

IBM 7531 INDUSTRIAL COMPUTER

IBM Announcement Letter Number 185-053 dated May 21, 1985
IBM US - Last Revised on May 21, 1985

Brief Description of Announcement, Charges, and Availability

The IBM 7531 Industrial Computer is designed for information-handling applications in industrial plant floor environments, where a system more resistant to harsh physical conditions is required. The 7531 is designed for floor-standing operation. It is based on a high-performance Intel 80286 microprocessor, and is equipped with a high-capacity (1.2Mb) diskette drive, 512Kb of standard memory, keyboard, clock/calendar with battery backup, ROM-based BASIC language, and other advanced features.

Customer Letter Section

HIGHLIGHTS

STANDARD FEATURES

- o Advanced high-performance Intel 80286 microprocessor
- o ROM-based automatic power-on self-test of system components
- o ROM-based BASIC language interpreter
- o 8086 compatible real address mode
- o Protected virtual address mode
- o 512Kb of memory
- o 1.2Mb high-capacity diskette drive
- o Combination fixed disk and diskette adapter
- o Fixed disk-in-use indicator light (yellow)
- o System clock/calendar/system configuration storage with battery backup
- o Sound system
- o System reset button
- o Diskette area cover door with security keylock
- o Bidirectional keyboard interface
- o Keyboard
- o Switchable worldwide power supply with cooling fan
- o Cooling fan with removable filter
- o Power-on indicator light (green)
- o Eight input/output (I/O) expansion slots with retainer bar to secure feature cards
- o Socket for Intel 80287 Math Co-processor
- o 24-bit addressing
- o 16-bit data path
- o Seven-channel direct memory access (DMA)
- o 16-level interrupt
- o Three programmable timers

OPTIONAL FEATURES

- o 128Kb Memory Expansion (#0209)
- o 512Kb Memory Expansion (#0203)
- o 20Mb Fixed Disk Drive (#6019) (customer setup)

- o 20Mb Fixed Disk Drive (#6045) (factory installed)
- o Second 1.2Mb High Capacity Diskette Drive (#6038)
- o 360Kb Dual-sided Diskette Drive (#6039)
- o 80287 Math Co-processor (#0211)
- o PC Network Adapter (#0213)
- o PC Network Cabling Components
 - Base Expander (#0230)
 - Distance Kit Short: (#0231), Medium (#0232), Long (#0233)
 - Cabling Segments: 25-foot (#0234), 50-foot (#0235), 100-foot (#0236), 200-foot (#0237)
- o Serial/Parallel Adapter (#0215)
- o Serial Adapter Cable (#0217)
- o Serial Adapter Connector (#0242)
- o Prototype Adapter (#0220)
- o Enhanced Graphics Adapter (#1200)
- o Graphics Memory Expansion Card (#1201)
- o Graphics Memory Module Kit (#1203)
- o Binary Synchronous Communications Adapter (#1204)
- o Synchronous Data Link Control (SDLC) Communications Adapter (#1205)
- o PC Cluster Adapter (#1206)
- o PC Cluster Cable Kit (#1207)
- o Data Acquisition and Control Adapter (#1502)
- o Distribution Panel (#1504)
- o General Purpose Interface Bus Adapter (#1503)
- o Communications Adapter Cable (#2067)
- o Color/Graphics Monitor Adapter (#4910)
- o Combination Adapter Cable (#6001)
- o Combination Adapter II (#6020) *
- o 128Kb Memory Board for the Combination Adapter II (#6040) *

* Available fourth quarter 1985

DESCRIPTION

The IBM 7531 Industrial Computer has been designed to meet industrial environmental conditions. These conditions can be summarized as follows:

- o Extended temperature operation
- o Extended vibration and shock operation
- o Extended voltage transients operation
- o Extended particulates operation.

The 7531 provides plant floor personnel with a system capable of handling computer applications in the plant floor environment.

The 7531 is designed for floor-standing operation. The system unit base is provided with four holes to facilitate optional bolting to the floor or other stable platform. Bolting should be considered only in those situations where placement of the 7531 may affect the stability of the system unit. However, bolting the 7531 is not a requirement for proper operation of the system.

The IBM 7531 Industrial Computer is based on a high-performance 16/24-bit Intel 80286 microprocessor, and is equipped with a high-capacity (1.2Mb) diskette drive, keyboard, ROM-based BASIC language, clock/calendar with battery backup, diskette area cover door with security keylock, and system reset button. Standard memory is 512Kb. The system may be further expanded to 640Kb with the 128Kb memory expansion or 128Kb memory board options or up to 3Mb with the 512Kb memory options.

The system can be further expanded through additional customer

setup options. One or two 20Mb Fixed Disk Drives, a second 1.2Mb High Capacity Diskette Drive, and a Dual-sided (320/360Kb) Diskette Drive are available. A maximum of two diskette drives and one fixed disk drive, or one diskette drive and two fixed disk drives, can be installed in the system unit. These combinations result in direct access storage capacity of up to 41.2Mb.

DOS 3.0 supports the 20Mb Fixed Disk Drive and 1.2Mb High Capacity Diskette Drive in the 7531 system. With DOS 3.0, the 1.2Mb diskette drive will also read single- and dual-sided diskettes formatted at 160/180Kb and 320/360Kb capacity, respectively. The Dual-sided Diskette Drive (320/360Kb) option is available for downward diskette portability with the IBM 5531 Industrial Computer and IBM Personal Computers.

To fully utilize the 1.2Mb High Capacity Diskette Drive, a new diskette medium is required. The medium is available from the IBM Systems Supplies catalog with the following description: IBM 5.25 Diskette 2HC, double-sided, high capacity, 96 tracks per inch, soft sectored, part number 6109660.

To order diskettes, contact IBM Direct, toll-free, via 1 (800) 426-2468.

Eight option (feature) slots support feature cards for devices, features, or memory. Six of the slots support either the advanced 16-bit or the 8-bit option cards. Two support 8-bit option cards only. However, the 7531 uses one 16-bit slot for the standard combination fixed disk and diskette drive adapter. The result is seven available expansion slots. A retainer bar is provided to secure the feature cards.

A cooling fan is included for the worldwide power supply, and a cooling fan with removable filter for the system unit features. The 7531 also includes a diskette area cover door with security keylock, which, when locked by the user, prevents initialization of the system and entry of command/data from the keyboard.

The keyboard offers commonly used data and word processing functions along with separate typewriter and numeric keypads. Key-location enhancements and mode indicators (Cap Lock, Numeric Lock, Scroll Lock) improve keyboard usability. Special symbols may be accessed with a combination of keys. Depending on the application program, from 10 to 40 special function keys may be supported. The keyboard is attached to the 7531 via a 10-foot coiled cable, permitting a variety of workspace configurations.

DESCRIPTION OF FEATURES

512KB MEMORY EXPANSION OPTION (#0203): Adds memory above 1Mb, in 512Kb increments. Up to five options may be plugged into the I/O expansion slots of the system unit to provide a total of three megabytes of primary storage. Performance characteristics are the same as for other 7531 user memory. Note: This option may not be used for address storage from 512Kb to 640Kb. The memory range from 640Kb to 1Mb is reserved for system functions. Each memory increment requires one 16-bit expansion slot.

128KB MEMORY EXPANSION OPTION (#0209): Expands the memory from 512Kb to 640Kb. Performance characteristics are the same as for other 7531 user memory. Only one 128Kb Memory Expansion Option may be installed. It requires a 16-bit expansion slot. Limitation: cannot be installed with the 128Kb Memory Board for the Combination Adapter II (#6040).

20MB FIXED DISK DRIVE (#6019 AND #6045): Two optional fixed disk drives may be installed on the 7531, providing a total of 40Mb of

fixed disk storage capacity. Space and power are provided in the system unit for the drive(s). All fixed disk or diskette drives use the standard combination fixed disk and diskette drive adapter in the system unit. A dedicated landing zone for the read/write heads is available to protect the file and its contents during shipping, movement, or storage. The number of fixed disk drives and diskette drives must not exceed three. No more than two fixed disk drives can be installed in a system unit. #6019 is a customer setup drive.

#6045 is plant installed.

Characteristics:

- o 20Mb of storage
- o 512 bytes per sector
- o 17 sectors per track
- o 75 ms average access time
- o 3600 RPM
- o 5M bit per second transfer rate
- o Dimensions:
 - Height 82.55 mm (3.25 inches)
 - Width 146.05 mm (5.75 inches)
 - Depth 203.20 mm (8.00 inches)
 - Weight 2.3 kg (5.1 lb)

HIGH CAPACITY DISKETTE DRIVE (#6038): This is a half-high, 5-1/4", dual-sided drive with a 1.2Mb storage capacity. Space and power have been provided in the system unit for up to two drives. The drive is fully self-contained and consists of a spindle drive system, a read positioning system, and a read/write/erase system.

One of these drives is standard in the 7531. An optional second drive may be installed in the system unit adjacent to the first if the space is not occupied by another diskette drive. Both drives use the standard combination fixed disk and diskette drive adapter in the system unit. The number of fixed disk drives and diskette drives must not exceed three.

The drive uses the new 96-TPI, high-density medium. In addition, it will read or write 48-TPI, single- or dual-sided media written for the IBM 5531 Industrial Computer and IBM Personal Computers, providing a high level of compatibility with existing applications. However, once a 48-TPI medium has been written in this drive, it may only be read by a high-capacity diskette drive.

Characteristics:

- o 1.2Mb storage
- o 512 bytes per sector
- o 15 sectors per track
- o 96 tracks per inch
- o Two sides
- o 80 tracks per side
- o 360 RPM
- o Supports 300K and 500K bits/second data transfer rate
- o 94 ms average access time in 96-TPI mode
- o Dimensions:
 - Height 42.9 mm (1.7 inches)
 - Width 149.0 mm (5.9 inches)
 - Depth 202.1 mm (8.0 inches)
 - Weight 1.6 kg (3.5 lb)

DUAL-SIDED DISKETTE DRIVE (#6039): This diskette drive permits the exchange of 320/360Kb diskette media between the 7531, the IBM 5531

Industrial Computer, and IBM Personal Computers. It is a half-high, 5-1/4", dual-sided drive with a 320/360Kb storage capacity. Space and power for one drive have been provided in the system unit. The drive is fully self-contained and consists of a spindle drive system, a read positioning system, and a read/write/erase system.

This drive is installed in the system unit adjacent to the standard high-capacity diskette drive if the space is not occupied by another diskette drive. This drive uses the standard combination fixed disk and diskette drive adapter in the system unit. The number of fixed disk drives and diskette drives must not exceed three.

Characteristics:

- o 320/360Kb of storage
- o 512 bytes per sector
- o 8/9 sectors per track
- o Two sides
- o 91 ms average access time
- o 40 tracks per surface
- o 48 tracks per inch
- o 300 RPM
- o Transfer rate of 250K bits/second
- o Dimensions:
 - Height 42.9 mm (1.7 inches)
 - Width 149.0 mm (5.9 inches)
 - Depth 202.1 mm (8.0 inches)
 - Weight 1.6 kg (3.5 lb)

MATH CO-PROCESSOR (#0211): A high-performance numeric 80287 processor extension with floating point, extended integer, and BCD data types, compatible with the Intel 8087 Math Co-processor. When installed, the system fully conforms to the proposed IEEE Floating Point Standard and is an excellent facility for high-performance numeric processing. Only one Math Co-processor can be installed in a system unit.

PC NETWORK ADAPTER (#0213): The IBM PC Network is a low-cost, broadband, local area network. It provides a reliable, low-maintenance network using standard 75-ohm coaxial cable (CATV compatible) and standard broadband components. The network uses carrier sense multiple access/collision detect (CSMA/CD) protocol to transmit data at 2 million bits per second. The network consists of the IBM 5178 PC Network Translator Unit, which provides single channel frequency translation for the network, the IBM PC Network Adapter (#0213), which attaches IBM Industrial and Personal Computers to the network, and eight IBM PC Network Cabling Components, which may be used to attach up to 72 IBM Industrial and Personal Computers within a 1,000-foot radius of the translator unit.

The IBM 5178 PC Network Translator Unit provides fixed frequency translation for the IBM PC Network. One translator unit is required for each network. The translator unit is supplied with a separately packaged 120-volt transformer, which plugs into a standard grounded electrical outlet.

The translator unit has a connector assembly for attaching up to eight IBM Industrial or Personal Computers within a radius of 200 feet (cable segments may be purchased separately). The translator also has an expansion port for attaching the IBM PC Network Base Expander (#0230), which permits attachment of up to 64 additional Industrial or Personal Computers to the network, for a total of 72.

The 5178 environmental specifications are lower than those of the 7531. Consequently, the 5178 must be installed in a location

where the environmental conditions are similar to those of an office environment.

The IBM PC Network Adapter is a feature card that plugs into each IBM Industrial or Personal Computer in the network. It is supplied with a three-meter (nine-foot) attachment cable that can be connected directly to, or within 200 feet of, the IBM PC Network Translator Unit. The IBM PC Network Cabling Segments are used to extend the distance up to 200 feet.

The optional IBM PC Network Cabling Components contain a variety of preassembled wires and connectors that permit installation of a variety of network topologies. They are designed to extend the functional capabilities of the network. These cabling components can be used to increase the maximum number of attached stations from 8 to 72, and to increase the maximum distance of coverage from a radius of 200 feet to a radius of 1,000 feet. The cable component options that provide for end-to-end connection include a Base Expander, three Expansion Kits, and four Cable Segments preassembled from standard CATV components. Standard F connectors are used to connect cable components.

The IBM PC Network Base Expander (#0230) is required to expand the network to include more than eight IBM Industrial or Personal Computers or more than a 200-foot radius from the translator unit. The Base Expander is a prerequisite for the attachment of up to eight Short, Medium, or Long Distance Kits in any combination. Each Distance Kit can attach up to eight IBM Industrial or Personal Computers. In addition, the Medium and Long Distance Kits extend the network by 400 feet and 800 feet, respectively. In combination with cabling segments, the Short, Medium, and Long Distance Kits can extend the network up to a 1,000-foot radius from the translator unit.

SERIAL/PARALLEL ADAPTER (#0215): Provides a serial port and a parallel port. The serial portion is fully programmable and supports asynchronous communications from 50 to 9,600 baud. The back of the adapter has a nine-pin D-shell connector that is classified as an RS232-C port. When the optional 10-foot Serial Adapter Cable (#0217) or 10-inch Serial Adapter Connector (#0242) is connected to the adapter, the 25-pin end of the cable or connector has all the signals of a standard EIA RS232-C interface. The parallel portion of the adapter provides the ability to attach various devices that accept eight bits of parallel data. The parallel port is provided by a 25-pin, D-shell connector. One or two Serial/Parallel Adapters may be installed. Each requires one expansion slot of either type. Note: This adapter does not support current loop operation.

PROTOTYPE ADAPTER (#0220): This adapter is 4.8 inches high by 13.12 inches long. Two card edge tabs, one 2 by 31 positions and one 2 by 18 positions, provide all system control signals and voltages. No components are shipped with this card.

The adapter contains a voltage bus (+5 Vdc) and a ground bus (0 Vdc). Each bus borders the adapter with the ground bus on the component side and the voltage bus on the pin side. A system interface (wiring only) is also provided with a space for a jumper to specify whether the device has an 8- or a 16-bit data bus. This adapter also accommodates a D-shell connector from 9 to 37 positions. A recommended system interface logic diagram is available, along with a list of recommended components to be used to interface custom logic to the 7531. Up to five Prototype Adapters can be installed in a

system unit. Each requires a 16-bit expansion slot.

ENHANCED GRAPHICS ADAPTER (#1200): Provides support for the new IBM 7534 Industrial Graphics Display and enhanced support for the IBM 5532 Industrial Color Display. It requires one expansion slot of either type. The IBM Graphics Memory Expansion Card (#1201) expands the IBM Enhanced Graphics Adapter's 64Kb memory to 128Kb and increases the color range for 640 x 350 graphics from four colors to 16 colors. The IBM Graphics Memory Module Kit (#1203) expands the expansion's card memory to 256Kb, providing additional graphics function.

The Enhanced Graphics Adapter:

- o Supports the IBM 5532 Industrial Color Display or the new IBM 7534 Industrial Graphics Display.
- o Allows full 16-color graphics with the IBM 5532 Industrial Color Display in either 320 x 200 medium definition graphics or 640 x 200 high definition graphics modes.
- o Provides 640 x 350 support in up to 16 colors for graphics on the new IBM 7534 Industrial Graphics Display.
- o Provides high-quality (8 x 14 character box) text in color on the new IBM 7534 Industrial Graphics Display.
- o Allows users to select under program control from a palette of 64 colors when connected to the new IBM 7534 Industrial Graphics Display.
- o Provides 64Kb graphics memory on the IBM Enhanced Graphics Adapter, expandable to 128Kb with the Graphics Memory Expansion Card.
- o Expands graphics memory to 256Kb with the Graphics Memory Module Kit. This added memory may be used to support smooth scrolling, panning (scanning sequentially through graphics memory), and additional pages of graphics data.
- o Allows compatibility modes to execute programs written for the IBM Color/Graphics Monitor Adapter with the IBM 5532 Industrial Color Display. Composite video support for attaching analog monitors or TV sets is not provided.
- o Allows RAM-resident character generator to be loaded from user programs allowing any set of 256 characters to be incorporated into applications.
- o Allows character space expansion to 512 with the IBM Graphics Memory Expansion Card and to 1,024 with the IBM Graphics Memory Module Kit.

BINARY SYNCHRONOUS COMMUNICATIONS ADAPTER (#1204): Provides an EIA RS232-C interface. It is compatible with the IBM 7532 Industrial Computer, the IBM 5531 Industrial Computer, the IBM Personal Computer, the IBM Personal Computer XT, the IBM Portable Personal Computer, and the IBM Personal Computer AT. A maximum of two Binary Synchronous Communication (BSC) Adapters may be installed. Only one BSC Adapter may be installed if an SDLC Adapter (#1205) is installed. Each adapter requires one expansion slot of either type.

SDLC COMMUNICATIONS ADAPTER (#1205): Provides an EIA RS232-C interface. It is compatible with the IBM 7532 Industrial Computer, the IBM 5531 Industrial Computer, the IBM Personal Computer, the IBM Personal Computer XT, the IBM Portable Personal Computer, and the IBM Personal Computer AT. Only one SDLC Adapter may be installed. It requires one expansion slot of either type.

COMMUNICATIONS ADAPTER CABLE (#2067): Allows the user to connect the

Binary Synchronous Communications Adapter (#1204) or the SDLC Communications Adapter (#1205) to a modem via a plug at the rear of the 7531. The cable is double shielded and approximately three meters (10 feet) long. A wrap connector is provided to test the cable.

PC CLUSTER ADAPTER (#1206): Used to connect the 7531 in a clustered multi-user configuration consisting of other 7531s, IBM 7532 Industrial Computers, IBM 5531 Industrial Computers, and IBM Personal Computers. This option supports up to 64 computers in a cluster (actual number is dependent on performance characteristics). Each computer in the cluster beyond the first two requires an additional PC Cluster Cable Kit (#1207). The adapter requires one expansion slot of either type.

DATA ACQUISITION AND CONTROL ADAPTER (#1502): An analog and digital I/O card that can be plugged directly into the system unit. This option can be used in a scientific/industrial laboratory setting to control processes, monitor transducers (flow, pressure, temperature, and so on), and automate electronic testing. It requires one expansion slot of either type.

The IBM Data Acquisition and Control Adapter Distribution Panel (#1504) is an optional feature that provides easy access to the I/O signals, voltages, and grounds of the IBM Data Acquisition and Control Adapter. The distribution panel is connected to the adapter by a shielded cable. The distribution panel is a printed circuit board with four barrier-type screw terminal strips for a total of 88 terminations. A shielded flat cable with a 60-pin connector is permanently attached to the board. The cable and terminal board assembly is housed in a metal enclosure that is slotted to allow user cabling to enter or exit. The cable is approximately 34 inches long.

Up to four IBM Data Acquisition and Control Adapters can be attached to the 7531.

The Adapter has:

- o Four analog input channels (12-bit resolution)
- o Two analog output channels (12-bit resolution)
- o 16-channel digital input port
- o 16-channel digital output port
- o Programmable sampling rates provided by a 32-bit timer
- o Event counter, programmable rate generator, or programmable time delay provided by a 16-bit user timer/counter.

The Distribution Panel has:

- o Screw terminals to attach devices to the distribution panel
- o Multiple grounds for twisted pair terminations
- o Shielded construction to minimize noise interference.

Application areas that may be addressed with the IBM Data Acquisition and Control Adapter include:

- o Chromatography
- o Electrochemistry
- o Energy management
- o Electronic testing
- o Process control
- o Data logging
- o Robotics.

Some parameters commonly monitored or controlled include:

- o Pressure
- o Flow
- o Temperature
- o Displacement

- o Voltage
- o Light intensity
- o Rotational speed.

Some examples of instruments or devices that may utilize the adapter are:

- o Chromatographs
- o Spectrophotometers
- o Pressure gauges
- o Relay controls
- o Thermocouples
- o Gas analyzers
- o Humidity sensors
- o Valve actuators
- o Level gauges
- o Load cells
- o Conductivity cells
- o pH meters.

GENERAL PURPOSE INTERFACE BUS ADAPTER (#1503): Provides an interface between the 7531 and the IEEE-488 General Purpose Interface Bus (GPIB), allowing control of multiple devices or instruments (such as plotters, multimeters, and disk drives). Up to four GPIB Adapters can be installed in a system unit. Each adapter requires one expansion slot of either type. The IBM GPIB Adapter can perform as a controller, a talker, or a listener with compatible devices. The IBM GPIB Adapter also provides capabilities for data transfer between workstations, and the connection of several computers for sharing of instruments or peripheral I/O devices.

The IBM GPIB Adapter is designed to the ANSI/IEEE-488

standard, including the 488A-1980 supplement, and:

- o Supports up to 14 devices or instruments
- o Provides a direct memory access data rate of up to 300Kb/second
- o Provides a programmed I/O data rate of up to 20Kb/second
- o Allows user selection of direct memory access channels
- o Allows the user to select the interrupt level.

COLOR/GRAPHICS MONITOR ADAPTER (#4910): To attach a color display to the 7531. Either a "direct-drive RGB" signal or a "composite" video signal can be selected. The display can be a direct-drive IBM 5532 Industrial Color Display, an IBM 7534 Industrial Graphics Display, a video monitor, or, through a customer-supplied RF modulator, a standard TV set. Either a color or black-and-white monitor or TV can be attached. Sixteen foreground and 8 background colors are supported in text (character) mode. This attachment also provides support for four-color medium definition graphics (320 dots horizontal, 200 dots vertical) and black-and-white high definition graphics (640 dots horizontal, 200 dots vertical). In text mode, 256 characters are available; 128 are available in medium or high definition graphics. The adapter provides 16Kb of built-in memory to store multiple display screen contents and supports a customer-supplied light-pen. It requires one expansion slot of either type.

COMBINATION ADAPTER II (#6020) (available fourth quarter 1985): Provides the 7531 with four main functions: an asynchronous communications interface, a parallel printer interface, a programmable timer, and a thermal sensor interface. The adapter requires one 16-bit expansion slot.

The asynchronous communications interface is fully programmable and supports asynchronous communications only. All of the specifications of this interface match those of the Serial/Parallel Adapter (#0215). In addition, the serial interface can be configured to support an RS422 interface. The cable interface to the asynchronous communications port is via a 9-pin connector at the rear of the system unit. The Combination Adapter Cable (#6001) is required to convert the 9-pin Asynchronous Communications port of the Combination Adapter II to a 25-pin "D" shell, male type connector for attachment to an external modem or other asynchronous devices. The cable is double shielded and approximately three meters (10 feet) long. A wrap connector is provided to test the cable.

The parallel printer interface is specifically designed to attach printers with a parallel interface. All of the specifications of this interface match those of the Serial/Parallel Adapter (#0215).

The programmable timer has a counter resolution of 4/1,000 of a second.

The thermal sensor interface connects to a thermal sensor inside the system unit and allows the system processor to sense when the system unit is over its specified temperature range. A bit in the sensor port is set by the thermal sensor to indicate to the system software (DOS) that the system unit is over its specified temperature range.

128KB MEMORY BOARD FOR THE COMBINATION ADAPTER II (#6040) (available fourth quarter 1985): Plugs into the Combination Adapter II (#6020) and expands the memory from 512Kb to 640Kb without requiring an expansion slot. Performance characteristics are the same as for other 7531 user memory. Only one 128Kb Memory Board may be installed on a Combination Adapter II. Limitation: cannot be installed with 128Kb Memory Expansion (#0209).

PUBLICATIONS

The system will be shipped with two manuals:

- o IBM 7531 Industrial Computer Operator's Guide
- o IBM 7531 Industrial Computer Installation and Setup Manual.

The following manuals are available for purchase:

- o IBM 7531/7532 Industrial Computer Technical Reference Manual System Unit (#6032)
- o IBM 7531/7532 Industrial Computer Maintenance Information Manual (#6033)
- o IBM Industrial Computer Technical Reference Options and Adapters (#6035)
- o IBM Personal Computer BASIC Reference Manual Version 3.0 (#1132).

SCHEDULE

First customer shipment is planned for third quarter 1985. Orders for the 7531 will be accepted immediately. Multiple quantity orders are subject to an extension of schedules.

TECHNICAL INFORMATION

SYSTEM UNIT

- o INTEL 80286 microprocessor
- o 6.0 MHz clock speed
- o 24-bit addressing
- o 16-bit data path
- o 64Kb ROM:
 - Access time - 150 ns
 - Cycle time - 355 ns
- o Dimensions:

- Depth 600.0 mm (23.6 inches)
 - Width 266.0 mm (10.5 inches)
 - Height 650.0 mm (25.6 inches)
 - o Weight:
 - 36.3 kg (80 lb)
- SPECIFIED OPERATING ENVIRONMENT
- o Electrical:
 - 192-watt power supply
 - AC operating voltages:
 - . 90-137 v, 50-60 Hz
 - . 180-259 v, 50-60 Hz
 - Power line lightning surges of +/- 2,500 volts, as outlined in FCC Docket 19528 - Part 68
 - o Air temperature:
 - System on: 0 degrees to 50 degrees C (32 degrees to 120 degrees F)
 - System off: 0 degrees to 55 degrees C (32 degrees to 131 degrees F)
 - o Relative humidity:
 - 8% to 80% noncondensing
 - o FCC Class A
 - o Particulates contaminants filtering:
 - Suspended particulates: 500 micrograms per cubic meter
 - Benzene soluble organics: 30 micrograms per cubic meter
 - Settleable particulates: 1,500 micrograms per square centimeter for 30 days
 - o Shock:
 - 0.5 G at 10 millisecond duration
 - o Vibration:
 - 5 to 17 Hz at 0.005 inches double amplitude displacement
 - 17 to 200 Hz at 0.07 G peak
 - 200 to 500 Hz at 0.036 G peak
 - o BTU output: 1,229 BTU/hr

COMPATIBILITY

The following hardware products are supported on the 7531:

- o IBM 5532 Industrial Color Display
- o IBM 7534 Industrial Graphics Display
- o IBM 5178 PC Network Translator Unit*.

* See #0213 under "Description of Features" above for 5178 environmental considerations.

SECURITY, AUDITABILITY, AND CONTROL

The 7531 can be used and managed so as to limit the risk of unintended modification, destruction, or disclosure of sensitive data.

User management is responsible for evaluation, selection, and implementation of security features, for administrative procedures, and for appropriate controls in application systems.

If sensitive data is sent over external communication facilities, user management may wish to pursue the application of cryptography.

PLANNING INFORMATION

CUSTOMER RESPONSIBILITY: The customer is responsible for unpacking and installing system components and options in accordance with the installation instructions provided.

INSTALLABILITY: The keyboard is plugged directly into the system unit. The display and printer are connected via option adapters

installed in the system expansion slots. Once turned on, the system unit automatically runs a power-on self test to verify system readiness. The system unit keylock must be unlocked to complete this self test. If a failure is found, an instruction will appear on the screen.

If the test is successfully completed, the system attempts to load an operating system (such as DOS) from the first diskette drive. If that drive does not supply the program, the system tries the first fixed disk. If this operation is not completed, the BASIC Interpreter is made ready, identified on the screen, and the system is available for use.

LIMITATIONS: Other IBM 5531 Industrial Computer options, adapters, or devices not specifically listed as supported by the 7531 are not supported. Some of these nonsupported items include:

- o 64Kb Memory Module Kit (#1003)
- o 64/256Kb Memory Expansion Option (#1013)
- o 5531 Keyboard
- o Asynchronous Communications Adapter (#2074)
- o Binary Synchronous Communications Adapter (#2075)

- o SDLC Communications Adapter (#2090)
- o 10Mb Fixed Disk Drive (#2500)
- o Fixed Disk Adapter (#2501)
- o 5-1/4" Diskette Drive Adapter (#3780)
- o 5-1/4" Dual-sided Diskette Drive (#3810)
- o XT/370 Option Kit (#1509)
- o Combination Adapter (#6000)
- o Keylock Option Kit (#6002).

PREREQUISITES: The 7531 requires a video display adapter and device for display output. It is powered by a standard 115/230 v, 50 Hz or 60 Hz power source (voltage can be switched by user). IBM Personal Computer DOS 3.0 or later is required. (DOS 3.1 is required for the IBM PC Network.)

PACKAGING: The system unit, keyboard, and options are packed in separate cartons. An additional carton contains the power cord, the IBM 7531 Industrial Computer Installation and Setup Manual, and the IBM 7531 Industrial Computer Operator's Guide.

TECHNICAL ASSISTANCE

Customers who have signed an IBM Industrial Computer Volume Procurement Amendment (VPA) and have ordered twenty or more IBM 7531 Industrial Computers may designate from one to three technical coordinators who may contact the Personal Computing Assistance Center (PCAC) for usage assistance. The usage assistance is available for the contract period.

Customer technical coordinators may participate in an education program administered by the PCAC. The education may be self-study or conducted in a classroom at a PCAC-selected location.

CHARGES, TERMS, AND CONDITIONS

TERMS AND CONDITIONS

CUSTOMER SETUP: The 7531 and its options are designated as customer setup (CSU). The CSU allowance is one day. Detailed setup instructions are included with each machine and option. Setup service is available from the IBM National Service Division at IBM hourly rates and minimums, or by a Contract Support Service (CSS) Agreement.

MACHINE GROUP: A

IBM HOURLY SERVICE RATE CLASSIFICATION: 2

WARRANTY PERIOD: One year for the 7531 and all optional features except the Prototype Adapter (#0220), which is one year, unless this feature is modified, at which time warranty provisions are terminated.

During the 7531 warranty period, warranty periods for optional features that are less than one year will be extended to coincide with the expiration of the 7531 warranty. Optional features that are installed subsequent to the 7531 installation, such that their warranty period extends beyond that of the 7531, will assume their normal warranty.

WARRANTY SERVICE: IBM On-Site Repair (IOR)

MAINTENANCE SERVICE: In the industrial environment, IBM will provide on-site warranty and maintenance service for the failing machine at the customer's central facility under the terms and conditions of the Agreement for Purchase of IBM Machines or IBM Maintenance Agreement as amended by a revised Amendment for Central Facility Maintenance Service (Z125-3333-01). The revised Amendment for Central Facility Maintenance Service, included in this announcement, will be available in Mechanicsburg by June 17, 1985. Its supplement (Z125-3334-00) is not revised and is available in Mechanicsburg.

Note: Customers should be aware of their specific responsibilities as they relate to central facility service.

In the office environment, IBM will provide on-site warranty and maintenance service for the failing machine at the machine's operational location under the terms and conditions of the Agreement for Purchase of IBM Machines or IBM Maintenance Agreement.

The 7531 maintenance charges do not include the 20Mb Fixed Disk Drives (#6019 and #6045). All other announced features are included in the system unit maintenance charge.

The customer must ensure that the system unit is unlocked when presented for service.

HOURLY SERVICE: Hourly service may be obtained by calling the IBM Service/Exchange Communication Center's toll-free number: (800) 428-2569. The S/ECC will give the customer instructions on how to obtain hourly service.

SELF SERVICE: In addition to the IBM service offerings, the customer may purchase the Maintenance Information Manual, which will enable the customer to isolate a problem to an under-the-cover field replaceable unit (FRU).

VOLUME PROCUREMENT: The 7531 is included in the IBM Industrial Computer Volume Procurement Amendment (VPA) Exhibit. The 7531 may be substituted for other Category A machines. For details, contact your IBM marketing representative.

SPECIAL BID PROVISIONS: Special bid provisions apply. The 7531 is available under Category A of all Industrial Computer special bid contracts with discounts, terms, and conditions consistent with the Industrial Computer Volume Procurement Amendment (VPA) Exhibit.

EDUCATIONAL ALLOWANCE: An educational allowance of 20% is available to qualifying institutions. Qualifying customers may choose volume procurement discounts or the educational allowance, but not both.

TESTING ALLOWANCE: None

FINANCING: IBM Credit Corporation Term Leases and Installment Payment plans are available.

CHARGES

Model/	Single Unit
--------	----------------

	Feature Number	Purchase Price
7531 System Unit/ Keyboard	041	\$6,145
Memory Expansion		
512Kb Option	0203	1,125
128Kb Option	0209	350
20Mb Fixed Disk Drive (customer setup)	6019	1,695
20Mb Fixed Disk Drive (plant installed)	6045	1,475
Diskette Drive		
High Capacity	6038	650
Dual-sided	6039	425
Math Co-processor	0211	375
PC Network, Adapter	0213	695
Base Expander	0230	59
Distance Kit		
Short	0231	39
Medium	0232	79
Long	0233	89
Cabling Segments		
25-foot	0234	29
50-foot	0235	39
100-foot	0236	59
200-foot	0237	99
Serial/Parallel Adapter	0215	150
Serial Adapter Cable	0217	65
Prototype Adapter	0220	35
Serial Adapter Connector	0242	35
Enhanced Graphics Adapter	1200	524
Graphics Memory Expansion Card	1201	199
Graphics Memory Module	1203	259
BSC Adapter	1204	240
SDLC Adapter	1205	240
PC Cluster Adapter	1206	340
PC Cluster Cable Kit	1207	110
DAC Adapter	1502	1,275
Distribution Panel	1504	245
GPIB Adapter	1503	395
Communications Adapter Cable	2067	65
Color/Graphics Monitor Adapter	4910	244
Combination Adapter Cable	6001	75

Combination		
Adapter II	6020	450
128Kb Memory		
Board	6040	415
Annual Minimum Maintenance Charges		
	Model/	
	Feature	IOR
Machine	Number	(#9798)
7531	041	\$420
	6019	138
	6045	138

Note: For CFM service, the minimum number of machines for each service request is one. The Additional Maintenance Charge Factor is one half hour.

Publication Prices

	Feature	Single
	Number	Copy
		Price
Technical Reference		
System Unit	6032	\$ 65
Maintenance		
Information Manual	6033	295
Technical Reference		
Options and		
Adapters	6035	295
Operator's Guide	6046	50
Installation and		
Setup	6047	30
BASIC Version 3.0		
Reference Manual	1132	40

Please contact your IBM marketing representative if you require additional information.

Notice to IBM Customers

May 21, 1985

REVISED EXHIBIT - IBM INDUSTRIAL COMPUTER VOLUME PROCUREMENT AMENDMENT

IBM has announced two new members of the IBM Industrial Computer Family. The Exhibit to the IBM Industrial Computer Volume Procurement Amendment has been changed to add these new machines in the category noted below:

- o IBM 7531 Industrial Computer (Category A)
- o IBM 7532 Industrial Computer (Category A).

Customers with VPAs in effect may substitute and aggregate machines by category in order to maximize the discounts that apply. A copy of the revised Exhibit is attached to this Notice and is effective for all purchases on or after May 21, 1985. (SEE HARD COPY FOR EXHIBIT.)

Please contact your IBM marketing representative if you require additional information.

NOTICE TO IBM CUSTOMERS

REVISED EXHIBIT - ALTERNATIVE CERTIFICATION FOR IBM MACHINES

IBM has announced a revised Exhibit to the Alternative Certification for IBM Machines. Under this revised Exhibit, the IBM 5531, 5532, 7531, 7532, and 7534 are added to the list of machines that are not Eligible Machines under the Alternative Certification

for IBM Machines. A copy of the revised Exhibit is attached to this Notice and is effective for all purchases on or after May 21, 1985. (SEE HARD COPY FOR EXHIBIT.)

Please contact your IBM marketing representative if you require additional information.