Univac System 80

New Product Announcement

Sperry Univac introduced the System 80, a medium-range, general-purpose computer system with primary emphasis on ease of use and interactive operation, on April 16, 1980. The System 80 uses the company's proven OS/3 software, augmented with a number of impressive new facilities, and will effectively replace the earlier OS/3-oriented Univac 90/25, 90/30, and 90/40 systems. The vendor states that the System 80, as compared to these earlier systems, "is one-fifth the size, consumes less than half the power, is almost twice as fast, and costs about 50 percent less."

First customer deliveries of the System 80 are scheduled for December 1980. A basic configuration can be leased for $2,469 per month (including software and services, which are now separately priced).

The System 80 utilizes state-of-the-art multiple-microprocessor architecture and emitter-coupled logic (ECL) circuits which promise high reliability and easy maintenance. It can be used effectively either as a stand-alone computer or as part of a distributed processing network. Moreover, it is designed for operation either in a computer room or in a controlled office environment. The basic processor complex requires only about 30 square feet of floor space.

Sperry Univac has booked approximately 3000 orders for its 9/25, 90/30, and 90/40 computers to date and is planning to "substantially exceed that performance" with the System 80. The firm expects to draw about 70 percent of its System 80 customers from users who currently have competitive systems from IBM, Honeywell, NCR, and Burroughs. The IBM System/3 market is a particular target. Furthermore, Sperry Univac expects more than half of the System 80 customers to come from the manufacturing and distribution industries, and is offering impressive application programs to aid these users in implementing their systems.

CONFIGURATION: The minimum System 80 configuration consists of a processor complex plus a free-standing printer. The processor complex, in turn, consists of a control processor, a main storage processor with 262K bytes of memory, a disk channel/control and one integrated 118.2-megabyte nonremovable disk drive, a diskette control and one diskette drive, a workstation control and one console workstation, and a paper peripheral control which controls the printer.

The basic System 80 can be expanded by connecting additional peripheral devices to any or all of the four integrated controls. The disk channel/control can control up to seven additional disk drives of the fixed or removable-media type. The diskette control can handle up to three additional drives. The workstation control accommodates up to seven additional local workstations. The paper peripheral control can handle a second printer and either two card readers or one card reader and one card punch. The basic processor complex also includes provisions for a magnetic tape control, one or two data communications lines, and one additional peripheral control. The system can be further expanded by adding the Input/Output Microprocessor (IOMP), which permits the connection of up to three additional peripheral controls and six additional data communications lines.

CENTRAL PROCESSOR: The System 80 processor complex contains two modular processors: a control processor with an associated control storage unit, and a main storage processor which controls the main storage unit. The control processor performs arithmetic computations and contains the control logic required for instruction execution, system control, and I/O channel support functions in conjunction with the microinstructions residing in control storage. The basic System 80 instruction repertoire consists of 128 instructions, including 44 floating-point instructions, and is a superset of the Univac 90/30 instruction set.

The System 80 processor is offered in two models which differ primarily in the cycle times of their control storage units: 240 nanoseconds for the Model 3 processor and 180 nanoseconds for the Model 5. The faster control storage gives the Model 5 a 55 percent processing speed advantage over the Model 3. A Model 3 processor can be field-upgraded to a Model 5 by adding the High-Performance Control Storage (HPCOS) option. The System 80 Model 5 processor is rated at about 1.4 times the processing power of the older Univac 90/40, while the System 80 Model 3 is about 15 percent faster than the 90/30.

Both the Model 3 and Model 5 processors have a basic main storage capacity of 262,144 bytes, which can be expanded to 524,288 bytes, 786,432 bytes, or 1,048,576 bytes through the addition of 262K-byte increments. The byte-addressable main storage is composed of 16K-bit MOS chips and has a cycle time of 400 nanoseconds per 4-byte access. Error correction code (ECC) logic provides automatic detection and correction of single-bit memory errors as well as detection of double-bit errors.

DISK STORAGE: The System 80 features an integrated microprocessor-controlled disk channel/control (DC/C) that directly accesses main storage and accommodates up to eight disk

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is included with the hardware. A basic System 80, consisting of a 262K-byte processor complex, 118.2-megabyte fixed disk drive, console workstation, 300-lpm printer, manual diskette drive, autoload diskette unit, and one additional workstation, can be purchased for $79,628 or leased on a five-year agreement for $2,164 per month, including maintenance. Sperry Univac states that typical monthly lease costs, including software, maintenance, and support charges, will range from about $2,469 for a small system to $9,154 for a large configuration using a variety of program products.

An aggressive new Sperry Univac pricing policy enables System 80 buyers to benefit from three types of discounts from the list prices quoted above and in the price list that follows. In addition to its standard five-year lease and short-term rental agreements, the company is offering the System 80 on a six-year lease contract at a discount of 10 percent from the five-year lease rates. Orders for purchased System 80 equipment entered during Sperry Univac's current fiscal year, which ends on March 31, 1981, will qualify for a 10 percent discount from the list purchase prices. The firm is also offering a quantity discount for 10 or more systems procured under a single order and installed within 24 months. The quantity discount is 6 percent for 10 to 14 systems, 8 percent for 15 to 19 systems, and 10 percent for 20 or more systems.□

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-Year Lease)*	Rental (5-Year Lease)*
PROCESSORS AND MEMORY					
3045-99	System 80 Model 3 Processor; includes 262K bytes of main storage, basic control storage, disk channel/control and 118.2-megabyte fixed disk drive, workstation control and console workstation diskette control, and paper peripheral control**	$53,874	$355	$1,427	$1,128
3045-95	System 80 Model 5 Processor; includes 262K bytes of main storage, High-Performance Control Storage (HPCOS), disk channel/control and 118.2-megabyte fixed disk drive, workstation control and console workstation, diskette control, and paper peripheral control**	71,514	403	1,757	1,422
F2783-05	262K Storage Expansion; expands a System 80 Processor from 262K to 524K bytes	5,821	29	158	126
F2783-06	262K Storage Expansion; expands a System 80 Processor from 524K to 786K bytes or from 786K to 1048K bytes	5,821	29	158	126
F3358-02	Processor Upgrade; upgrades a Model 3 to Model 5; either F3425-00 or 1943-99 is also required	7,665	50	196	155
1943-99	I/O Microprocessor; adds third through eighth communications line capability and fifth through seventh peripheral control capability	7,665	50	196	55
F3425-00	Micrologic Expansion; provides I/O channel functionality in the HPCOS via microcode	3,675	21	106	84
F2829-00	Processor Power Expansion; required if any SLCA is added and I/O Microprocessor is not present	735	5	33	26
F3619-02	Console Keyboard, Model A; provides a typewriter-style keyboard for the console workstation; choice of 8 character sets	403	2	12	9
F3620-01	Console Keyboard, Model B; provides a typewriter-style keyboard, 10-key numeric pad, and function pad; choice of 8 character sets	428	3	15	13
F2787-98	Head/Disk Assembly; for use in integrated disk drive only	2,912	19	85	68
F2787-99	Head/Disk Assembly with Fixed Heads; for use in integrated disk drive only	3,883	37	132	110
F2787-97	Head/Disk Assembly with Fixed Heads; provides 0.86 megabyte of fixed-head storage for field-upgrading an F2787-98	4,383	37	145	120
DISK STORAGE					
8417-00	8417 Disk Drive Cabinet; houses up to three F2834-00 Fixed-Media Disk Drives	1,234	5	34	27
F2834-00	Fixed-Media Disk Drive; requires an 8417-00 Cabinet and one F2787-XX HDA per drive	5,525	30	188	150
F2787-00	Head/Disk Assembly with Fixed Heads; provides 118.2 megabytes of fixed-media storage and 0.86 megabyte of fixed-head storage	3,883	37	132	110
F2787-01	Head/Disk Assembly; provides 118.2 megabytes of fixed-media storage	2,912	19	85	68
F2787-02	Head/Disk Assembly with Fixed Heads; provides 0.86 megabyte of fixed-head storage for field-upgrading an F2787-01	4,383	37	145	120
8419-00	8419 Disk Drive; 72.3-megabyte removable-media disk drive and cabinet; maximum of 7 drives per system	19,340	98	487	394
F3542-00	8419 Removable Disk Pack; for 8419-00 drives; 72.3 megabytes; maintenance contract not available	446	—	25	20
8420-00	Autoload Diskette Subsystem; cabinet and one drive capable of processing up to 20 diskettes	4,235	26	105	83
F2833-00	8420 Manual Diskette Expansion; adds one manual diskette drive within the 8420-00 cabinet	1,509	9	39	30
8422-00	Manual Diskette Subsystem; cabinet and one manual diskette drive (up to 1-megabyte capacity)	1,509	9	39	30
F2785-00	8422 Second Drive Expansion; adds a second drive to the 8422-00 cabinet	1,412	9	35	28
F2785-02	8422 Dual Drive; adds a third and fourth diskette drive to the 8422-00 cabinet	2,695	16	66	53

*Rental prices do not include maintenance.
**Minimum system requires the addition of F2787-98 or -99 Head/Disk Assembly, 8420-XX or 8422-XX Diskette Sybsystem, F3619-02 or F3620-02 Console Keyboard, and 0776 or 0789 System Printer. Model 5 also requires either F3425-00 Micrologic Expansion or 1943-99 I/O Microprocessor.

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EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-Year Lease)*	Rental (5-Year Lease)*
WORKSTATIONS					
3560-79	System 80 Local Workstation, Mod 1; free-standing, microprocessor-based CRT display station; requires F3619-00 or F3620-00 Keyboard; 60 Hz, 120 volts	3,163	13	82	63
3560-78	As above, except 50/60 Hz, 100/120/220/240 volts	3,163	13	82	63
F3619-00	Keyboard, Model A; typewriter-style keyboard; choice of 8 character sets	403	2	12	9
F3620-00	Keyboard, Model B; typewriter-style keyboard, 10-key numeric pad, and function pad; choice of 8 character sets	428	3	15	13
F2919-00	Peripheral Table; for System 80 peripherals such as workstation and card reader	368	—	22	16
F2791-00	Workstation Control; provides control and interface facilities for configuring up to eight additional workstations	1,897	11	51	40
MAGNETIC TAPE					
0871-99	Uniservo 10 9-Track Phase-Encoded Prime Tape Unit and Controller; 40 KB/sec; supports up to 7 additional 0871-83 drives	30,582	160	893	656
0871-95	Uniservo 10 9-Track Phase-Encoded and NRZI Prime Tape Unit and Controller; 40/20 KB/sec.; supports up to 7 additional 0871-83 or 0871-81 drives in any combination	32,714	193	981	719
0871-91	Uniservo 10 7-Track NRZI Prime Tape Unit and Controller; 20/13.9/5 KB/sec.; supports up to 7 additional 0871-83, 0871-81, or 0871-79 drives in any combination	31,816	190	970	714
0871-87	Same as 0871-91, except it permits reading of IBM 7-track compatible tape	31,816	190	970	714
F3135-00	9-Track NRZI Capability for 0871-99 Controller; required for control of NRZI drives	788	25	55	42
F3133-99	7-Track NRZI Capability for 0871-95 Controller; required for control of 7-track drives	446	5	22	16
F3133-98	7-Track NRZI Native-Mode Capability for 0871-95 Controller	446	5	22	16
0871-83	Uniservo 10 9-Track Phase-Encoded Add-On Tape Unit; 40 KB/sec.	13,668	74	308	223
0871-81	Uniservo 10 9-Track Phase-Encoded and NRZI Add-On Tape Unit; 40/20 KB/sec.	15,012	82	341	244
0871-79	Uniservo 10 7-Track NRZI Add-On Tape Unit; 20/13.9/5 KB/sec.	13,668	74	308	223
PRINTERS					
F2789-00	Paper Peripheral Control; allows connection of two printers (cannot exceed 1500 lpm total) and either two card readers or a card reader and a card punch	1,818	9	46	37
1955-99	Remote Printer Attachment; controls one remotely located 0789-XX printer up to 5000 feet the processor complex	3,743	20	99	79
1955-97	Same as 1955-99, except includes Katakana	3,743	20	99	79
0789-99	Printer; prints 48 characters at 180 lpm; 132 positions; requires F2865-XX Print Band	10,584	80	275	204
0789-96	Printer; prints 48 characters at 300 lpm; 132 positions; requires F2865-XX Print Band	12,500	122	287	213
F2970-00	Upgrades 180-lpm Printer to 300 lpm	1,916	42	12	9
Print Bands for 180-lpm and 300-lpm Printers:					
F2865-01	48-character business/commercial set	184	—	—	—
F2865-06	48-character scientific set	184	—	—	—
F2865-09	48-character set for United Kingdom	184	—	—	—
F2865-10	48-character set for Denmark and Norway	184	—	—	—
F2865-02	48-character set for Finland and Sweden	184	—	—	—
F2975-11	64-character set for Denmark and Norway	184	—	—	—
F2865-03	64-character set for Finland and Sweden	184	—	—	—
F2865-04	64-character modified FORTRAN set	184	—	—	—
F2865-00	64-character modified ASCII set	184	—	—	—
F2865-05	96-character ASCII set	184	—	—	—
F2865-07	128-character universal OCR-B (ISO) set	184	—	—	—
F2865-13	128-character universal OCR H-14 set	184	—	—	—
F2865-18	192-character COBOL-FORTRAN-business set	184	—	—	—
F2865-12	96-character set for Finland and Sweden	184	—	—	—
F2865-08	128-character universal OCR-B (ECMA-11) set	184	—	—	—
F2865-17	128-character universal Univac 77L set	184	—	—	—
F2865-15	128-character universal OCR-A set	184	—	—	—
0789-93	Printer; prints 48 characters at 640 lpm; 132 positions; requires F3321-XX Print Band	15,650	143	364	273
F3321-XX	Print Band; for 640-lpm printer; available in all the same versions as the F2865-XX Print Band, above	184	—	—	—
0776-99	Printer; prints 48 characters at 1200 lpm; 136 positions; requires F2346-XX Print Cartridge	47,421	298	1,294	988
F2346-XX	Print Cartridge; for 1200-lpm printer; available in all the same versions as the F2865-XX Print Band, above	1,440	—	35	26
CARD EQUIPMENT					
0719-94	Card Reader; 80-column, 300 cpm	6,363	39	171	122
0608-03	Card Punch; 80-column, 75-160 cpm	14,020	85	378	269
F2830-00	Reader Feature for 0608-03	648	5	15	13

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COMMUNICATIONS					
F2799-XX	Single-Line Communications Adapter, Low-Speed Asynchronous; supports TTY and DCT 500 protocols; ASCII code, half duplex at up to 2400 bps; provides auto answer; choice of RS-232C/X.21.BIS or MIL-188A interface	1,885	11	48	38
F2788-XX	Single-Line Communications Adapter, Medium-Speed Synchronous; supports Uniservo 100/200 and UTS 400 protocols; half duplex to 9600 bps, full duplex to 4800 bps; requires external clock; provides auto answer; choice of RS-232C/X.21.BIX or MIL-188A interface	1,743	9	44	35
F2798-XX	Single-Line Communications Adapter, Medium-Speed Synchronous (UDLC); supports UDLC protocol; half or full duplex at 2000 to 9600 bps; requires external clock; provides auto answer; RS-232C/X.21.BIS interface	1,885	11	48	38
F3471-00	SLCA Power Cable; required if two SLCA's are used and 1943-99 I/O Microprocessor is not used	53	—	8	5
F3742-00	SLCA Baffle; required if one SLCA is used and 1943-99 I/O Microprocessor is not used	53	—	8	5

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SOFTWARE PRICES

		Monthly Rental
SYSTEMS SOFTWARE		
6211-99	Extended System Software; consists of Screen Format Generator, Dialog Specification Language Translator, Data Utility, SORT/MERGE, SORT3, and Spooling and Job Accounting	$147
6212-00	SORT/MERGE	53
6213-00	SORT3	53
6219-99	RPG II	53
6222-00	COBOL-1974	74
6223-00	FORTRAN IV	84
6224-00	BASIC	74
6225-00	ESCORT	42
6233-00	Assembler	158
6226-00	Editor	42
6217-00	Information Management System	116
6218-00	Data Management System	184
6231-00	ICAM Terminal Support Facility	95
6230-00	NTR (Nine Thousand Remote) System Utility	26
6229-00	Distributed Processing Transfer Facility	84
6130-03	UTS 400 COBOL	32
6201-03	UTS 400 Edit Processor	33
6228-00	UTS 400 Load/Dump Facility	32
APPLICATIONS SOFTWARE		
6563-01	UNIS 80; ready-to-use version	500
6563-00	UNIS 80-E; extended, source-code version	950
6557-00	ACS 80 Accounts Receivable	55
6557-01	ACS 80 Accounts Payable	55
6557-02	ACS 80 General Ledger	55
6557-03	ACS 80 Payroll	65
6558-00	ICS 80 (Information Collection System)	125
6564-01	Order Entry 80; ready-to-use version	315
6564-00	Order Entry 80-E; source-code version	420
6562-00	UNIDIS—Wholesale; Order Entry and Stock Control	420
6562-01	UNIDIS—Wholesale; Inventory Management	420
6562-99	UNIDIS—Wholesale; Order Entry, Stock Control, and Inventory Management	840

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CONFIGURATION: The minimum System 80 configuration consists of a processor complex plus a free-standing printer. The processor complex, in turn, consists of a control processor, a main storage processor with 262K bytes of memory, a disk channel/control and one integrated 118.2-megabyte nonremovable disk drive, a diskette control and one diskette drive, a workstation control and one console workstation, and a paper peripheral control which controls the printer.

The basic System 80 can be expanded by connecting additional peripheral devices to any or all of the four integrated controls. The disk channel/control can control up to seven additional disk drives of the fixed or removable-media type. The diskette control can handle up to three additional drives. The workstation control accommodates up to seven additional local workstations. The paper peripheral control can handle a second printer and either two card readers or one card reader and one card punch. The basic processor complex also includes provisions for a magnetic tape control, one or two data communications lines, and one additional peripheral control. The system can be further expanded by adding the Input/Output Microprocessor (IOMP), which permits the connection of up to three additional peripheral controls and six additional data communications lines.

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DISK STORAGE: The System 80 features an integrated microprocessor-controlled disk channel/control (DC/C) that directly accesses main storage and accommodates up to eight disk

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drives. One nonremovable 118.2-megabyte disk drive is included in every System 80 configuration, and up to seven additional drives using either removable or nonremovable disks can be added.

Each of the nonremovable disk drives has a storage capacity of 118.2 megabytes. Average positioning time is 35 milliseconds, average rotational delay is 8.8 milliseconds, and the data transfer rate is 1.1 megabytes per second. The nonremovable disk drives can be equipped with an optional Fixed-Head feature that adds 56 fixed read/write heads serving an additional 860,160 bytes of storage. Average access time to this storage is only 8.8 milliseconds.

The removable disk drive is a free-standing unit that uses interchangeable, 4-platter disk packs with a storage capacity of 72.3 megabytes each. Average positioning time is 33 milliseconds, average rotational delay is 10.7 milliseconds, and the data transfer rate is 780 kilobytes per second.

DISKETTES: A diskette subsystem, consisting of a diskette control and from one to four drives, is a standard component of every System 80. A microprocessor controls and buffers all diskette operations. Several diskette recording formats are available, including the IBM-compatible Basic Data Exchange (BDE) format, with 256 kilobytes per diskette and a 31 KBS data transfer rate, and the Sperry Univac double-density format, with 1 megabyte per diskette and a 62 KBS data rate. Manual and autoload diskette drives can be intermixed. The new autoload diskette drive allows automatic processing, in sequential order, of up to 20 standard diskettes. The operator simply places the diskettes into the unit's hopper and then removes them from the stacker.

WORKSTATIONS: The basic System 80 configuration includes a console workstation and a microprocessor-based workstation control that can accommodate up to seven additional workstations. A system equipped with the Input/Output Microprocessor can handle up to four additional workstation controls, each controlling a maximum of eight workstations. The workstations are cable-connected to the processor complex and can be located up to 5000 feet (1524 meters) away from it. The control unit contains dedicated buffers for each workstation, allowing the workstations to transfer data concurrently through a serial interface at a data rate of 9600 bits per second.

The System 80 workstation is a keyboard/display unit designed for ease of operation. A 12-inch CRT displays 24 lines of data plus a system status line, and each line can contain up to 80 characters. By pressing a function key, the operator can cause a workstation to operate in either of two modes. Workstation mode, the normal mode of operation, is used when communicating with application programs. System mode provides a direct interface to the OS/3 operating system, enabling the operator to make system inquiries, activate jobs, and perform other system functions.

LINE PRINTERS: Sperry Univac offers four line printers for the System 80. Their rated speeds with a 48-character set are 180, 300, 640, and 1200 lines per minute. The 1200-lpm printer has 136 print positions, while the other three models have 132. Each paper peripheral control can support one or two line printers with a combined print capacity of up to 1500 lines per minute. In addition, a remote printer attachment permits the connection of one 180-, 300-, or 640-lpm printer located up to 5000 feet (1524 meters) away from the processor complex.

CARD EQUIPMENT: Although the System 80 is strongly oriented toward interactive processing, an 80-column card reader and card punch are available. The card reader is a table-top device rated at 300 cards per minute. The card punch is a free-standing device rated at 75 cpm when punching all 80 columns or at 160 cpm when punching only the first 28 columns of each card. The punch can be equipped with an optional pre-punch read station. Each paper peripheral control can support either two card readers or one card reader and one punch.

MAGNETIC TAPE: The only magnetic tape subsystem currently available for the System 80 is the Uniservo 10, a low-speed, low-cost subsystem that reads and records data on standard ½-inch tape in IBM-compatible formats. The Uniservo 10 tape drive is offered in three models: 9-track phase-encoded (1600 bpi, 40 KBS), 9-track NRZI (800 bpi, 20KBS), and 7-track NRZI (200/556/800 bpi, 5/13.9/20 KBS). A Uniservo 10 subsystem consists of a prime tape unit, with built-in controller, plus up to seven additional tape units. The tape subsystem is connected to a special port in the processor complex.

COMMUNICATIONS: In addition to the directly connected workstations, a basic System 80 can support one or two communications lines. A system equipped with the Input/Output Microprocessor can support up to six additional lines, for a total of eight lines. Data can be transmitted at up to 9600 bits per second over each line. An appropriate Single-Line Communications Adapter (SLCA) provides the interface between the System 80 and each line.

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OPERATING SYSTEM: The System 80 software is based upon the user-proven OS/3 operating system, which is currently in use at more than 2700 customer sites. Introduced in 1975 with the Univac 90/30, OS/3 has been extended and restructured to meet the varied information processing needs of the 1980's. It now supports batch, interactive, remote communications, and distributed processing environments, and offers dynamic resource management, 14 levels of multiprogramming, a variety of "ease-of-use services," 6 programming languages, and systems for transaction and data base processing.

The OS/3 job control facilities allow the definition, initiation, and control of up to 14 simultaneous jobs with up to 256 subtasks per job step. Jobs and tasks are scheduled in response to job control language (JCL) statements entered from the system console, workstations, or remote terminals. An interactive prompting facility simplifies the creation of JCL statements and job streams.

OS/3 includes a consolidated data management system that serves as the controlling interface between application programs, the system hardware, and OS/3. There are separate asccess methods for disk, diskette, workstation, magnetic tape, and unit record input/output. Access to disk files is controlled by the Multiple Indexed Random Access Method (MIRAM), a single access method that provides four ways of accessing disk records: sequentially in order of placement, sequentially by ascending key, randomly by multiple keys, or randomly by relative record number.

OS/3 also includes a number of system service programs. Among these are two program librarians; a linkage editor; disk, diskette, and tape initialization routines; system and user dump routines; two print utilities; a catalog manipulation utility; a disk dump/restore utility; a system patch routine; and system installation facilities.

EXTENDED SYSTEM SOFTWARE: This optional, separately priced extension of OS/3 provides six additional software components that significantly enhance the utilization and operation of the System 80. These components are described in the following paragraphs.

The *Screen Format Generator (SFG)* is designed to facilitate the programming of screen formats for System 80 workstations by enabling users to create, modify, and delete formats and maintain the files in which these formats are stored. Prompting at each step of the process is optional. Formats generated by the SFG are independent of user programs, and can be changed without necessitating recompilation of the programs.

The *Dialog Specification Language (DSL)* is a high-level language designed to facilitate the creation of interactive dialogs between the System 80 and its users. Each dialog is a series of questions to which the user at a workstation or remote terminal responds with appropriate information. DSL allows the programmer to specify the dialog structure, format and mapping rules, and record structure. The DSL translator processes the specifications and stores the resulting dialog.

The *Data Utility* is a versatile utility program for reproducing and maintaining data files on cards, tape, disk, or diskette. Statements describing the files and the desired processing are entered either through a job control stream (in batch mode) or in response to screen prompts (interactively).

SORT/MERGE can operate either as an independent sort/merge program defined and initiated by JCL statements, or as a modular sort/merge subroutine integrated into user programs. Input and output to the sort or merge may be on disk, diskette, or magnetic tape, and work files may be on either disk or tape.

SORT3 is an IBM System/3-compatible sort program that can sort and reformat selected records from as many as nine input files on cards, tape, disk, or diskette. SORT3 can perform full-record sorts, tag sorts, and summary sorts.

The *Spooling and Job Accounting* facility increases system throughput by transferring data between low-speed peripheral devices and disk storage independently of the programs that use the data. Both input spooling and output spooling are provided. Job accounting information for each job that runs on the system is generated as part of the spooling function. Special programs are provided to process this information and produce a detailed job accounting report.

PROGRAMMING LANGUAGES: System 80 users will have a choice of six programming languages: COBOL, FORTRAN IV, BASIC, RPG II, ESCORT, and BAL.

The OS/3 *COBOL* compiler conforms to the specifications of American National Standard COBOL X3.23-1974. The following standard COBOL language modules are implemented, all at

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Level 2: Nucleus, Table Handling, Sequential I/O, Relative I/O, Indexed I/O, Sort, Segmentation, Library, Debug, Inter-Program Communications, and Communications. In addition, the compiler contains a number of useful extensions, including a non-English language feature and an extended program test facility.

The OS/3 *FORTRAN IV* compiler implements the ANS FORTRAN X3.9-1966 language, together with numerous extensions designed to provide compatibility with IBM DOS FORTRAN IV and Sperry Univac Series 70 FORTRAN.

OS/3 *BASIC* is an interactive programming system that is compatible with Dartmouth BASIC and with American National Standard Minimal BASIC X3.60-1978, with extensions. Files, subprograms, string handling, chaining, and user-defined functions are supported. BASIC source programs can be entered and compiled interactively, and syntax errors can be corrected immediately.

OS/3 *RPG II* is an industry-compatible report program generator with extensions designed to facilitate programming and maintenance. It can compile RPG II source statements written for the IBM System/3, System/360, and System/370 computers and for the Univac 9200, 9300, 9400, and 9480. Significant extensions include an Auto Report facility that simplifies RPG II programming, IMS "action program" support, workstation support, a formatted error analysis capability, and an RPG II Editor that facilitates the creation and editing of RPG II programs from a workstation or terminal.

ESCORT is a high-level language, introduced with the Univac BC/7 computers, that facilitates the preparation of programs for generating reports, entering data, processing transactions, making file inquiries, and maintaining data files.

Basic Assembly Language (BAL) is a versatile symbolic language that gives the user full control of the System 80 hardware facilities by providing a mnemonic code for each machine instruction. BAL also provides facilities for macro instructions, procedural directives, and operand expressions.

EDITOR: The System 80 Editor is an interactive facility for creating, copying, and merging files and for adding, deleting, and modifying text. It provides convenient commands for creating and updating records in data files, library files, and spool files.

INFORMATION MANAGEMENT SYSTEM: The System 80 Information Management System (IMS) is an interactive transaction processing system with integrated file management facilities. It includes an inquiry/update language, UNIQUE, that is designed for general-purpose file processing and requires no programming knowledge. IMS also supports application programs written by the user in COBOL, RPG II, or BAL. Programming is simplified because IMS handles all the communications and file I/O functions.

IMS is transaction-oriented. Processing is triggered by a message from a workstation or remote terminal. Application programs, called "action programs," process the input message, access data files as necessary, and return the appropriate response to the terminal. IMS can access conventional files, specially defined files, or DMS data bases. It supports the processing of transactions in batch mode as well as in the normal interactive mode.

DATA MANAGEMENT SYSTEM: DMS is Sperry Univac's CODASYL-compatible data base management system for the System 80 computers. It consists of a collection of programs designed to handle the description, initialization, creation, accessing, maintenance, backup, and recovery of data bases. DMS has four major components: the Data Description Language (DDL), Data Manipulation Language (DML), Data Base Management System (DBMS), and Data Base Utilities.

Interfacing between DMS and the IMS transaction processing system can be accomplished in several ways. DMS data bases can be accessed by COBOL-coded IMS action programs through DML statements embedded in the programs. Alternatively, DMS data bases can be used to build IMS "defined files" which are accessible via the UNIQUE inquiry/update language or via IMS action programs coded in COBOL, RPG II, or BAL.

COMMUNICATIONS SOFTWARE: The *ICAM (Integrated Communications Access Method) Terminal Support Facility* is a modular component of OS/3 that provides concurrent support for multiple user programs communicating with a variety of terminals and line types. ICAM controls the physical input/output operations between the System 80 processor and the Single-Line Communications Adapters (SLCA's), and performs the following functions: message queuing,

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multiple destination routing, activity scheduling and priority control, timer service, checkpoint/restart procedures, journal control, and accumulation of message and error statistics.

The *NTR (Nine Thousand Remote) System Utility* enables a System 80 to act as a remote batch terminal to a Sperry Univac 1100 Series computer system. NTR is controlled by macro-instructions and console directives, and it can run concurrently with other System 80 jobs.

The *Distributed Processing Transfer Facility* permits the distribution and cooperative processing of user jobs and files among multiple OS/3-supported computers in different locations. The user can view each node in his distributed processing network as an available resource for scheduling and executing his work. Using straightforward commands, he can initiate job distribution and file transfer operations without regard for the intricacies of the hardware, software, and communications protocols involved.

A *UTS 400 COBOL Compiler, Edit Processor,* and *Load/Dump Facility* are provided to facilitate the use of the Sperry Univac UTS 400 Universal Terminal System with the System 80. These software products enable the System 80 to be used for efficient creation, maintenance, and loading of UTS 400 programs and data files.

APPLICATION PROGRAMS: Sperry Univac currently offers five application software systems for the System 80 computers operating under OS/3.

Univac Industrial System 80 (UNIS 80) is a comprehensive production and inventory control system. It provides production engineering data management, product costing, customer order processing, inventory status and control, forecasting and analysis, master scheduling, materials requirement management, production planning, and work order management. The system provides both interactive and batch features and uses data base technology.

Accounting Control System 80 (ACS 80) is a series of packaged applications written in RPG II for general business accounting functions. Four separate modules are available: Accounts Receivable, Accounts Payable, General Ledger, and Payroll. All four modules offer on-line data entry and inquiry capabilities.

Information Collection System 80 (ICS 80) is an on-line data entry system designed to permit efficient collection of data through multiple display terminals. A broad range of data validation and field processing features is provided. ICS 80 can operate simultaneously with other jobs in a multiprogramming environment.

Order Entry 80 is an interactive customer order processing system. Its functions include customer information management, customer and part searching, order entry and control, pricing, stock availability checking and reservation, back order generation and control, picking lists, shipping documents, and invoicing.

Univac Distribution Information System—Wholesale (UNIDIS—Wholesale) is a comprehensive distribution control system that encompasses separate subsystems for order entry and processing, stock control, and inventory management. UNIDIS is an on-line, data base-oriented system, written in COBOL.

COMPATIBILITY: The System 80 is fully compatible with Sperry Univac's earlier OS/3-oriented computers—the 90/25, 90/30, and 90/40. As such, it also offers a high degree of compatibility with the earlier Univac 9000 Series computers, the IBM System/360 and 370, and many of the other byte-oriented systems currently on the market.

The IBM System/3 is a primary marketing target of the System 80, and the conversion process is facilitated by the availability of a System/3-compatible RPG II compiler, sort package (SORT3), disk access method (MIRAM), utility functions, and OCL processor. To bridge the remaining areas of incompatibility between the two systems, Sperry Univac also offers a disk data file conversion procedure and transcribers for System/3 Model 10, 12, and 15 source and proc libraries.

Other conversion aids, including language translators and file transcribers, are available to facilitate conversions to the System 80 from the Univac 9200 and 9300, the OS/4-oriented Univac 9400 and 9480, the IBM System/32 and System/34, the Honeywell Series 100, 200, and 2000, and the Honeywell Series 60, Levels 62 and 64.

PRICING: Sperry Univac has switched from its former largely bundled pricing policy to separate pricing of virtually all of the System 80 software and services. Only the basic OS/3 operating system

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is included with the hardware. A basic System 80, consisting of a 262K-byte processor complex, 118.2-megabyte fixed disk drive, console workstation, 300-lpm printer, manual diskette drive, autoload diskette unit, and one additional workstation, can be purchased for $79,628 or leased on a five-year agreement for $2,164 per month, including maintenance. Sperry Univac states that typical monthly lease costs, including software, maintenance, and support charges, will range from about $2,469 for a small system to $9,154 for a large configuration using a variety of program products.

An aggressive new Sperry Univac pricing policy enables System 80 buyers to benefit from three types of discounts from the list prices quoted above and in the price list that follows. In addition to its standard five-year lease and short-term rental agreements, the company is offering the System 80 on a six-year lease contract at a discount of 10 percent from the five-year lease rates. Orders for purchased System 80 equipment entered during Sperry Univac's current fiscal year, which ends on March 31, 1981, will qualify for a 10 percent discount from the list purchase prices. The firm is also offering a quantity discount for 10 or more systems procured under a single order and installed within 24 months. The quantity discount is 6 percent for 10 to 14 systems, 8 percent for 15 to 19 systems, and 10 percent for 20 or more systems.□

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-Year Lease)*	Rental (5-Year Lease)*
PROCESSORS AND MEMORY					
3045-99	System 80 Model 3 Processor; includes 262K bytes of main storage, basic control storage, disk channel/control and 118.2-megabyte fixed disk drive, workstation control and console workstation diskette control, and paper peripheral control**	$53,874	$355	$1,427	$1,128
3045-95	System 80 Model 5 Processor; includes 262K bytes of main storage, High-Performance Control Storage (HPCOS), disk channel/control and 118.2-megabyte fixed disk drive, workstation control and console workstation, diskette control, and paper peripheral control**	71,514	403	1,757	1,422
F2783-05	262K Storage Expansion; expands a System 80 Processor from 262K to 524K bytes	5,821	29	158	126
F2783-06	262K Storage Expansion; expands a System 80 Processor from 524K to 786K bytes or from 786K to 1048K bytes	5,821	29	158	126
F3358-02	Processor Upgrade; upgrades a Model 3 to Model 5; either F3425-00 or 1943-99 is also required	7,665	50	196	155
1943-99	I/O Microprocessor; adds third through eighth communications line capability and fifth through seventh peripheral control capability	7,665	50	196	55
F3425-00	Micrologic Expansion; provides I/O channel functionality in the HPCOS via microcode	3,675	21	106	84
F2829-00	Processor Power Expansion; required if any SLCA is added and I/O Microprocessor is not present	735	5	33	26
F3619-02	Console Keyboard, Model A; provides a typewriter-style keyboard for the console workstation; choice of 8 character sets	403	2	12	9
F3620-01	Console Keyboard, Model B; provides a typewriter-style keyboard, 10-key numeric pad, and function pad; choice of 8 character sets	428	3	15	13
F2787-98	Head/Disk Assembly; for use in integrated disk drive only	2,912	19	85	68
F2787-99	Head/Disk Assembly with Fixed Heads; for use in integrated disk drive only	3,883	37	132	110
F2787-97	Head/Disk Assembly with Fixed Heads; provides 0.86 megabyte of fixed-head storage for field-upgrading an F2787-98	4,383	37	145	120
DISK STORAGE					
8417-00	8417 Disk Drive Cabinet; houses up to three F2834-00 Fixed-Media Disk Drives	1,234	5	34	27
F2834-00	Fixed-Media Disk Drive; requires an 8417-00 Cabinet and one F2787-XX HDA per drive	5,525	30	188	150
F2787-00	Head/Disk Assembly with Fixed Heads; provides 118.2 megabytes of fixed-media storage and 0.86 megabyte of fixed-head storage	3,883	37	132	110
F2787-01	Head/Disk Assembly; provides 118.2 megabytes of fixed-media storage	2,912	19	85	68
F2787-02	Head/Disk Assembly with Fixed Heads; provides 0.86 megabyte of fixed-head storage for field-upgrading an F2787-01	4,383	37	145	120
8419-00	8419 Disk Drive; 72.3-megabyte removable-media disk drive and cabinet; maximum of 7 drives per system	19,340	98	487	394
F3542-00	8419 Removable Disk Pack; for 8419-00 drives; 72.3 megabytes; maintenance contract not available	446	—	25	20
8420-00	Autoload Diskette Subsystem; cabinet and one drive capable of processing up to 20 diskettes	4,235	26	105	83
F2833-00	8420 Manual Diskette Expansion; adds one manual diskette drive within the 8420-00 cabinet	1,509	9	39	30
8422-00	Manual Diskette Subsystem; cabinet and one manual diskette drive (up to 1-megabyte capacity)	1,509	9	39	30
F2785-00	8422 Second Drive Expansion; adds a second drive to the 8422-00 cabinet	1,412	9	35	28
F2785-02	8422 Dual Drive; adds a third and fourth diskette drive to the 8422-00 cabinet	2,695	16	66	53

*Rental prices do not include maintenance.
**Minimum system requires the addition of F2787-98 or -99 Head/Disk Assembly, 8420-XX or 8422-XX Diskette Sybsystem, F3619-02 or F3620-02 Console Keyboard, and 0776 or 0789 System Printer. Model 5 also requires either F3425-00 Micrologic Expansion or 1943-99 I/O Microprocessor.