

Siemens System 7.500

NEW PRODUCT ANNOUNCEMENT

At the Hanover Fair in April 1979, Siemens announced a new compact computer, called the System 7.500, which will compete with IBM's 4300 series. There are three models, two aimed at the small to medium sized business market (office computers) and the third at larger computer centers. Designed to handle on-line interactive, teleprocessing and batch applications, the 7.500 series is completely compatible with the Siemens System 7.700 series. The CPU read cycle time varies from 380ns/8 bytes on the 7.521 to 200ns/8 bytes on the 7.541. Memory sizes, based on MOS/LSI technology, vary from 512K bytes on the model 7.521 to four megabytes on the model 7.541. Basic CPU prices vary from DM 158,120 for the model 7.521 to DM 682,500 for the model 7.541. On-line disk storage capacity ranges from 1680 megabyte on the 7.521 to 2500 megabytes on the 7.531.

Siemens intends to market the System 7.500 in Germany, France, Italy, Benelux, Denmark, Austria, Sweden and Spain as well as in the eastern block countries and South Africa.

The first model to be delivered should be the model 7.531 towards the end of 1979. The other two models are scheduled for delivery in about April 1980.

The system has been designed to make it "user friendly" for non-specialist staff and includes at no extra charge a training package called "Teachware" for system operators.

All three systems run only under the BS 2000 virtual memory operating system, which is also used on the Siemens' System 7.700. The release for the System 7.500 has been designed so that it can be tailored to meet the exact requirements of the configuration ordered. BS 2000 supports both remote and local batch applications and the more complex dialogue-oriented interactive applications.

Compilers are available for COBOL, FORTRAN, PL/1, SPL, BASIC, APL, ALGOL and RPG2. Programs can also be written in Assembler.

Siemens provides data security by locking the CPU peripherals and terminals with a keyboard switch. Operators must identify themselves with their ID key. Memory is automatically protected, and unauthorized access and modification of the contents in the memory is prevented through the security system.

A distinction must be made between the lower-end models, the 7.521 and 7.531, which are competitive with IBM's 4331, and the 7.541, which is competitive with IBM's 4341. The 7.521 and 7.531 are intended to be used in a "normal" office environment without special air conditioning facilities while the 7.541 is a physically larger computer intended to be used in a computer center.

The basic configuration of the model 7.521 is the CPU with 512K bytes of memory; a console keyboard/display; one floppy disk drive for system Initial Program Load (IPL) and for operation without punch cards; and one 300 lines per minute printer.

The basic configuration of the model 7.531 includes the CPU with 512K bytes of memory; a console display; one user station (a data display terminal enabling interactive processing or data entry); shared keyboard for both displays; one floppy disk drive for IPL and for operations without punch cards; Integrated Terminal Controller (ITC), Integrated Direct Disk Storage Adapter (DDSA), and one drum printer with a capacity of 600 lines per minute.

The basic configuration of the model 7.541 contains the CPU; a 16K-byte cache memory; 2 megabytes of main memory; an operator console with video terminal and console printer; a service processor with floppy disk drive for systems applications; a printer (600 lines per minute) including system interface adaptor; and two block multiplexer channels with trunks for the operator console and the printer plus a further six trunks.

The System 7.500 is modular in design and the memory size of each model can be expanded. The 7.521 memory can be expanded from 512K bytes to 1024K bytes; the 7.531 memory can be expanded to 1536K bytes. The main memory of the 7.541 can be expanded from the basic 2 megabytes to a maximum of 4 megabytes. Depending on the system, other options can be added. These are explained in more detail below. ➤

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- The CPUs of the models 7.531 and 7.541 contain a cache memory of 8K bytes and 16K bytes, respectively. This facility permits a considerable reduction in access time to those instructions and data which are buffered in the cache.

The central processor of the model 7.531 contains 1024 words of read-only memory (ROM) to hold the instruction set. Some of the main processor features are automatic error detection and correction; floating point arithmetic with single, double, and extended precision; interval timer, elapsed-time clock, time of day clock, three program timers, dynamic address translation, automatic instruction retry, and memory protection. The CPU has four processor states: the processing state, the interrupt response state, interact control state and the machine condition state.

The central processor of the model 7.541 comprises two logically independent processors; an Instruction processor and an Execution processor. The first performs instruction prefetch, interprets instruction steps and calculates operand addresses; the latter actually executes instructions. The CPU is controlled together with the I/O system by microprograms which are contained in the writable control memory (capacity of 60KB) and communicate with each other and with the main memory via a co-ordinator unit. The writable control memory is loaded via a floppy disk drive mounted in the CPU.

The 7.541 also contains a central operator console, which the other two models do not have, and through which the operator-system dialogue is handled. The central operator console has a video terminal, keyboard, console printer and control panel. An integral part of the central operator console is the service processor (SVP) which is a microprocessor with its own 65K bytes of main memory. The functions of the SVP, which is connected to the central processor, are the execution control of the maintenance and diagnostic routines, the reporting and automatic correction of machine errors, and the monitoring of the initial microprogram load.

Regarding the models 7.521 and 7.531, the main peripheral units are attached via the Input/Output processor, which is attached to the co-ordinator of the central processing unit. The heart of the I/O processor is a microprocessor which monitors the byte multiplexer channel and the direct disk storage adapter. The byte multiplexer channel can have the following peripheral units attached to it: magnetic tape units with controller, train printers, card readers, card punches, and floppy disk I/O units. The byte multiplexer channel has a capacity of three trunks for the 7.521 and five trunks for the 7.531. The printer is also attached to the byte multiplexer channel. The units, which are attached to the individual byte multiplexer channel trunks, can operate and transfer data concurrently as long as it is within the total data rate. The disk storage drives connect to the direct disk storage adapter. The total number of disk drives, which can be attached, is four on the 7.521 and six on the 7.531. The data rate of the direct disk storage adapter is 806K bytes per second.

The I/O system of the model 7.541 has one byte multiplexer channel and up to five block multiplexer channels which can operate in both the block multiplex mode and the selector mode. Byte multiplexer channels allow the addressing of up to 256 units which can operate concurrently in the time division multiplex mode. The byte multiplexer channel can have an additional eight trunks. Subchannel registers for the byte multiplexer channels and the block multiplexer channels are located in a reserved section of main memory called the shadow memory, which is not available to the user. The memory size depends on the channel configuration.

There are three exchangeable disk drive models with storage capacities of 63; 126; and 300 megabytes, respectively, and an average access time of 37.5 ms. The fixed disk storage unit available has a capacity of 420 megabytes and an average access time of 40.5 ms.

The magnetic tape units (800 or 1600 bpi) read/write speeds vary from 20K to 80K bytes per second depending on model and density used. Units consisting of two drives, with a recording density of 1600 bpi and read/write speeds of 30 to 60K bytes per second can be attached only to the models 7.531 and 7.541. These two-drive units can be expanded by means of single tape units which have the same read/write rate. ➤

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- ▷ Regarding printers, there are three models available with speeds ranging from 300 to 1480 lines per minute depending on model and character set used. The normal 64-character set used is in the OCR-B font. For the model 7.521, one may choose from two printers: the 300 lpm or the 600 lpm. The high speed printer is only available for the 7.531 or 7.541. On the model 7.541, the 600 lpm printer may be replaced by a 1200 lpm printer, a 2000 lpm printer, or Siemens' laser printer and would be connected via the system interface adapter.

Card readers (80-column cards) with a reading rate of 660 or 1000 cards per minute and card punches operating between 100 and 300 cards per minute are available. There is also a 90-column card option.

The "magazine" Floppy Disk I/O unit comprises either one or two stations with hopper and a stacker. Each can hold up to 20 floppy disks. A standard floppy disk drive (256K bytes floppy disk) can also be attached to the 7.541.

Data display terminals and/or printer terminals can be attached to all systems. The models 7.521 and 7.531 can have up to four data display terminals and three printer terminals connected. Two data display terminal models, the 8160 and the 8162, are available. The 8160 has a character set of 64 or 95 characters while the 8162 has a set of 190 characters. Display format is 80 characters by 24 lines.

System 7.500 software tools, application software packages, and the database management tools are priced separately. The Universal Transaction Monitor (UTM) assists users in getting familiar with transaction processing techniques. This facility covers the functions of programs management, message communication, storage management, log file, transaction control, and integrated format control. Other tools available to facilitate software development and maintenance are BYBLOS (design and documentation), COLUMBUS (structured programming), TESTMANAGER and MMS (test and measurement), FMS and DAVID (file management), COTUNE and FORTUNE (program run analysis), GPSP (macroprocessor), FORM PLACE (editing and checking terminal input), and DOCULITY (text editing).

For the System 7.500, existing data management systems such as the Universal Database Management System (UDS) and SESAM have been provided in a "compact" release. UDS simplifies system operation by handling routine data management tasks, including construction of databases. The major components of UDS are the Data Definition Language (DDL), the Storage Structure Language, the Database Handler, the Data Manipulation Language, the Interactive Query Language, and service programs. SESAM assists mainly with interactive procedures and processing.

A wide range of applications packages is also available on the System 7.500 for general commercial applications such as accounting, personnel management, purchasing, warehousing, order processing, manufacturing, and basic data management. Other packages include DIFIB (interactive accounting), COMET (a system for corporate decision-making), ISI (industrial planning and control), TRAFIC (transport optimization and vehicle fleet scheduling), SINET (interactive system for network analysis), GPSS and SICOS (simulation of models with discrete and continuous operations), and METHAPLAN (methods base).

The system provides for teleprocessing applications. For short distances (up to 2km) teleprocessing, the model 7.531 contains as standard an Integrated Terminal Controller (ITC). This is an optional feature on the model 7.521. In the case of both short and long haul processing, the ITC is replaced by an Integrated Front-End Processor (IFEP).

Using the ITC, the number of simultaneous terminals that can be connected varies from 16 on the model 7.521 to 32 on the model 7.531. The IFEP supports one long distance line and the same number of local terminals as the ITC. The number of local connections available is considerably reduced when additional long distance lines are added. The IFEP for the model 7.531 permits up to 11 remote connections. If more remote connections are needed, a front-end processor can be added. An IFEP can support the full range of TRANSDATA terminal subsystems, which facilitate teleprocessing applications. ▷

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➤ Teleprocessing on the model 7.541, on the other hand, is handled via the 8170 multipurpose controller, as on the system 7.700.

Summary Table

Model	7.521	7.531	7.541
Planned delivery date	April 1980	November 1979	April 1980
Memory sizes (min.) (max.)	512K bytes 1024K bytes	512K bytes 1536K bytes	2 megabytes 4 megabytes
CPU Read cycle speed	380ns/8 bytes	250ns/8 bytes	200ns/8 bytes
Purchase price	DM 158,120	DM 181,740	DM 682,500
Monthly rental on a 3-year contract	DM 4,080	DM 4,660	DM 17,500
Monthly maintenance contract	DM 720	DM 830	DM 1,980