Siemens 6.680-XS Business Computers

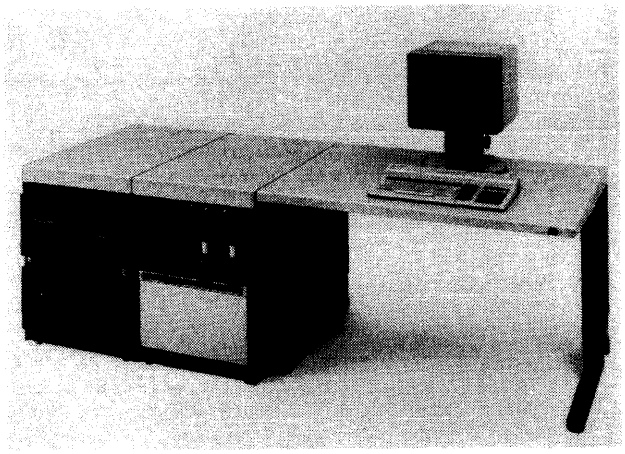
MANAGEMENT SUMMARY

UPDATE: *Siemens has renumbered and greatly enhanced its 6.000 series of minicomputers, now calling it the 6.680-XS Series. This line of business computers consists of four models, ranging from the low-end 6.682-XS to the high-end 6.687-XS. The new models offer greater main memory and storage capacities and support more workstations than the previous models.*

One of the leading companies in the electrical and electronics industries, Siemens AG entered the data processing field in 1954. Since that time, the company has formed cooperative arrangements with other computer manufacturers and broadened its product lines. At present, Siemens ranks second to IBM in its home market where it currently holds a twenty percent share. Its Data Systems Group produces general-purpose mainframes, special-purpose computers, office computers, peripherals, system and application software, PBX systems, and Local Area Networks.

A significant milestone for Siemens was reached in 1986 when the firm formed COMPAREX Informationsysteme GmbH, a joint venture with BASF that enabled BASF to disengage itself from the IBM plug-compatible mainframe arena. This fifty-fifty venture groups the BASF division responsible for the sale of Hitachi equipment with the Siemens unit that sells Fujitsu equipment.

Other agreements that Siemens has entered into are intended to advance various segments of the data processing field as well as to enhance Siemens' position within them. The company recently announced plans to join with Bull, ICL, Nixdorf, Olivetti, and Philips to standardize minicomputer software to run under a Unix derivative. Siemens also has a joint venture with GTE Corporation that in-



Like the other models in the Siemens 6.680-XS Series, the 6.683-XS can function in standalone and distributed environments.

Currently consisting of four upwardly-compatible small business systems, the Siemens System 6.680-XS series ranges from a desktop, single-terminal system up to a system that can support 54 terminals. The System 6.680-XS models can function either as standalone systems or as satellites to central systems.

MAIN MEMORY: 512KB to 8MB.
DISK CAPACITY: 33MB to 1GB.
WORKSTATIONS: 1 to 54.
PRINTERS: 54 cps to 600 lpm.
OTHER I/O: Diskettes, magnetic tape.
PRICE: From approximately DM 22.000 for the 6.682-XS to approximately DM 260.000 for the 6.687-XS.

CHARACTERISTICS

MANUFACTURER: Siemens AG, Vertrieb Marketing, Otto-Hahn-Ring 6, 8000 Munich 83, West Germany. Telephone (089) 6361. Telex 521041.

COMPANY LOCATIONS: *Argentina:* Siemens SA, Avenida Pte. Julio, A. Roca 516, RA-1067 Buenos Aires; *Australia:* Siemens Ltd., 544 Church St., Richmond, Melbourne, Victoria 3121; *Austria:* Siemens AG, Siemenstr. 88-92, A-1210 Vienna. Telephone (0222) 241508; *Belgium:* Siemens SA, Chaussée de Charleroi 116, B-1060 Brussels. Telephone (02) 536 2111; *Brazil:* Siemens SA, Av. Mutinga, 3650, BR-05110 Sao Paulo-SP; *Canada:* Siemens Electric Ltd., 7300 Trans-Canada Highway, Pointe Claire, Québec H9R 1C7; *Colombia:* Siemens SA, Carrera 65, No. 11-83, Bogotá-6; *Costa Rica:* Siemens SA, La Uruca, Apartado 10022, San José; *Denmark:* Siemens A/S, Borupvang 3, DK-2750 Ballerup. Telephone (02) 656565; *Eire:* Siemens Ltd., 8, Raglan Rd., Dublin 4; *El Salvador:* Siemens SA, Avenida Espana, No. 1313 y, 23, Calle Poniente, San Salvador; *Finland:* Siemens Osakeyhtiö, Mikonkatu 8, SF-00100 Helsinki 10; *Greece:* Siemens AE, Voullis 7, GR-10210 Athens; *Guatemala:* Siemens SA, 2a Calle 6-76, Zona 10, Ciudad de Guatemala; *India:* Siemens India Ltd., 134 A, Dr. Annie Besant Rd., Worli, Bombay 400 018; *Italy:* Siemens Elettra S.p.A., Via Fabio Filzi, 29, I-20214 Milan. Telephone (02) 252-0441; *Japan:* Siemens K.K., Gotanda Fujikura Building, 11-20, Nishigotanda 2-chome, Shinagawa-ku, Tokyo 141; *Luxembourg:* Siemens SA, 17, rue Glesener, Luxembourg; *Mexico:* Siemens SA, Poniente 116, No. 590, Col. Ind. Vallejo, Deleg. Azcapotzalco, 02300 Mexico, D.F.; *Netherlands:* Siemens Nederland n.v., Wilhelmina van Pruisenweg 26, NL-2595 AN, The Hague. Telephone (070) 782782; *Nicaragua:* Siemens SA, Carretera Norte, km 6, (Apartado 7), Managua, D.N.; *Norway:* Siemens A/S, Ostre Aker vei 90, N-Oslo 5; *Pakistan:* Siemens Pakistan Engineering Co. Ltd., Ilaco House, Abdullah Haroon Rd., Karachi; *Portugal:* Siemens S.A.R.L., Av. Almirante Reis, 65, P-1100 Lisbon 1; *South Africa:* Siemens Ltd., Siemens House, Corner Wolmarans and Biccard Streets, Braamfontein 2001, Johannesburg 2000. Telephone (11) 715911; *Spain:* Siemens SA, Orense 2, Madrid 20. Telephone (01) 754 1700; *Sweden:* Siemens Aktiebolag Norra, Stationsgatan 63-65, S-10435 Stockholm. Telephone (08)

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volves the development, production, and marketing of digital telecommunications equipment in the United States. Also, under terms of an agreement with Sequent Computer Systems, Siemens has acquired the right to manufacture Sequent's Balance 8000 Parallel Processors.

As one of its major goals, Siemens has targeted the business sector and revitalized the 6.600 Series to compete in this market. Memory and disk capacities have been increased, as has workstation support. Now known as the 6.680-XS Series, the line consists of four upwardly-compatible models: 6.682-XS, 6.683-XS, 6.686-XS, and 6.687-XS. These models can operate in standalone mode or in a distributed processing environment with software specifically packaged for these purposes. The System 6.680-XS computers can capture, preprocess, and process data files, operating in either batch or interactive modes, and can access data files of larger host computers.

The 6.680-XS systems can handle commercial, technical, and scientific applications through different programming languages. Users can tailor the systems for use as:

- Autonomous, user-programmable workstation computers for data capture and interactive and batch data processing
- Components of a clustered arrangement, functioning as master stations capable of supporting up to 54 workstations and communicating with central computers

The entry level 6.682-XS is a multiworkstation, fixed disk model. Its basic configuration includes 512KB of main memory and a 33MB fixed disk drive. The system can be expanded to 2MB of main memory and 66MB of fixed disk storage.

The 6.683-XS is a multiterminal system capable of supporting a maximum of twelve terminals. It contains 512KB of main memory and one disk drive with a capacity of 66MB. It can be expanded to a maximum of 2MB of main memory and two 66MB fixed disk drives.

The 6.686-XS supports from one to eighteen terminals. The basic configuration contains 1MB of main memory and one disk drive with a capacity of 134MB. It can be expanded to a maximum of 4MB of main memory and two 134MB fixed disks.

The 6.687-XS is the most powerful System 6.680-XS model and can support a maximum of 54 terminals. Main memory ranges from 1MB to 8MB. Fixed disk storage capacity can reach up to 1GB.

Software support for the System 6.680-XS centers on the AMBOSS software system. AMBOSS contains the operating system; the MASK facility for screen formatting; utility programs for data manipulation, retrieval, and filing; and a database management system. The operating system within AMBOSS is modular and interrupt-driven. Only the supervisor module is permanently resident, and it calls the

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MODELS: 6.682-XS, 6.683-XS, 6.686-XS, and 6.687-XS.

DATE ANNOUNCED: April 1986.

DATE OF FIRST DELIVERY: June 1986.

NUMBER INSTALLED TO DATE: Over 2,400 of Siemens 6.000 Business Computers.

DATA FORMATS

BASIC UNIT: 8-bit byte, 16-bit word.

FIXED-POINT OPERANDS: 16 bits; optional arithmetic expansion for 32-bit fixed-point.

FLOATING-POINT OPERANDS: 32 or 64 bits for multiplication and division.

INSTRUCTIONS: Up to 338 instructions.

INTERNAL CODE: EBCDIC (Extended Binary Coded Decimal Interchange Code).

MAIN STORAGE

TYPE: NMOS—dynamic RAM.

CYCLE TIME: 450 ns.

CAPACITY: The 6.682 provides from 512KB to 2MB. The 6.683 provides from 1MB to 3MB. The 6.686 provides from 1MB to 4MB. The 6.687 provides from 1MB to 8MB.

CHECKING: A parity bit is generated with each byte during writing and checked during reading.

STORAGE PROTECTION: A programmable write-protection feature allows program-specific protection of main memory areas against overwriting.

CENTRAL PROCESSOR

The 6.682 and 6.683 use a Siemens ZE01 microprocessor. The 6.686 and 6.687 use a ZE03 microprocessor. The 6.687 also contains an 8KB cache for increased performance.

OPERATING ENVIRONMENT

Power requirements are 220 V ± 10 percent, 50 Hz +1/-2 percent.

The operating temperature ranges from 10 to 35 degrees C, with a noncondensing relative humidity of 20 to 80 percent. Optimal operating conditions are 15 to 30 degrees C, with a noncondensing relative humidity of 20 to 75 percent.

The peripheral operating conditions are as follows.

Printer: + 18 degrees to + 28 degrees C; 40 to 70 percent relative humidity.

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MAIN MODEL CHARACTERISTICS

	6.682	6.683	6.686	6.687
Main Memory:				
Minimum (MB)	0.5	1.0	1.0	1.0
Maximum (MB)	2.0	3.0	4.0	8.0
Diskette Drives (optional)	—	1	1	1
Fixed Disk Drives (maximum)	1	2	2	4
Streamer Tape Units	1	1	1	1
Workstations	3	12	18	54

other modules as required. AMBOSS supports four languages—Assembler, Basic, Cobol, and Fortran—for the development of user programs. All of the 6.680-XS models also support Siemens TRANSDATA 8150/8151 and IBM 3270 emulation software.

COMPETITIVE POSITION

Siemens regards the IBM System/36, IBM 8100 Information Processing System, and the Nixdorf 8860 as the main competition to the System 6.680-XS. In comparison with the IBM System/36, the high-end Siemens models offer larger maximum main memory and mass storage capacities, but the System/36 supports more workstations.

Distributed data processing is still popular in Europe, and it is in that market segment that the IBM 8100 challenges the 6.680-XS. Over the years, IBM has carefully monitored the development of the 8100, refining its communications capabilities and incorporating fault-tolerant options into the Model 8150 B. IBM maintains a strong presence in Europe, especially in France and the United Kingdom where Siemens does not market the 6.680-XS Series.

Other competitors who market distributed data processing systems on the same order as the 6.680-XS include Bull with a combination of the DPS 6, Questar workstations, and BlueGreen software, Ericsson with the System 2500, and ICL with the System 25 Plus.

None of these competitors, however, should underestimate the strength of Siemens in any market. The company has indicated that its overall strategy will center around vertical markets for which Siemens will offer total solutions of hardware and software in the same package. Siemens has implemented the "total solution" approach in the 6.680-XS. In addition, Siemens has targeted three growth areas: office automation, factory automation, and networking. Since the 6.680-XS falls into the office goals of this powerful competitor, rival vendors will not be able to rest on their laurels.

ADVANTAGES AND RESTRICTIONS

Versatile might serve as the best word to describe the Series 6.680-XS. Siemens has designed the series to function well in a variety of configurations, such as standalone, connected to a mainframe, and as a central unit in a clustered system. Although primarily intended for the office market,

Magnetic Tape Unit: + 15 degrees to + 32 degrees C; 30 to 65 percent relative humidity.

CONFIGURATION RULES

The 6.680-XS processing units combine the information-processing components, the central operating facilities, and the auxiliary features in one main cabinet. This cabinet contains the CPU, space for an integrated disk controller and the diskette and disk drives, a minimultiplexer, a control and indicator panel, and power supply.

The entry-level 6.682 has a basic main memory of 512KB, which can be expanded to 2MB. The basic system also contains one fixed disk with a 33MB disk and one workstation. Users can add two more workstations to the system.

In its basic configuration, the 6.683 comprises 1MB of main memory, one workstation, a disk controller, one 66MB fixed disk drive, and one streaming tape unit. The 6.683 can support a maximum of twelve workstations, up to 3MB of main memory, and an additional disk drive for a maximum total capacity of 132MB of fixed-disk memory.

The 6.686 contains 1MB of main memory, one workstation, a disk controller, and one 134MB fixed disk drive. It can support a maximum of 4MB of main memory, eighteen workstations, two disk drives, and a streaming tape unit.

The basic 6.687 configuration includes 1MB of main memory, one workstation, a disk drive controller, and one 134MB fixed disk drive. Expansion possibilities include a maximum of 8MB of main memory, 53 additional workstations, three additional disk drives, one 1MB diskette, and a streaming tape unit.

MASS STORAGE

6444 DISKETTE DRIVE: This diskette drive contains a controller and supplies a maximum storage capacity of 1MB per drive with an average access time of 173 ms. Recording occurs on 77 tracks, arranged with 26 sectors per track and 256 bytes per sector. The diskette rotates at 360 rpm. The unit can operate in an IBM/TRANSDATA format, 19 files maximum (equivalent to the IBM 3740 standard data exchange format).

6433 FIXED DISK DRIVE: This disk drive has a maximum capacity of 134MB and an average access time of 28 ms. Siemens provides the 6433 as a standard feature on the 6.686 and 6.687 configurations.

6425 FIXED DISK DRIVE: This disk drive has a maximum capacity of 33MB on one disk and an average access time of 53 ms. Siemens provides this unit as a standard feature on the 6.682 configuration.

6426 FIXED DISK DRIVE: This disk drive has a maximum capacity of 66MB and an average access time of 28 ms.

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TABLE 2: PERIPHERALS/TERMINALS

DEVICE	DESCRIPTION
6266 CRT/keyboard	2,000 characters; 25 lines of 80 characters; light green on bottle green or black on white; flicker-free character representation; 256 charcters formed in by 9 matrix (4.45 mm by 2.1 mm); normal and reverse video; international and German character sets; horizontal and vertical scrolling; I/O by character or block; roll-up operation; protected zones and table mode; detached keyboard with alphanumeric keys, function keys, and numeric pad
MAGNETIC TAPE EQUIPMENT	
6181	0.25-inch streamer tape; 60MB capacity; 90 ips-
6560	0.25-inch; PE/GCR adaptable; PE:1600 bpi, 30MB capacity; GCR: 6250 bpi, 150MB capacity
6561	0.25-inch; PE: 1600 bpi, 40MB capacity or NRZI/PE adaptable; NRZI: 800 bpi, 20MB capacity; PE: 1600 bpi 40MB capacity
PRINTERS	
6329-R	Matrix printer, 200/50 cps
6301 and 6311	Ink jet printer, 150 cps
6302	Matrix printer, 100/400 cps
6316	Drum printer, 445/600 lpm
6319	Ink jet printer, 270 cps

the system can also handle diverse applications in technical and scientific areas through the use of different programming languages.

Since Siemens markets a vast array of microcomputers, the company has ensured that the System 6.680-XS can interface with the PC-D, PC-D2, PC-MX, PC-MX2, and Sicomp PC 16. In this era of high microcomputer usage, the close attention paid by the company to microcomputer compatibility offers many advantages.

Although Siemens did not emphasize the distributed processing capabilities of the earlier 6.660 machines, the firm has now highlighted these features of the newer 6.680-XS offerings. Siemens is increasing its software communications options and now offers a file transfer facility, SINEC M SNFT, to allow data exchange with System 7.500/BS2000, System 7.800/MSP, and IBM/MVS.

The potential purchaser interested in an integrated office automation approach would do well to investigate not only the specific hardware, but also the software solution provided by Siemens in comparison with products from such vendors of integrated solutions as Bull, IBM, and ICL. In applications software, Siemens provides a wide range of offerings specifically adapted to the needs of small business users. □

Siemens supplies the 6426 as a standard feature on the 6.682 and 6.683 configurations.

The 6.680-XS Series also supports the following fixed/exchangeable and removable disk storage units.

6449 FIXED/EXCHANGEABLE DISK DRIVE: The 6449 has a maximum storage capacity of 13/13 or 39/13 or 66/13MB per drive, recording 512 bytes per sector and 32 sectors per track. It has an average access time with rotational delay of 38.33 ms, and the maximum transfer rate reaches 983 kilobytes per second.

6474 REMOVABLE DISK STORAGE UNIT: The 6474 is a disk pack drive with a capacity of 66MB or 250MB. Packs are divided into 808 cylinders and 15 spare cylinders. A cylinder consists of five or nineteen tracks, each track containing 32 sectors, each with 512 bytes.The 6474 has an average access time with rotational delay of 38.33 ms, and the maximum transfer rate reaches 983K bps.

INPUT/OUTPUT UNITS

See peripherals/terminals table.

COMMUNICATIONS CONTROL

For decentralized data processing, the System 6.680-XS offers synchronous and asynchronous line interfaces with transfer rates adjustable up to 64K bps.

6902 COUPLER UNIT: This device implements the coupling of 6.680-XS systems by means of an optical waveguide system up to 2,500 meters apart. Transmission occurs in a parallel manner with a maximum data transfer rate of 1.5M bps.

6903/6904/6905/6906 DATA TRANSMITTING UNITS: These unit allow the coupling of the 6.680-XS with each other at a distance, as well as the coupling to other computer systems. With the help of modems or data teleswitch devices, serial synchronous transmission of data proceeds at a transfer rate of 64K bps.

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The 6.680-XS computers perform telecommunications functions via synchronous data transmission modems. Bit-serial transmission occurs in accordance with the synchronous Basic Mode Procedures MSV1 and MSV2 (DIN 66019), BSC in the ISO 7-bit or the EBCDIC code, and HDLC/SDLC ISO/DIN.

SOFTWARE

Software for the System 6.680-XS resides in the AMBOSS 4 package.

AMBOSS 4 consists of supervisor, service program, library and file management system, screen formatter, monitor, relational database system, communications system, report writer, integrated text processor, and loader.

The *Supervisor* includes the Task Control Module, I/O Manager, Device Managment, and Elementary File Manager. The Task Control Manager controls and coordinates the execution of system software including allocating central processor time, swapping programs, processing calls, accounting for serviced programs, and controlling interprogram data and parameter transfer.

The I/O Manager controls and coordinates data transfer between programs and peripheral devices or telecommunications units. Device Management compensates for the differences in speed between peripheral devices and running programs. Elementary File Manager makes user programs independent of the physical structure (sectors, tracks) of storage media (such as disks).

The standard *Service Program* handles communication between the Supervisor and the user, accepting commands via a video terminal, validating them, sending them to the Supervisor for execution, and reporting the results back to the user.

The *Library Management System* accommodates the storage, administration, and manipulation of source programs, Basic language modules, and texts such as compiler listings.

The *File Management System* provides direct, sequential, and indexed sequential access to files. Its features include: administrative calls for creating or purging a file, opening or closing a file for processing, positioning a file, and administering catalog entries; central file catalog carrying essential information on all file management system files; protection against unauthorized or accidental alteration and deletion and also against unauthorized reading of data; and coordination of multiple accesses to a file.

The screen formatter, MASK, supports workstation communications via predefined screen forms. MASK's essential features of MASK are:

- Display of forms on video terminals.
- Special-purpose language for specifying forms.
- Operator prompting with visual and audible error indications, program-controlled cursor positioning, entry sequence control, verification of data input with regard to format and content (check sums, validity checks).
- Arithmetic operations on the entered data via special fields (accumulators).
- Capability of inserting fixed text and variable data on the screen by designating line and column coordinates.

With the help of MASK, the user specifies the processing of entered data and creates individual screen forms. After processing, the data can output in a prespecified format with accompanying messages. If desired, users can print out screen contents on a terminal printer.

The MASK language assists users in designing forms, specifying check procedures and arithmetic operations, and designing user program interfaces for post processing data. The MASK language allows description of:

- Compiler-parameters (e.g., data structure, screen capacity, etc.).
- Fixed text (which is automatically protected).
- Variable I/O fields (specification of mandatory fields where information must be provided as well as specification of "noncritical" optional fields).
- Error conditions and responses (errors can be signalled optically and acoustically and subroutines can be called).

In addition to the formatting language, MASK has features for compiling, storing, retrieving, and interpreting instructions. MASK also contains a teleprocessing monitor.

The batch *Monitor* is a control and supervisory program for automatically running batch programs from beginning to end. The Supervisor can administer several monitor sessions concurrently along with other programs, enabling multiprogramming to be performed in a batch operation.

Within a job, the Monitor assumes the tasks of loading programs, starting programs, deleting programs from supervisor accounting, releasing main memory and wait areas, servicing programs, processing status messages from programs, allocating devices, and monitoring elapsed time.

The *Loader* fetches programs for the supervisor and subsequently releases space that they have occupied. Its duties are:

- Loading programs into main memory and into peripheral storage
- Releasing space no longer required by programs
- Releasing space no longer required by common data
- Making entries in the supervisor's program accounting at load time
- Purging these entries when the programs are deleted

LANGUAGES: Users can run Assembler, Basic, Cobol, Fortran, and Extended Pascal on the 6.680-XS.

BASIC: Siemens' Commercial Basic supplies extensive functions for data input and output by way of the video display screen. Siemens offers a number of extensions to Basic:

- *Declare* statements for storage space reservation, defining of single or multiple line user options, and defining error exits
- *Processing* statements including shift and matrix operations, with the capability of executing some statements directly as desk calculator statements

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- *Input/Output* statements with facilities for file processing and formatted print output
- *INTEGER, REAL* (single and double precision), and *STRING* data types
- Standard options for mathematical functions as well as string, bit, and time functions
- *Arithmetic* comparison and logical operators, arithmetic and string expressions
- *Commands* for the interpreter with interactive options for program editing, management, testing, and file management

COBOL: The System 6.680-XS offers a version of ANS Cobol 74 that, in addition to the ANSI standard, offers features for interactive program debugging and for video input/output operations. The Cobol compiler requires about 40KB of main memory.

FORTRAN: The Fortran compiler processes the full scope of the Fortran IV language plus the following extensions:

- Extended field indexing, loop control, and format keys
- Input from fields and output into fields defined in the program via DECODE and ENCODE
- Special option for calling standard subroutines via EXECUTE
- Definition of bit patterns, decimal constants, and character strings
- Shift and masking operations (including exclusive OR) on bit patterns
- Internal functions for logically combining and shifting bit patterns
- Direct access to system information using internal functions

UTILITY PROGRAMS: Siemens offers a wide selection of utility packages with the 6.680-XS computers. These include:

- Programs for initializing and formatting diskettes and cassettes. INIT initializes a diskette in IBM EBCDIC format. DCONVA converts a diskette from EBCDIC to ASCII format.
- Programs for adjusting, renaming, and deleting data. RESCUE, under certain conditions, saves a file that has been deleted with DELETE. ALIAS assigns a file multiple names by which it can be accessed. Siemens also offers copy programs for physically copying diskettes and tape cartridges.

Siemens has introduced the SINEC M SNFT file transfer system to allow data transfer between 6.680 systems and System 7.500/BS2000, System 7.800/MSP, and IBM/MVS.

APPLICATIONS SOFTWARE

Siemens offers user programs for the 6.680-XS business computer models for most applications. Contact Siemens directly for additional details.

PRICING

The following are typical configurations and their prices.

A 6.682 Business Computer with 512KB of memory, VDU station, 33MB fixed disk, and 150-cps printer costs about DM 22.000.

A 6.683 Business Computer with 1MB of memory, two VDUs, 66MB fixed disk, diskette drive, and 160-cps printer costs about DM 75.000.

A 6.686 Business Computer with 1MB of memory, four VDUs, 134MB fixed disk, and 200 cps printer costs DM 125.000.

A 6.687 Business Computer with 1MB of memory, 16 VDUs, 134MB disk, and 600-lpm printer costs approximately DM 260.000. ■