disc drives (29 million bytes each) with control. Monthly rental and purchase prices are $13,872 and $580,762, respectively. The five-year lease cost would be $12,057 per month.

UNIVAC 90/60 SMALL TAPE/DISC SYSTEM (USING OS/7): Consists of a 196K Processor (with standard selector, multiplexer, floating-point hardware, and storage protection feature), Console 600-cpm Card Reader, 250-cpm Card Punch, 800-lpm Printer, two Uniservo 12 (68KB) Tape Units with control, and two 8414 disc drives (29 million bytes each) with control. Monthly rental and purchas prices are $15,666 and $645,848, respectively. The five-year lease cost would be $13,651 per month.

UNIVAC 90/60 MEDIUM TAPE/DISC SYSTEM (USING OS/7): Consists of 262K Processor (with two selectors, one multiplexer, storage protection, floating-point hardware, and emulation features), Console, 600-cpm Card Reader, 1400-lpm Printer, four Uniservo 12 (68KB) Tape Units and control, and two 8430 Disc Drives (100 million bytes each) with control. Monthly rental and purchase prices are $18,368 and $741,370, respectively. The five-year lease cost would be $16,015.

UNIVAC 90/60 LARGE TAPE/DISC SYSTEM (USING OS/7): Consists of a 393K Processor (with two selectors, one multiplexer, storage protection, floating-point hardware, and emulation features), Console, two 2000-lpm Printers, two 1000-cpm Card Readers, 250-cpm Card Punch, six Uniservo 16 (192KB) Tape Units and control, and four 8430 Disc Drives (100 million bytes each) with control. Monthly rental and purchase prices are $28,203 and $1,115,916, respectively. The five-year lease cost would be $24,640.

UNIVAC 90/70 SMALL TAPE/DISC SYSTEM (USING OS/4): Consists of 131K Processor (with standard selector, multiplexer, floating-point hardware, and storage protection feature), Console, 600-cpm Card Reader, 250-cpm Card Punch, 800-lpm Printer, two Uniservo 12 (68KB) Tape Units with control, and two 8424 Disc Drives (58 million bytes each) with control. Monthly rental and purchase prices are $19,970 and $832,330, respectively. The five-year lease cost would be $17,369 per month. ►

UNIVAC 90/60 and 90/70

► UNIVAC 90/70 SMALL TAPE/DISC SYSTEM (USING OS/7); Consists of 196K Processor (with standard selector, multiplexer, storage protection, floating-point hardware, and emulation features), Console, 600-cpm Card Reader, 250-cpm Card Punch, 1400-lpm Printer, two Uniservo 12 (68KB) Tape Units with control, and two 8424 Disc Drives (58 million bytes each) with control. Monthly rental and purchase prices are $20,084 and $835,978, respectively. The five-year lease cost would be $17,475 per month.

UNIVAC 90/70 MEDIUM TAPE/DISC SYSTEM (USING OS/7): Consists of 393K Processor (with two selectors, one multiplexer, storage protection, floating-point hardware and emulation features). Console 600-cpm Card Reader, 250-cpm Card Punch, 1200/1600-lpm Printer, four Uniservo 12 (68KB) Tape Units with control, and four 8430 Disc Drives (100 million bytes each) with control. Monthly rental and purchase prices are $22,649 and $935,482, respectively. Monthly rental on the 5-7 year plan would be $19,701.

UNIVAC 90/70 LARGE TAPE/DISC SYSTEM (USING OS/7): Consists of 655K Processor (with four selectors, one multiplexer, storage protection, floating-point hardware, emulation, and two OSSF memory devices), Console, two 1000-cpm Card Readers, two 1400-lpm Printers, a 250-cpm Card Punch, eight Uniservo 20 (320KB) dual-access tape units with two controllers, and eight 8430 Disc Drives (100 million bytes each) with control. Monthly rental and purchase prices are $48,014

and $1,960,948, respectively. The monthly cost under a five-year lease would be $41,874.

SOFTWARE AND SUPPORT: UNIVAC has not "unbundled" to date, so the equipment prices listed above include all of the UNIVAC software described in this report and all normal educational courses and professional assistance. UNIVAC Customer Support Facilities will provide conversion support, demonstrations, and benchmark processing for UNIVAC 90/60 and 90/70 customers and prospects. This support, also, is included without additional charge.

CONTRACT TERMS: The standard UNIVAC 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, Monday through Friday. Extended periods of maintenance are available at extra cost.

LONG-TERM LEASES: In addition to the basic 1-year agreement, UNIVAC offers an extended-term 5-year lease for 90/60 and 90/70 systems at significantly lower monthly rates. Under the 5-year "level-payment" agreement, the monthly equipment charge is 85% of the 1-year rental rate shown in the accompanying price list. Under a 5-year "reducing-payment" agreement, the monthly charge is 95% of the 1-year rental rate during the first year, 90% the second year, 85% the third year, 80% the fourth year, and 75% the fifth year. Maintenance is not discounted under these plans. ■

EQUIPMENT PRICES

		Purchase Price	Monthly Maintenance	Rental (1-year lease)*
90/60 PROCESSOR AND MAIN STORAGE				
3024-97	90/60 Processor (includes a Multiplexer Channel, 2 Interval Timers, Storage Protection, a Selector Channel, Floating Point Control, and 131,072-byte Memory)	319,248	678	6,651
7025-85	Storage; 32,768 bytes (expands main storage from 131,072 to 163,840 bytes)	17,640	66	357
F1775-97	Storage; 32,768 bytes (expands main storage from 163,840 bytes to 196,608 bytes, from 196,608 bytes to 229,376 bytes, or from 229,376 bytes to 262,144 bytes)	17,640	66	357
7025-84	Storage; 65,536 bytes (expands main storage from 262,144 bytes to 327,680 bytes)	32,760	105	663
F1775-96	Storage; 65,536 bytes (expands main storage from 327,680 to 393,216 bytes)	32,760	105	663
7025-97	Storage; 131,072 bytes (expands main storage from 393,216 bytes to 524,288 bytes)	65,520	210	1,326
F2007-00	90/70 upgrade; converts a 90/60 Processor to a 90/70 Processor	195,024	418	4,063
90/70 PROCESSOR AND MAIN STORAGE				
3024-99	90/70 Processor (includes a Multiplexer Channel, 2 Interval Timers, Storage Protection, a Selector Channel, Floating Point Control, and 131,072-byte Memory)	514,272	1,096	10,714
7025-99	Storage; 65,536 bytes (expands main storage from 131,072 to 196,608 bytes)	35,280	131	714
F1775-98	Storage; 65,536 bytes (expands main storage from 196,608 to 262,144 bytes)	35,280	131	714
7025-98	Storage; 131,072 bytes (expands main storage from 262,144 to 393,216 bytes)	65,520	210	1,326
7025-97	Storage; 131,072 bytes (expands main storage from 393,216 to 524,288 bytes)	65,520	210	1,326
7025-96	Storage; 131,072 bytes (expands main storage from 524,288 to 655,360 bytes)	65,520	210	1,326
7025-95	Storage; 131,072 bytes (expands main storage from 655,360 to 786,432 bytes)	65,520	210	1,326
7025-94	Storage; 131,072 bytes (expands main storage from 786,432 to 917,504 bytes)	65,520	210	1,326
7025-93	Storage; 131,072 bytes (expands main storage from 917,504 to 1,048,576 bytes)	65,520	210	1,326

*Rental prices do not include equipment maintenance.

UNIVAC 90/60 and 90/70
EQUIPMENT PRICES

90/60 AND 90/70 PROCESSOR FEATURES		Purchase Price	Monthly Maintenance	Rental (1-year lease)*
F1519-00	Expanded interface; expands multiplexer to 15 subsystems (16 if F1518-00 is present). Available on 90/70 Processor only.	7,152	18	149
F1518-00	Subchannel Expansion; expands multiplexer up to 31 subchannels	2,400	6	50
F1337-00	Selector Channel; 833KB; 8 subsystems (includes channel programming and storage protection; Selector Channels 3 and 4 require 1916-00 Channel Expansion Cabinet)	11,664	29	243
1916-00	Channel Expansion Cabinet (for third and fourth F1337-00 Selector Channels)	11,424	29	238
F1335-00	Direct Control; interface for another 9000 Series processor plus 2 instructions for transfer of control information	4,752	11	99
F1591-00	Programmable Emulator; provides programmable control for any one of the following emulators using special hardware instructions: 301, SMOOTH, 360, or 1400	0	0	0
F1591-01	Programmable Emulator Expansion; provides programmable control for concurrent operation of two emulators (F1591-00 is required)	13,200	60	275
4014-99	System Console; includes Uniscope 100 CRT; may be expanded by addition of one 0772-00 Printer and up to 6 multichannel switches	27,024	84	563
0772-00	Console Printer; 30 cps (required for OS/4)	13,200	54	275
2519-00	Multiple Channel Switch; 1 switch plus cabinetry for five F1541-00 expansion switches	9,024	24	188
F1541-00	MCS Expansion; one switch	4,464	11	93
F1001-00	Channel Adapter 9000 Series Subsystem; provides 900 Series subsystem interface through respective multiplexer or selector channels	4,464	17	93

MASS STORAGE

8405-99	OSSF; includes controller for 4 OSSF disc drives and one 3-million-byte head-per-track disc; 8.34-millisecond rotational delay	102,816	263	2,142
8405-04	OSSF Expansion; one 3-million-byte head-per-track disc; 8.34-millisecond rotational delay	31,824	105	663
8411-00	Disc Drive; 7.25 million bytes; 156KB/sec transfer rate	21,552	89	449
F1211-00	Disc Pack (for 8411 Disc Drives)	347	0	17
5024-00	Disc File Control (for up to 8 8411 drives)	23,904	95	498
F1043-00	Dual Channel Feature (for 5024-00); permits simultaneous access to the control from 2 selector channels	4,416	17	92
F1098-00	Record Overflow Feature (for 5024-00)	528	0	11
F1099-00	File Scan Feature (for 5024-00)	1,872	0	39
8414-92	Two 8414 Disc Drives; 58 million bytes; 312 KB/sec transfer rate	42,528	144	886
8414-94	Four 8414 Disc Drives; 116 million bytes; 312 KB/sec transfer rate	79,920	290	1,665
8414-96	Six 8414 Disc Drives; 174 million bytes; 312 KB/sec transfer rate	112,128	435	2,336
8414-98	Eight 8414 Disc Drives; 232 million bytes; 312 KB/sec transfer rate	139,104	579	2,898
8414-85	Single 8414 Disc Drives (for configuration expansion); 29 million bytes; 312 KB/sec transfer rate	21,264	73	443
F1214-00	Disc Pack (for 8414 Disc Drives)	382	0	22
5024-02	Disc Control (for up to eight 8414 drives)	28,560	101	595
F1043-00	Dual Channel Feature (for 5024-02); permits access to the control from 2 selector channels	4,416	17	92
1371-99	Dual Access Feature (for 5024-02); permits simultaneous 2-channel access when used with 2 Disc Controls	2,352	5	49
1343-02	8411 Disc Capability (for 5024-02); allows attachment of 8411 drives to 5024 control in any combination with 8414 drives	2,064	11	43
5024-99	8424 Controller (for up to four 8424's)	57,072	326	1,189
8424-00	8424 Disc Storage (dual drive; 58 million bytes per drive)	35,280	179	935
F1771-01	Dual Access (per 8424-00 unit)	4,536	10	92
F1043-00	Dual Channel	4,416	17	92
F1214-01	Disc Pack (for 8424 drives)	433	—	21
5039-00	Control Unit; controls up to eight Model 8430 Disk Storage Drives	44,064	300	1,200
8430-00	Disk Storage Drive; provides a single disk drive	24,960	130	520
F2020-00	Dual Access; provides dual access and simultaneous read and write operations on any two disk drives; required on both disk drives in the subsystem; also requires two Model 5039 Control Units and two selector channels	2,160	5	45
F2046-00	Dual Channel; provides non-simultaneous access to one Model 5039 Control Unit from two selector channels	4,080	15	85
F2047-00	16-Drive Expansion; provides the capability to attach up to 16 Model 8430 Disk Drives to one Model 5039 Control Unit	7,680	40	160
F1230-00	Disk Pack; provides up to 100 million bytes of removable storage (maintenance contract is not available)	750	—	40

*Rental prices do not include equipment maintenance.

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UNIVAC 90/60 and 90/70
EQUIPMENT PRICES

INPUT/OUTPUT UNITS

		Purchase Price	Monthly Maintenance	Rental (1-year lease)*
0861-00	Uniservo 12 Master Tape Unit; 9-track; 1600 bpi, 68.32 KB/second	18,336	120	382
F0934-99	Simultaneous Single-Density Feature (for 0861-00); requires 2 controls	4,080	18	85
F0934-01	Simultaneous Dual-Density Bi-Modal Feature (for 0861-00); requires F0934-99 and F0935-00 to give simultaneous access to dual density bi-modal (7- or 9-track) slaves attached to same master unit; control units each require F0826-00 and F1028-95)	4,608	18	96
F0935-00	Dual Density Bi-Modal Feature (for 0861-00); control must have F0823-99; if 7-track slaves are present, control must also have F1028-95	2,688	11	56
0861-01	Uniservo 12 Slave Tape Unit; 9-track; 1600 bpi, 68.32 KB/second (3 slaves may be used with 1 master unit)	14,688	83	306
0861-04	Uniservo 12 Master Tape Unit; 7-track; 200, 556 or 800 bpi; 8.54, 23.74, or 34.16 KB/second	16,936	120	332
F0934-98	Simultaneous Single-Density Feature (for 0861-04); requires 2 control units which each must contain F0823-99	4,080	18	85
F1041-00	7- to 9-Track Conversion Feature (for 0861-04); converts to 0861-00	2,448	0	51
F1041-01	Simultaneous 7- to 9-Track Conversion Feature (for 0861-04 with F0934-98); converts to 0861-00 with F0934-99	2,448	0	51
0861-05	Uniservo 12 Slave Tape Unit; 7-track; 200, 556, or 800 bpi; 8.54, 23.74, or 34.16 KB/second (3 slaves may be used with 1 master unit)	13,056	83	272
F1042-00	7- to 9-Track Conversion Feature (for 0861-05); converts to 0861-01	1,632	0	34
5017-99	Uniservo 12 Non-Simultaneous Control (for up to 16 Uniservo 12 drives); 9-track; 1600 bpi	26,448	101	551
5017-00	Uniservo 12/16 Non-Simultaneous Control (for up to 16 Uniservo 12 and/or 16 drives); 9-track; 1600 bpi	28,560	111	595
F1131-99	Uniservo 16 Capability (for 5017-99)	2,112	11	44
F1029-99	Simultaneous Single-Density Access (for 5017-99); provides second control module	16,896	67	352
F1029-00	Simultaneous Single-Density Access (for 5017-00); provides second control module	18,960	78	395
F0823-99	7-Track NRZI (for 5017-00 or 5017-99)	5,760	17	120
F0826-00	9-Track NRZI (for 5017-00 or 5017-99)	4,416	17	92
F1028-95	BI-Modal (7- or 9-Track) NRZI (for 5017-00 or 5017-99 with F0826-00)	4,176	11	87
F1028-96	Bi-Modal (7- or 9-Track) NRZI (for 1017-00 or 5017-99 with F0823-99)	4,176	11	87
F0825-00	Non-Simultaneous Dual Channel Feature (for 5017-00 or 5017-99)	4,416	17	92
0862-00	Uniservo 16 Magnetic Tape Unit; 9-track 1600 bpi; 192 KB/second (requires 5034-00 control)	19,609	116	459
0862-02	Uniservo 16 Magnetic Tape Unit; 7-track; 200, 556, or 800 bpi; 24, 66.72, or 96 KB/second (requires 5034-00 or 5017-00 control)	22,032	116	459
F0936-99	Simultaneous Feature (for 0862-00 or 0862-02); requires 2 controls	914	0	21
F0937-00	Dual-Density Feature (for 0862-00); control(s) must contain F0826-00 or F1028-96	2,284	0	51
F1040-00	7- to 9-Track Non-Simultaneous Conversion Feature (for 0862-02); converts to 0862-00	0	0	0
F1040-01	7- to 9-Track Simultaneous Conversion Feature (for 0862-02 with F0936-99); converts to 0862-00 with F0936-99	0	0	0
0864-00	Uniservo 20 Magnetic Tape Unit; 9-track; 1600 bpi, 320 KB/second	27,696	132	577
F1510-00	Dual Access and Simultaneous Feature (for 0864-00); requires 2 controls	2,448	10	51
5034-00	Uniservo 20 Non-Simultaneous Control (for up to 16 9-track; 1600 bpi (requires 2 controls for dual access)	36,720	95	765
F0823-98	7-Track NRZI (for 5034-00); adds bi-modal 7- or 9-track capability to control; may not be used with F0826-99	5,544	16	113
F0826-99	9-Track NRZI (for 5034-00); adds dual-density 800 or 1600 bpi to control; may not be used with F0823-98	6,552	21	133
F1028-97	Bi-Modal (7- or 9-track) NRZI (for 5034-00 with F0826-99)	4,536	10	92
F1028-98	Bi-Modal (7- or 9-track) NRZI (for 5034-00 with F0823-98)	5,544	16	113
0604-99	Card Punch and Control; 250 cpm	22,234	107	463
F0875-00	Read/Punch Feature (for 0604-99)	7,152	56	149
0716-95	Card Reader and Control; 600 cpm	12,192	61	254
0716-99	Card Reader and Control; 1000 cpm	15,504	101	323
F1487-00	Short Card Feature; 51 columns	1,968	11	41
F1487-01	Short Card Feature; 66 columns	1,968	11	41
F1488-00	Validity Check Feature	816	0	17
F1498-00	Alternate Stacker Fill Feature	528	0	11
F1530-99	Dual Translate; additional ASCII translator	1,104	5	23
0770-00	Printer, 800 lines per minute	56,304	234	1,173
0770-02	Printer, 1400 lines per minute	64,896	306	1,352
0770-04	Printer, 2000 lines per minute	86,686	390	1,806
F1533-00	160 Print Positions	4,416	17	92
F1534-00	Expanded Character Set Control (required for other than 1536-00 or -01 Print Cartridges)	2,880	5	60

*Rental prices do not include equipment maintenance.

UNIVAC 90/60 and 90/70
EQUIPMENT PRICES

		Purchase Price	Monthly Maintenance	Rental (1-year lease)*
INPUT/OUTPUT UNITS (Continued)				
F1536-00	48-character alphanumeric Business	462	—	22
F1536-01	48-character alphanumeric Scientific	462	—	22
F1537-00	94-character ASCII	462	—	22
F1537-03	64-character universal ISO OCR-B	462	—	22
F1537-04	64-character universal OCR H-14	462	—	22
F1537-05	58-character COBOL-FORTRAN-Business	462	—	22
F1537-06	177-character international	462	—	22
F1537-09	24-character Numeric	462	—	22
F1537-11	68-character universal OCR-A	462	—	22
F1537-12	68-character universal OCR-B	462	—	22
F1537-13	68-character universal 77L	462	—	22
2703-00	Optical Document Reader; 300 dpm	47,664	209	993
F1108-00	600-dpm Speed Upgrade (for 2703-00)	12,000	36	250
F1163-00	Modulus 10 Check Digit (for 2703-00)	1,104	5	23
F1106-00	Mark Read — EBCDIC (for 2703-00)	9,024	41	188
F1106-01	Mark Read — ASCII (for 2703-00)	9,024	41	188
F1149-00	Punch Card Read Feature (for 2703-00); requires F1106-00 or -01	3,024	11	63
F1154-00	Validity Check Feature (for 2703-00)	528	0	11

DATA COMMUNICATIONS SUBSYSTEMS

F1395-00	Voice-Grade Communications Interface (for Series 90 Processor); coordinates a BSC line and a 201A, 201B, 202C, or 202D type modem at up to 19,000 bits/second	768	5	16
F1395-01	Telpak Communications Interface (for Series 90 Processor); coordinates a BSC line and a 301B, 303B, 303C, or 303D type modem	2,064	5	43
8577-02	DCS Cabinet; provides power supply and housing for up to 4 DCS-1 or -1C	2,976	5	62
F1000-00	Line Terminal Control-1 (for DCS-1); controls 1 duplex line	4,799	17	113
8575-00	Line Terminal Control-4 (for DCS-4); controls 4 duplex lines	12,432	50	259
8575-01	Line Terminal Control-16 (for DCS-16); controls 14 duplex lines	26,208	107	546
F1357-00	Line Terminal Control 1C (for binary synchronous; not supported by UNIVAC software)	6,432	30	134

NOTE: Numerous line terminals, communications interfaces, and optional features enable the above controls to accommodate a wide range of communications facilities and equipment.

90/70 COMMUNICATIONS INTELLIGENCE CHANNEL

8580-00	Communications Intelligence Channel; includes basic CIC with locations for 16 line adapters (8 full-duplex or 16 half-duplex) and multiplexer postions to support them	27,216	201	567
F1822-99	Line Adapter Expansion; expands the number of line adapter locations from 16 to 64 (32 full-duplex or 64 half-duplex), and includes multiplexer positions for an additional 8 full-duplex or 16 half-duplex adapters	4,080	27	85
F1823-00	Multiplexer Expansion; expands the number of CIC multiplexer positions to permit interface and control of an additional 16 line adapters. A maximum of three units may also be used to support a total of 128 line adapters when 8581-99 is used	7,393	21	154
F1824-00	Dual Channel; permits non-simultaneous operation of the CIC on two 90/70 systems	2,016	5	42
F1825-00	Active Line Indicator; provides a display panel to display line activity on up to 16 half-duplex or 8 full-duplex communication lines	528	2	11
F1825-01	Line Indicator Expansion; expands the number of active line displays by 8 full-duplex or 16 half-duplex lines to a maximum of 7 expansions. Requires installation of F1825-00	528	2	11
F1826-00	Synchronous Line Adapter; provides a full-duplex or half-duplex interface to synchronous data sets conforming to RS-232 and CCITT. Compatible with MIL 188C low-level interface electrical characteristics. Requires cable selection	912	7	19
F1826-01	Synchronous Line Adapter; same as F1826-00 and provides reverse channel of up to 150 bits per second asynchronous; requires two ports	1,392	8	29
F1827-00	Synchronous Line Adapter; same as F1826-00 except permits exact compliance with the MIL 188C low-level interface; control line polarity is RS-232. Requires polarity selection	912	7	19
F1828-00	Asynchronous Line Adapter; provides a full-duplex or half-duplex interface to asynchronous data sets conforming to RS-232 and CCITt; compatible with MIL 188C low level interface electrical characteristics	720	6	15
F1828-01	Asynchronous Line Adapter; same as F1828-00 and provides reverse channel of up to 5 bits per second	912	7	19
F1828-02	Asynchronous Line Adapter; same as F1828-00 and provides reverse channel of up to 150 bits per second asynchronous; requires two ports	1,104	8	23

*Rental prices do not include equipment maintenance.

UNIVAC 90/60 and 90/70
EQUIPMENT PRICES

		Purchase Price	Monthly Maintenance	Rental (1-year lease)*
90/70 COMMUNICATIONS INTELLIGENCE CHANNEL (Continued)				
F1829-00	Asynchronous Line Adapter; same as F1828-00 except permits exact compliance with the MIL 188C low level interface. Control line polarity is RS-232. Requires polarity selection	720	6	15
F1830-00	Wideband Line Adapter; provides a synchronous full-duplex interface to an AT&T 300 Series data set operating at 40.8K bits per second with 56K bits per second top speed	1,104	8	23
F1830-01	Wideband Line Adapter; provides a synchronous full-duplex interface with an AT&T 300 Series data set at 50K bits per second. Includes autoanswering capability	1,104	8	23
F1831-00	Dial Adapter Single; provides the interface to both rotary or touch-tone auto dialing units. Requires a line adapter location for each Dialing Unit	720	6	15
F1832-00	Asynchronous Relay Line Adapter; provides an asynchronous full-duplex interface optionally compatible with either 20-75 MA neutral or 10-40 MA polar telegraph lines	720	6	15
8581-99	CIC Expansion; includes locations for 64 additional line adapters, 32 full-duplex or 64 half-duplex. Expands the CIC to its maximum configuration of 128 half-duplex lines. Also includes multiplexer positions for an additional 8 full-duplex of 16 half-duplex adapters. All features described under 8580-00 are applicable except F1822-99, F1824-00, and F1825-00	17,280	53	360
F1835-00	TWX Line Adapter; provides an interface to the USA TWX network	720	6	15
F1836-00	Telex Line Adapter; provides an interface to the USA WU Telex Network	720	6	15
F1841-00	Auto-Data Rate Detect; provides automatic transmission rate and code level detection for asynchronous input data. Used with F1828 or F1829. One required for CIC to service all asynchronous line adapters	1,104	8	23
F1842-00	Translate Expansion; provides for two additional programmable translation tables	1,536	7	32
F1849-00	Line Adapter Sharing; provides the ability for two CIC's to share a common set of line adapters. One feature is required for each set of 16 half-duplex or 8 full-duplex lines to be shared	1,536	7	32

*Rental prices do not include equipment maintenance.

UNIVAC 90/60 and 90/70

NEW PRODUCT ANNOUNCEMENT

8430 DISK STORAGE FACILITY: In January 1974, UNIVAC announced a new disk storage facility designed to provide its 90/60 and 90/70 computer systems with mass storage capabilities equivalent to the IBM Model 3330 Disk Storage Facility. The new disk drive, designated the UNIVAC 8430 Disk Storage Facility, is being manufactured by Information Storage Systems, Inc. (ISS), which was acquired by Sperry Rand last year.

The UNIVAC 8430 Disk Storage Facility uses the industry-standard removable IBM 3336-type disk pack or equivalent, which can store up to 100,018,000 bytes. One Model 5039 Control Unit can control up to eight Model 8430 Disk Storage Drives, for a total of 800,146,000 bytes of on-line storage capacity. A second string of eight drives can be added to a 5039/8430 facility when the F2047 16-Drive Expansion feature is incorporated. A minimum 5039/8430 Disk Storage Facility consists of two Model 8430 Disk Drives and one Model 5039 Control Unit. Thus, a 5039/8430 subsystem can contain between 200 million and 1.6 billion bytes of on-line storage. Since the UNIVAC 8430 Disk Storage Facility utilizes the single-spindle-per-cabinet design (in contrast to the IBM multiple-spindle-per-cabinet configuration), additional disk drives can be added to a UNIVAC 8430 subsystem in single-drive increments up to the maximum of 16 disk drives per control unit.

The performance characteristics of the UNIVAC 8430 Disk Storage Facility include an average head positioning time of 27 milliseconds, an average rotational delay of 8.33 milliseconds, and a data transfer rate of 806,000 bytes per second. A Dual Channel Feature permits the 5039 control unit to be attached to two computers for shared operation or to two selector channels on the same computer. A Dual Access Feature permits simultaneous read and write operations on any two 8430 Disk Drives in a subsystem.

The new Model 8430 Disk Storage Facility supersedes the previously announced Model 8440 Disk Storage Facility for UNIVAC 90/60 and 90/70 computer systems, but is not available for UNIVAC 1100 Series computer systems. First delivery, with software support under the OS/7 Operating System, was scheduled for August 1974. Prices are included in the newly updated UNIVAC 90/60 and 90/70 Equipment Prices section.