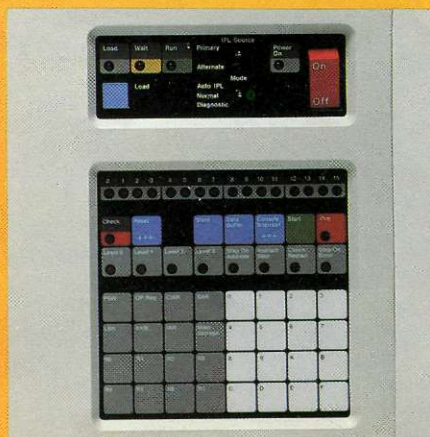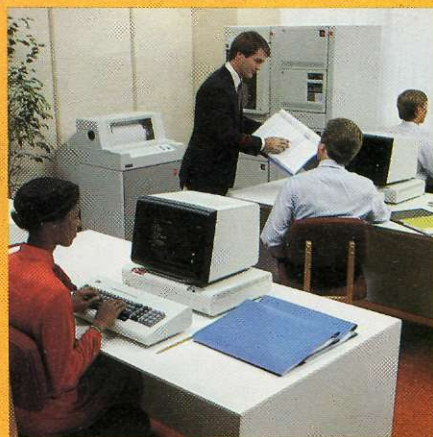# Series/1

Equipment modules: Choose from over 50 features to match system performance to system needs

IBM

Build your kind of System from a remarkable variety of low-cost hardware

IBM Series/1 is a unique combination of low-cost, modular components. You select just those units that meet your present needs. You can easily change or add units at any time as your needs change.

You have a wide variety of powerful equipment units to choose from: processors … fixed and removable storage media … fast and efficient input/output attachments … plus attachment features that allow you to use non-IBM terminals and equipment such as plotters, Teletype* units and terminals.

Advanced technology

In both hardware and software, your Series/1 benefits from some of IBM's most advanced technology. Both logic and main memory circuits are fast, small and reliable. These circuits pack extra computing and storage capacity on a few pluggable circuit cards that increase reliability, system availability and ease of servicing.

Series/1 16-bit architecture is designed to speed response, make the system adaptable to a variety of requirements and make input/output devices easy to add or change.

A unique cycle-steal channel interleaves I/O operations with processing to handle data at speeds up to 1.6 megabytes per second. Up to 256 devices are individually addressable. Many of these attached devices are controlled by their own microprocessors, reducing the channel loading on the main processor.
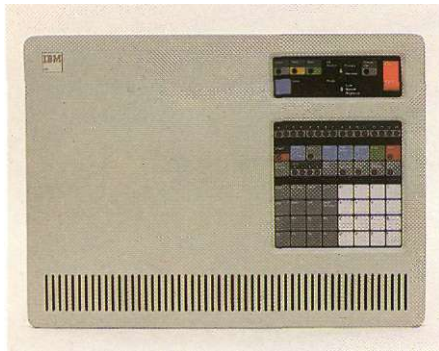
I/O devices are attached to the main processor through I/O feature cards that plug into the processor or an additional I/O Expansion Unit.

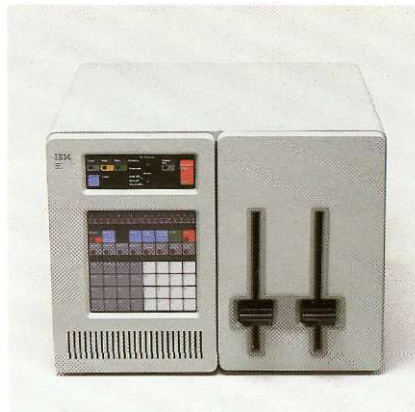### A tailored approach to software

Series/1 software consists of an extensive array of systems programs and program-support tools. Programmers can select and implement only those functions required to meet their application needs. For example, you can choose from two operating systems: The Realtime Programming System or the Event Driven Executive. Both are intended for interactive multiterminals, multitasking and multiprogramming as well as batch applications. A group of Control Program Support programs is also available for those who wish to develop applications with a tailored control program.

The Series/1 software support for communications is designed to meet a broad range of requirements. Also a number of program aids is available for earlier program development as well as for unique system requirements.
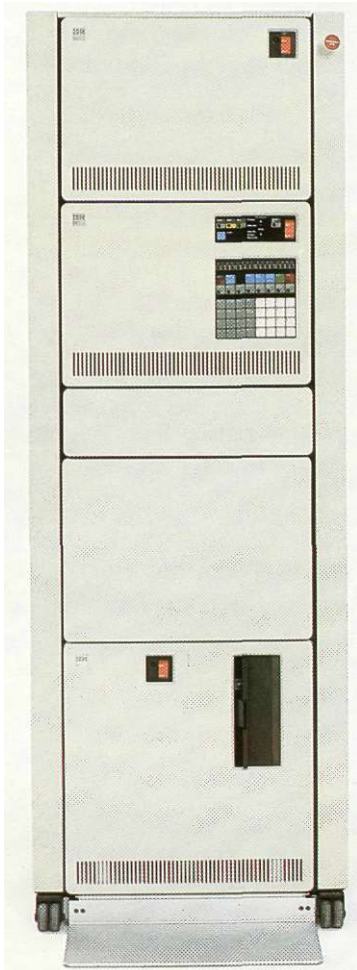

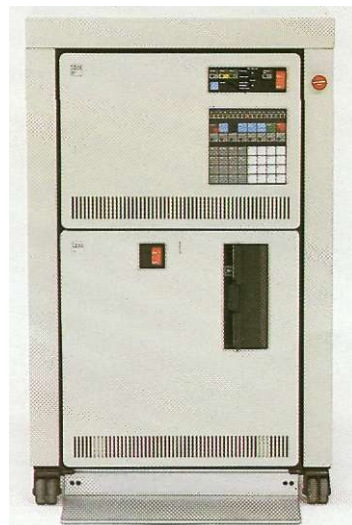
*Registered Trademark Teletype Corp.

4954 model B Processor

4952 model C Processor

Larger Series/1 configuration

Small Series/1 configuration

Three processors come in 10 models with optional features

4952 Processor

A low-cost, entry-level processor that combines CPU and 32KB to 128KB of main storage and a native timer in a single circuit card. Available in three models, it provides:
. 179 instructions
• Instruction time of 9.3 microseconds, average
. Storage cycle of 2.1 microseconds
. Channel data rate of 832KB/sec. (max)
. Clock comparator
. Optional integrated diskette unit (model C)

4954 Processor

A mid-range processor, available in three models, with internal performance approximately twice that of the 4952, it provides:
• 179 Instructions
• Instruction time of 4.5 microseconds average
• Storage cycle of 1.4 microseconds
. Channel data rate of 1.33 MB/sec. (max)
• Storage of 64KB to 256KB
• Clock/comparator
• Optional integrated diskette unit (model C).

4955 Processor

This high-performance, full-function processor is available in four models with internal performance approximately 3.0 to 3.5 times that of the 4952. It provides:
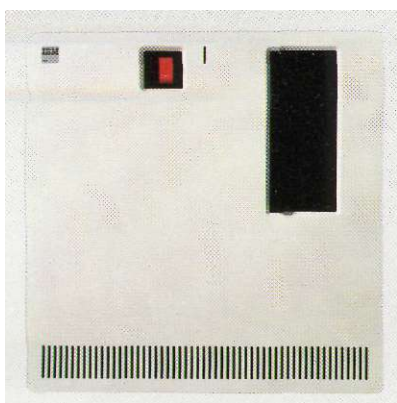• 1 77 instructions
• Storage of 32KB to 512KB
• Instruction time of 2.65 microseconds, average
• Storage cycle of 660 nanoseconds
• Channel data rate of 1.6MB/sec. (max)
• Storage protect.

Standard processor features:
• 4 priority interrupt levels
• 8 general-purpose registers per level
• Direct addressing of 256 devices
• Comprehensive error checking/ reporting
• Power failure detect/auto-restart
• Mountable in IBM or EIA standard 19" rack enclosures.

Optional features:
• Storage Address Relocation Translator to permit addressing storage over 64KB (4955 model D only)
. Floating point provides 30 additional instructions and 16 64-bit registers (4954 and 4955 only)
• Programmer Console to aid testing and debugging.

4962 Disk Storage Unit

4964 Diskette Unit

4965 Diskette Drive
and I/O Expansion Unit

4969 Magnetic Tape Subsystem

Three types of auxiliary storage

With Series/1, you can choose from a variety of I/O units that offer disk, diskette, or magnetic tape storage devices.

4962 Disk Storage Unit

This is a sealed, non-removable magnetic disk protected from dust and dirt and operator mishandling. Capacity: 9.3 or 13.9MB. Access time: 40 milliseconds, average. Several models are available, including a combination disk/diskette unit. A fixed head option on two models allows high speed scan to frequently used data.
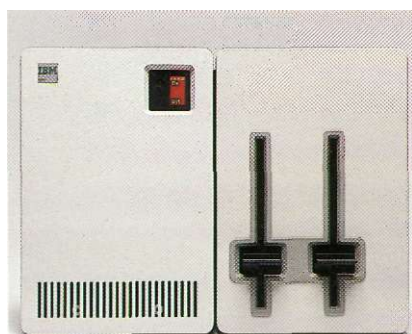
4963 Disk Subsystem

Eight models are available, with capacities from 23 to 64MB. With one primary and up to three expansion units, each 4963 can contain a total of 258MB of online storage. Access time: 27 milliseconds, average. A subsystem microprocessor frees the main processor from external data handling chores. Additional disk subsystems can be attached to a Series/1.

4964 Diskette Unit

This unit contains a removable, flexible diskette that can be used to load programs or transfer data into the Series/1 or to other IBM diskette devices. Capacity: up to 606KB. Access time: 40 milliseconds, track to track.

4965 Diskette Drive and I/O Expansion Unit

Provides one or two diskette drives allowing for 1.2 or 2.4MB of diskette storage. The unit also contains space for 4 additional I/O cards.

4966 Diskette Magazine Unit

This unit contains two diskette magazines—each with up to 10 diskettes-plus slots for three individual diskettes. At double density recording, each diskette can hold up to 1.2MB. Magazine capacity: 27.8MB. An effective data file backup for most data sets.

4969 Magnetic Tape Subsystem

This is a family of high-performance magnetic tape drives for load dumps, data interchange, archiving, journaling and similar applications. The 4969 offers a range of speeds: 45 and 75 IPS, at densities of 800 BPI, 1600 BPI or both. Up to four drives are available on a single subsystem.

3101 Display Terminal

4978 Display Station

4979 Display Station

5251 Display Station

Versatile display units for online computing

Series/1 gives you freedom to match displays to the needs of your problems. You can easily change them as your needs change. Each device is controlled by its own external microprocessor contained on an I/O feature card that plugs into the CPU I/O channel.
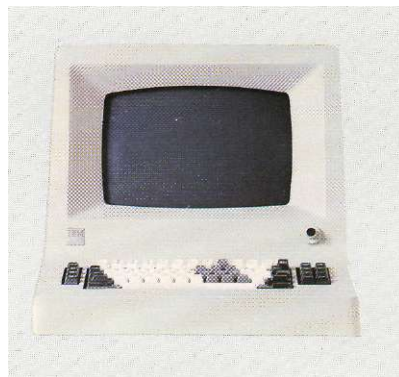
3101 Display Terminal
This tabletop display terminal consists of a keyboard with 87-keys and a 305mm (1 2 inch), 2000-character screen. Operator productivity features include facilities for trouble determination and replacement of workstation elements for increased availability.

4978 Display Station
This tabletop display and separate keyboard permits use of multiple keyboard codes. It provides a cursor, scrolling and format control on a 1920-character screen.
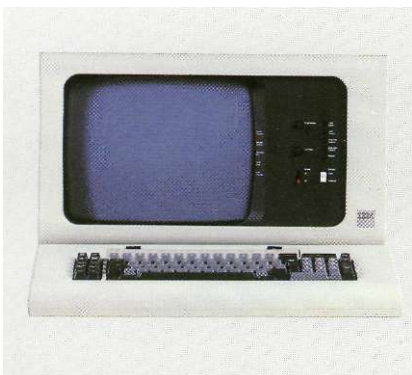
4979 Display Station
This is a combination tabletop display and a keyboard with 66-keys, cursor and format control on a 1920-character screen.

5251 and 5252 Display Stations
On these advanced function display stations, the keyboard includes 52 alphabetic, 10 numeric and 34 special characters. Models available include a 960-character screen and a 1920-character screen. The 5252 provides two workstations, each with a 960-character screen. The 5251 and 5252 are supported by the Realtime Programming System.

3102 Printer

Printers in a range of speeds and features

3102 Printer

This desk top general purpose, receive-only thermal printer attaches to a 3101 display terminal (not directly to the Series/1). The 31 02 is buffered and can print at 40 characters per second. It provides hard copy of the contents of the 31 01 screen either on a continuous basis, or upon commands from the host or the 3101 keyboard.

4973 Line Printer

4973 Line Printer

This free-standing impact-type printer prepares up to 132-character lines at six or eight lines per inch. Two models have print speeds from 80 to 414 lines per minute … their own micro-processor control . . . and 48-, 64- or 96-character interchangeable print belts.

4974 Matrix Printer

This tabletop printer has a wire-matrix print head. It prints a 132-character line at six or eight lines per inch. Speed is 1 20 characters per second, bidirectional.

4975 Matrix Printer

4975 Matrix Printer

Two models of this tabletop printer provide print speeds of 40 to 1 20cps. Both local and remote models are available. Choice of draft or text mode.

5256 Matrix Printer

This tabletop printer has a wire-matrix print head. It provides bidirectional serial printing and is fully buffered. Other features include: 96-character set… horizontal spacing of 10 characters per line at six or eight lines per inch, vertical… speeds of 40, 80, 120 characters/sec. This device is supported by the Realtime Programming System.

5256 Matrix Printer

System support to add application versatility

4959 Input/Output Unit
An optional channel extension with space for 1 4 additional I/O cards, the 4959 makes it possible to switch devices between primary and secondary processors. Multiple 4959s can be used on a single system.

4982 Sensor Input/Output Unit
The 4982 provides for attachment of up to eight I/O feature cards in a half-width unit, for digital and/or analog sensor devices.

4993   Series/1...System/370 Termination Enclosure
The 4993 provides physical support and mechanical connection of a Series/1 and electrical termination to a System/370, 4300 or 303X channel.

4997 Rack Enclosure
Two sizes are available: 1.0 meter high (39.37 inches) for two full-width units … or 1.8 meters high (70.9 inches) for four full-width units. A rack-mounting feature permits mounting half-width units.

4999 Battery Backup Unit
The 4999 provides automatic cutover to a battery-driven power supply if utility power fails (4955 and 4952/4954 models A and B only).

User Attachment Cards
These feature cards are available for equipment listed below. They plug into the processor or I/O Expansion Unit and are well documented to facilitate attachment of non-IBM equipment:
- Teletypewriter Adapter for Teletype* 33/35 or equivalent device. The adapter operates in full-duplex mode at speeds up to 9600 BPS.
- Integrated Digital I/O provides 32 points of digital input and 32 points of digital output.
- Timers provide time of day to the operating system and can be used to measure pulse duration or as pulse timers. Two 1 6-bit timers per card and five frequency options per timer are available. Timers operate under direct program control.
- Customer Direct Program Control Adapter permits attachment of up to 16 addressable customer devices, with interrupt capability. It provides a parity option and 16-bit parallel input and output data transfers.
- Channel Socket Adapter provides an IBM printed circuit card for a standard connector. This is for those who wish to build an attachment that utilizes full cycle-steal and IPL channel capability.
- General Purpose Interface Business Adapter provides an interface for OEM devices that meet IEEE Standard 488.

Communications for use with terminals or computers

Series/1 communications features are designed to meet a broad range of requirements for connecting the Series/1 with a variety of terminals and host systems.

Local Communications Controller

This card provides the basis for connecting multiple Series/1s in a ring. Applications can be developed that require high-speed communication between distributed systems.

Integrated Communications Features

These cards provide remote IPL and high-speed transmission in synchronous, binary synchronous, asynchronous or multi-line operation. The cards plug into I/O slots in the processor or expansion unit.

Programmable Communications Features

These features offer expanded versatility by allowing multiple-line disciplines in a single communications unit. The features can also support a wide variety of mixed terminal types and offer a high degree of adaptability.

4987 Programmable Communications Subsystem

A fully programmable communications multiplexer that allows the use of Series/1 in a wide range of communications applications. The 4987 provides attachment and control facilities for up to 32 lines per unit... and multiple units can be contained in a single Series/1 system.
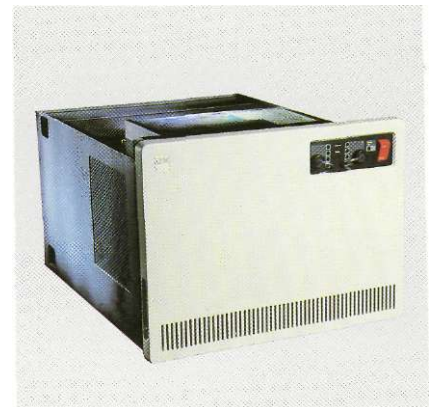
The 4987 helps to make Series/1 a valuable tool for distributing data processing power to remote locations. It provides multiple line disciplines in a single communications unit. Its microprocessor control helps offload the Series/1 processor for communications applications. The 4987 extends the flexibility of Series/1 in providing the ability to attach to non-IBM terminals and CPUs.

Through programming, the 4987 is highly adaptable to growth requirements. Program selectable features give you extensive flexibility to personalize a communications system. They also allow dynamic changes of environment to meet changing application requirements with minimal effect on processing programming.

Over and above the selectable features, the user has programmable storage available in the 4987. A special communications oriented instruction set is provided allowing for the following functions remote to the Series/1 processor:
• Protocol handling
• Control character generation and recognition
• Chaining of I/O operations
•Timer functions
• Autopolling of multipoint lines
• Error retry functions
• Break signal processing
• Upper/lower case character recognition and generation
• Autocalling.

This modular offering consists of: controllers, scanners, subsystem units and device attachment features. Also available is an optional console.

IBM services to assure reliability and availability

Series/1 is backed up with extensive IBM training courses for your operating personnel. Formal classes and self-study programs can help prepare your people to use the system before it is installed. Continuing education can help simplify expansion or change after the system is installed.
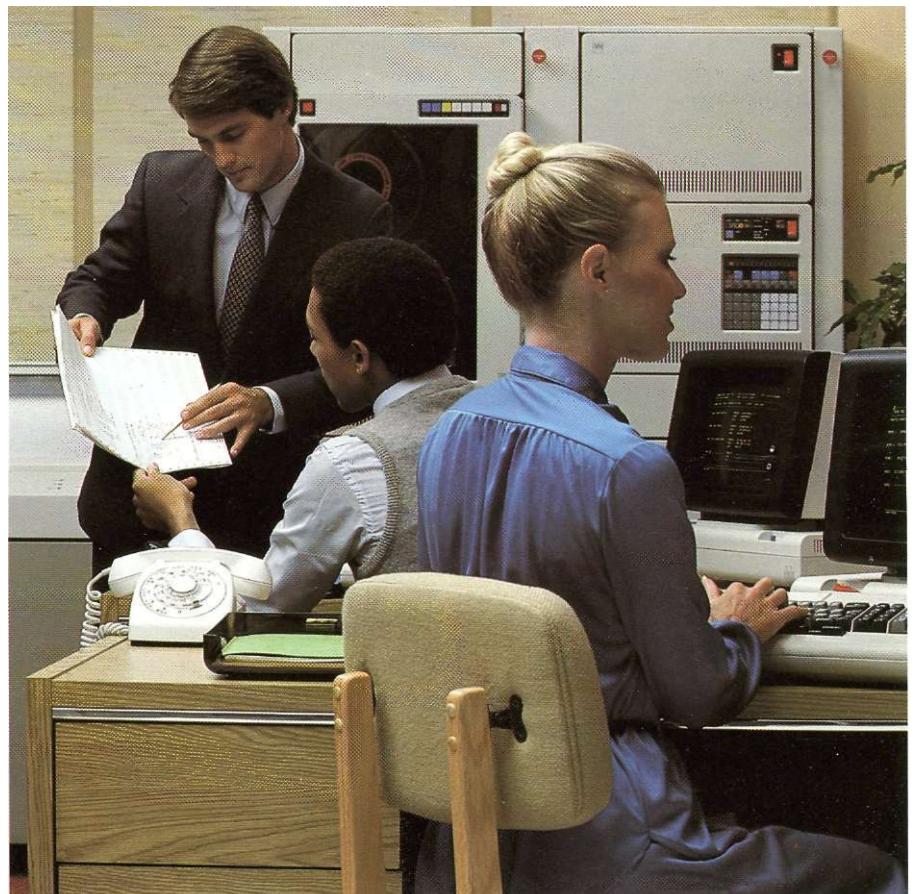
IBM's highly trained Customer Engineers will install your Series/1 and perform extensive tests and diagnostics to give you a thoroughly checked-out system. Ongoing IBM maintenance is available at a monthly charge.

Customer Engineers are supported by a unique IBM computer-based parts inventory system that gets you needed parts as quickly as possible when they are not available locally.
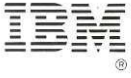
Help in selecting the right system for you

Remember, the IBM Series/1 is a highly versatile general purpose computing system you can tailor to meet your particular requirements.

Let's discuss how we can help you tailor a system to fit your needs from the extensive family of Series/1 offerings. See how Series/1 can provide a modular solution that you can adapt easily when your problems change.

Series/1

IBM
®