IBM 4300 Series

The IBM 3422 magnetic tape subsystem is a 10½-inch unit that can read or record data at selectable speeds of 1600 and 6250 bits per inch (bpi). It operates at 125 inches per second (ips) and has autothread/autoload capabilities. Data transfer rates are 200KB per second at 1600 bpi and 780KB per second at 6250 bpi. Three options are available: a data-streaming feature that allows a channel transfer rate of either 2MB or 3MB per second; a two-channel switch, which allows the 3422 to be addressed by two separate I/O channels; and a communicator, which connects two control units and allows either controller to address up to 16 tape units.

The 3812 page printer is a tabletop nonimpact page printer that uses Light-Emitting Diode (LED) printhead technology. The 3812 has no moving parts. It delivers letter-quality print, text, and all-points-addressable graphics at speeds up to 12 pages per minute. It has a print resolution of 240 by 240 dots per inch and supports merged text and graphics printing. The 3812 can be connected to VM hosts through an IBM 3705 or 3725 communications controller or through the Communications Adapter of the 4361 processor, using an RS-232-C bisync line, the 3812's bisynchronous communications feature, and a support program called Pageprinter VM Support.

On the price front, IBM has increased monthly lease/rental charges for most machines, including features and Requests for Price Quotation (RPQs), by approximately 8 percent. Minimum maintenance charges, additional maintenance and additional monthly maintenance charge rates, monthly use charge rates, warranty option charges, and central facility maintenance service monthly charges have also been increased by the same percentage for selected machines, features, and RPQs. IBM National Service Division hourly (per-call) service rates have been increased by approximately 15 percent. The company has also increased monthly license charges, initial license charges, and one-time charges for the basic license and Distributed Systems License Option (DSLO) of selected licensed programs.

All 4300 Series processors offer full System/370 compatibility. They can operate in System/370-compatible mode or in an extended control program support (ECPS) mode; the 4381 processors, as mentioned previously, can operate in System/370-XA mode, which provides compatibility with larger systems. ECPS mode is designed to take full advantage of the extensive microcoding available in these machines to reduce operating system overhead and improve system throughput.

According to IBM, the 4361 processors are particularly suited for commercial, office, and interactive problem solving, and for engineering/scientific applications. The 4361 incorporates separate instruction and I/O processing units to enhance system throughput. The 4361 Model Group 3 can have up to three optional I/O channels. The Model Group 4 comes equipped with one standard channel, with five additional channels available as options. On the Model Group 5, three I/O channels are standard and an additional three are optional. The 4361 Model Group 3 can be field upgraded to a Model Group 4 or 5, and the Model Group 4 can be upgraded to a Model Group 5.

Microcode is loaded through the system diskette drive. The several diskettes supplied with the system contain field engineering diagnostics, basic system features, and optional system features selected by the user. The system diskette facility also allows storage of failure data from the 4300 Series processors. This data can be subsequently analyzed by field engineering for maintenance purposes.

The no-charge Problem Analysis Feature allows 4381 users to identify valid hardware problems as the cause of system interruptions. Screen-prompted instructions lead the user through the steps required to solve the problem. Using the Remote Support Facility, service information can be sent to and received from IBM Field Engineering. The Remote Operator Console Facility (ROCF) is used to run a subset of Problem Analysis from the user installation.

The 4361 comes equipped with a Problem Finder Facility, a hardware diagnostic tool invoked by the customer. Detailed information on machine failures, suspected hardware problem sources, and the need for a service call are communicated to the customer.

Also available for the 4361 is an optional Auto Start feature that provides for preprogrammed and remote system power-on. With this feature, the system can be automatically powered on at a predetermined time and day of the week, or it can be started up remotely via the ROCF. The 4361 processors also include a programmable power-off function as a standard feature.

The 4381 features an 8-byte (64-bit)-wide data flow within the processor, as well as an 8-byte-wide data flow among the processor, storage, and channels. Data flow within the 4361 ranges from 4 to 8 bytes wide.

On the 4361, the mode of operation is selected at initial program load (IPL) time; on the 4381, at initial microcode load (IML) time. One operating mode is the Extended Control Program Support (ECPS:VSE) mode, which utilizes the extensive microcoding facilities of the 4300 to reduce DOS/VSE or SSX/VSE overhead and improve system throughput. Another operating mode, 370 mode, has three options on the 4361. On the 4361, the Basic Control (BC) option provides for execution of System/360 programs, the Extended Control (EC) option provides for execution of programs that require dynamic address translation facilities, and the ECPS:VM/370 option provides improved system performance with VM/370.

Two modes of operation are supported on the 4381: 370 mode and 370-XA mode. When the 4381 is operating in 370 mode, support is provided by MVS/SP-JES2 or MVS/SP-JES3, VM/SP, DOS/VSE with VSE/AF, and OS/VS1 with Basic Programming Extensions. When operating in 370-XA mode, the 4381 will support MVS/SP-JES2 and MVS/SP-JES3 and the VM/XA Migration Aid. The Start Interpretive Execution (SIE) assist reportedly provides improved performance for V=R preferred guests under the Virtual Machine/Extended Architecture (VM/XA) Systems Facility.

With ECPS:VSE, a reduction of up to 20 percent of total CPU time has been measured by IBM when compared with the same version of DOS/VSE running in a typical DB/DC environment without ECPS:VSE. Likewise, with ECPS:VS1, a reduction of up to 7 percent of CPU busy time for the OS/VS1 supervisor has been measured by IBM when compared to the same version of OS/VS1 without ECPS:VS1. With ECPS:VM/370, a reduction of up to 84 percent of CPU busy time for the VM/370 control program has been measured by IBM when compared to the same version of VM/370 running without ECPS:VM/370.

IBM 4300 Series

TABLE 2. MASS STORAGE

MODEL	3310	3350	3370
Cabinets per subsystem	4 to 32	8 to 32	16 to 32
Disk packs/HDAs per cabinet	1 or 2	2 HDAs	1 HDA
Capacity	64.5MB or 129MB	317.5MB per HDA	571.3MB or 729.8MB
Tracks/segments per drive unit	358 tracks; 126,016 sectors	16,650 tracks	—
Average seek time, msec.	27	25	19
Average access time, msec.	36.6	33.4	29.1
Average rotational delay, msec.	9.6	8.4	10.1
Data transfer rate	1.03MB/sec.	1.2MB/sec.	1.86MB/sec.
Controller model	Integrated	3830-2 or 3880-1, -2, or -21	3880-1, -2, or -4
Comments	Model A2 includes 2 drives and supports up to 2 more. For use on the 4361 only.	Fixed head models available; Model A2 includes logic and power for up to three B2s, or two B2s and one C2 unit.	Model A units include logic and power for up to three B units.

TABLE 2. MASS STORAGE (Continued)

MODEL	3375	3380 Models A4, AA4, B4	3380 Models AD4, BD4	3380 Models AE4, BE4
Cabinets per subsystem	16 to 32	8 to 16	8 to 16	8 to 16
Disk packs/HDAs per cabinet	1 HDA	2 HDAs	2 HDAs	2 HDAs
Capacity	819.7MB	1260MB per HDA	1260MB per HDA	2520MB per HDA
Tracks/segments per drive unit	—	—	—	—
Average seek time, msec.	19	16	15	17
Average access time, msec.	29.1	24.3	23.3	25.3
Average rotational delay, msec.	10.1	8.3	8.3	8.3
Data transfer rate	1.86MB/sec.	3MB/sec.	3MB/sec.	3MB/sec.
Controller model	3880-1, 2, or 4	3880-2, -3, or -23 (-23 for AA4 & B4 only)	3880-3 or -23	3880-3 or -23
Comments	Model A1 includes logic and power for up to three B1s or two B1s and one D1.	Strings headed by Model AA4 can intermix with strings headed by Models AD4 and AE4.	Model AD4 can control up to three BD4 or BE4 drives.	Model AE4 can control up to three BD4 or BE4 drives.

All 4361 models support the Work Station Adapter (WSA) and the Serial OEM Interface (SOEMI), both of which increase the flexibility of 4361 configurations. The WSA, optional on all models, permits direct attachment of up to 32 peripheral devices and intelligent workstations through the 3299 Terminal Multiplexer. The SOEMI, which is standard on all 4361 Display/Printer Adapters and Work Station Adapters, permits the connection of OEM devices from various manufacturers, including equipment for such applications as robotics, process control, and voice response/recognition. The 4361 processors also include Auto Start and Programmable Power-Off features.

The 4300 Series processors allow attachment of most peripheral devices supported by IBM's System/370 and 303X, 308X, and 3090 Series computers, including 3310 (4361 only), 3350, 3370, 3375, and 3380 Direct Access Storage Devices; the 3830 and 3880 Storage Control Devices; the 3410/3411, 3420, 3430, 3480, and 8809 (4361 only) Magnetic Tape Units; and the 4245, 4248, and 3820 Printers.

All 4300 Series processors require a 3278-2A or 3205 display console as an operator console. Up to three additional consoles or 3287 Printers (for a total of four devices) can be attached to the 4381 processors. The Display/Printer Adapter on the 4361 processors can accommodate as many as 15 additional display units or printers. With the

The 4361 employs three independent processors: the instruction processor, the input/output processor, and the service processor. The instruction processor includes a high-speed cache buffer, a three-port local store, high-speed instruction processing, a 370 instruction buffer, a floating-point multiply unit, an arithmetic and logic unit, a function control element, and control storage. The input/output processor includes a separate channel processor for independent I/O processing, a data mover buffer, and channels for control unit attachment and integrated I/O adapters. The service processor includes the Problem Finder Facility for detecting and recording recoverable errors, the Remote Operator Console Facility (ROCF), the Remote Service Facility for problem diagnosis performed away from the 4361, and controls for dual diskette drives and system console attachment.

The 4381 consists of four separate functional units: a memory subsystem, an instruction processing unit, a channel subsystem, and a maintenance subsystem. The memory subsystem features main storage, a high-speed buffer, a swap buffer, and a memory control unit. The instruction processing unit includes a shifter (to and from memory), a storage address register, an arithmetic logic unit, local storage, control storage, and an instruction buffer; it also includes a high-speed hardware multiplier in 4381 Model Groups 12, 13, and 14. The channel subsystem includes channel data buffers, a channel operation unit, and standard and optional channels. The maintenance subsystem includes a service processor, a service panel, a power-up microprocessor, a direct console attachment, diskette drives, a modem (which connects to the Remote Operator Console Facility and the Remote Service Facility), a direct instruction processor link, and a channel link for operator consoles.