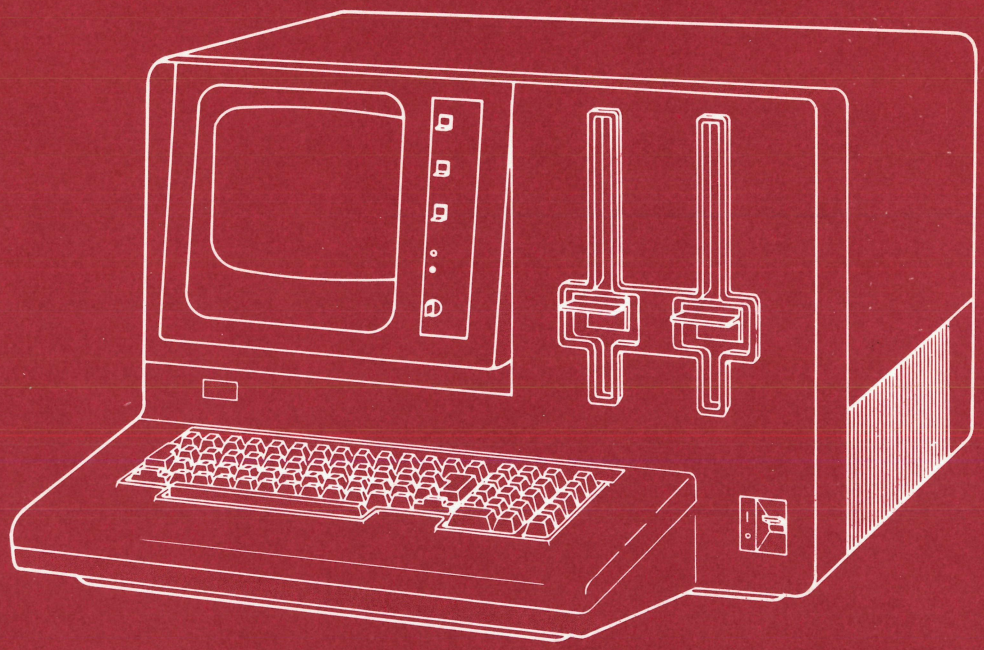
IBM

IBM 5120 Computing System General Information and Site Preparation Manual

5120



GA34-0130-1

5120 Computing System
General Information and Site Preparation Manual

IBM 5120 Computing System General Information and Site Preparation Manual

Second Edition (March 1980)

This is a major revision of and obsoletes GA34-0130-0.

Use this publication only for the purpose stated in the Preface.

Changes are periodically made to the information herein; any such changes will be reported in subsequent revisions or Technical Newsletters.

It is possible that this material may contain reference to, or information about, IBM products (machines and programs), programming, or services which are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Publications are not stocked at the address given below. Requests for copies of IBM publications should be made to your IBM representative or the IBM branch office serving your locality.

This publication could contain technical inaccuracies or typographical errors. A form for readers' comments is provided at the back of this publication. If the form has been removed, address your comments to IBM Corporation, Systems Publications, Department 27T, P.O. Box 1328, Boca Raton, Florida 33432. IBM may use and distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

Preface

Purpose of this manual

The primary purpose of this manual is to provide the information required to prepare a site for the setup of the IBM 5120 Computing System. It also includes a summarized description of the system which can be used by executives and supervisory personnel to see how this system can be used to meet their information processing requirements.

Written for readers who have no, or very little, direct experience using a computer, this manual includes:

- An overview of the physical characteristics and the operating characteristics of the system
- A summary of options and services related to the system
- Site preparation information for the system
- Technical specifications for the system and its options

At the back of this manual is a glossary that defines some of the data processing terms introduced in this manual.

Related publications

The publications that make up the 5120 computing system library are described in Appendix B of this manual. You will receive the various publications you will need based upon your system, language, and optional features.

Preface

Contents

Contents

Chapter 1. An overview of the IBM 5120 Computing System

Introduction

The IBM 5120 Computing System is a general purpose system that brings the capabilities of a large-scale computing system into virtually every small business. This system is well suited to applications such as:

- General ledger
- Accounts payable
- Payroll
- Accounts receivable
- Financial planning
- Inventory control
- Order writing/billing
- Sales analysis
- Cost estimating
- Job cost analysis
- Word processing

The 5120 computing system performs data processing tasks with the efficiency and reliability typical of larger computing systems. It is however, especially appropriate for small businesses because of:

- **Physical compactness and ease of setup.** The central unit for the system is in the IBM 5110 Model 3 Computer, a desk-top unit. The system is designed for customer setup. You will be able to connect the machines and check them out when they arrive. The system can be setup in virtually any office environment.
- **Ease of operation.** An employee with little or no computer experience can learn how to operate this system effectively.

Introduction (continued)

- **Application programs.** Where applicable, the IBM-supplied application programs can eliminate the need for you to write your own programs. These programs are made available by IBM to meet certain data processing requirements existing within a specific business or industry. Your IBM marketing representative can tell you what application programs are available.

- **Two programming languages: BASIC and APL.** BASIC (Beginners All Purpose Symbolic Instruction Code) combines general business and mathematical problem-solving capabilities. APL (A Programming Language) is a mathematical language. It is particularly well-suited for scientific, engineering, and research applications. Each language is easy to learn and has inherent capabilities that apply directly to the needs of business people who require fast and accurate data processing.

- **System options.** You can choose from several options to meet your particular needs. A description of the major features and options available for the 5120 computing system is provided in Chapter 2 of this manual:

To make this manual most useful:

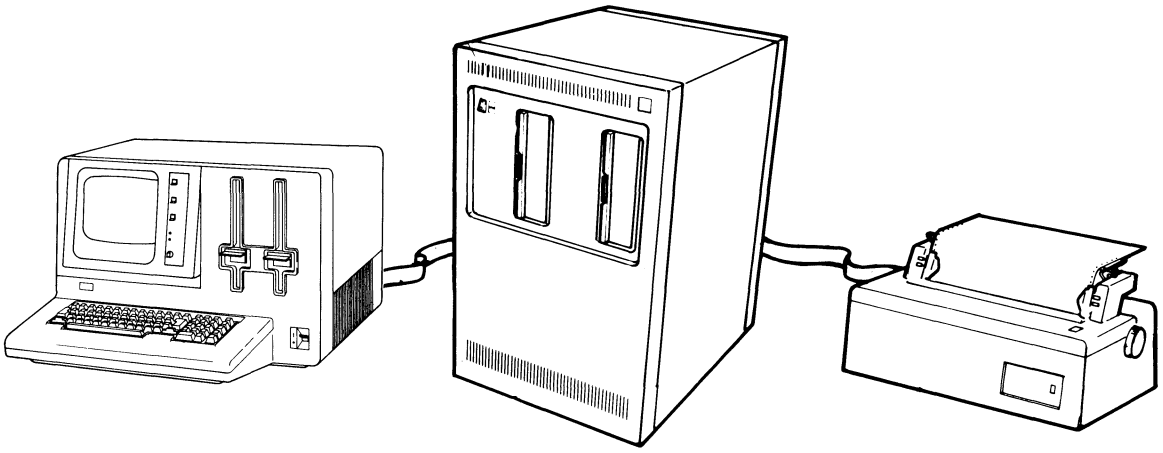
- If your interest is getting the site ready for delivery of the system, you may go directly to Chapter 3, "Site preparation information."

- Appendix A contains technical information which your building technician or your contractor may need. If you have technical experience, you may find it valuable.

Physical characteristics

The 5120 computing system can include:

- The IBM 5110 Model 3 Computer
- The IBM 5114 Diskette Unit
- The IBM 5103 Printer



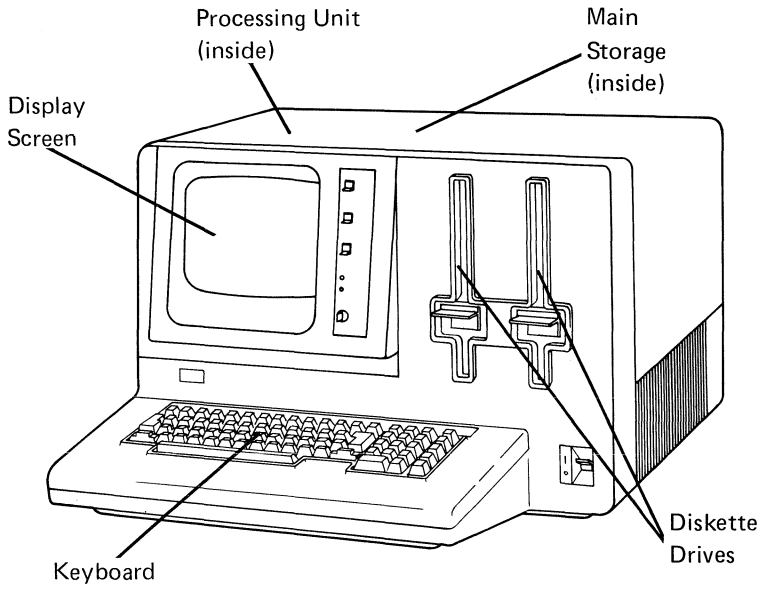
5110 Model 3 Computer | 5114 Diskette Unit | 5103 Printer

It is possible to have a complete system with only one or two units. For example, a 5110 Model 3 computer is a productive system. Another configuration is a 5110 Model 3 computer with a 5103 printer. You can tailor your system to your own data processing needs. As your requirements grow, you can add units and features to your system. See your IBM marketing representative for details concerning your exact system requirements.

The 5110 Model 3 computer

The 5110 Model 3 Computer is compact and highly functional. It consists of the following parts:

- *A processing unit.* The processing unit is the arithmetic/logic unit and the control center for the system.
- *A keyboard.* The keyboard is similiar to a standard typewriter keyboard. In addition, a 10-key numeric key pad is provided to aid in entering numbers. You use the keyboard to enter information (commonly referred to as data) and instructions into the system.
- *A display screen.* The display screen looks like a TV screen measuring 9 inches diagonally. It can show you over 1.000 characters of data.



- *Two diskette drives.* The system stores data and programs on magnetic diskettes. In this way, the system provides a way to recall and reuse information without the need for rekeying. The removable diskettes can have a storage capacity of up to 1.2 million bytes (one byte can hold one character of information). The 5110 Model 3 has two diskette drives, so it can have up to 2.4 million bytes of information operating under control of the computer at one time (online). Because the diskettes are removable, the total amount of data you can store is unlimited.

- *Main storage*. Main storage holds the programming instructions and data to be processed. The 5110 Model 3 comes with at least 16,000 bytes of main storage. Additional main storage can be ordered to increase the system's capacity to as much as 64,000 bytes.

- *A choice of BASIC and/or APL programming languages*. You can order the 5110 Model 3 with either BASIC, APL, or both languages. If your system has both languages, you use only one language at a time, but you can conveniently switch from one programming language to the other. These programming languages are discussed later in this chapter.

- *Composite video adapter*. The composite video adapter allows you to attach up to six black-and-white TV monitors to the 5110 Model 3. Thus, the information that is on the computer's display screen can be viewed in remote locations.

- *Audible alarm*. You can use the audible alarm to indicate an error, request operator action (such as changing printer forms or changing diskettes), alert the operator that a job is complete, or for other purposes.

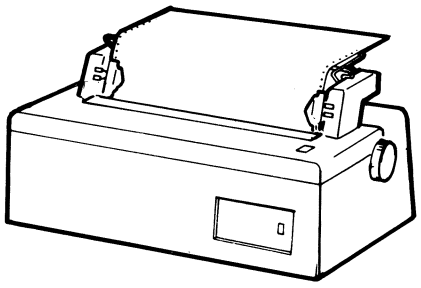
Physical characteristics (continued)

The 5103 printer

The 5103 printer is a compact, table-top printer that produces reports and documents as you need them.

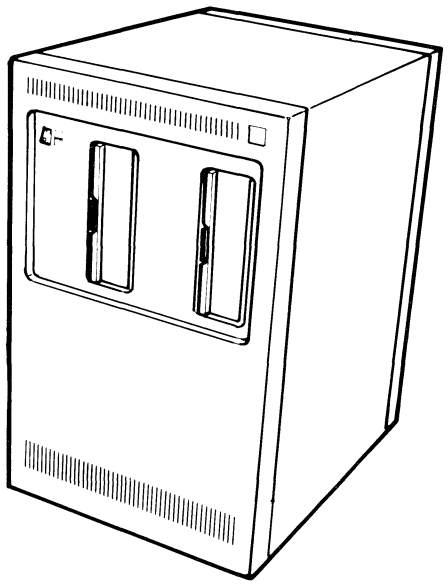
The 5103 printer is available in two models. Model 11 has a speed of 80 characters per second (cps), and Model 12 has a speed of 120 characters per second. The 5103 printer prints uppercase and lowercase characters, numeric characters, and special symbols. It prints in both directions (left to right and right to left), thereby reducing print time.

The 5120 system has a print overlap capability; that is, certain calculations and the printing of output can occur at the same time. For example, the 5110 Model 3 can be calculating an extended price (unit price times quantity) while the printer is printing the results of a previous calculation. This overlap of functions increases the speed with which the system completes a job.



The 5114 diskette unit

By adding one 5114 diskette unit with either one or two diskette drives to your system you can increase your total online diskette storage capacity to a maximum of either 3.6 or 4.8 million bytes.



Programming languages

You can choose APL, BASIC, or both languages for your system. If you choose only one language initially, you can add the other language later.

BASIC

The name BASIC stands for Beginners All Purpose Symbolic Instruction Code. The key terms in the name are Beginners and All Purpose. BASIC, as its name implies, is designed for the person who requires a direct, understandable programming language to satisfy the needs of a business.

Because of its structure, BASIC allows you to feel comfortable with the language almost immediately. Then, as you gain confidence, you can proceed to the more sophisticated functions of the language. For example, BASIC can be used to print an invoice, evaluate compound interest problems, or work a complex engineering problem, depending on your needs.

The BASIC language is composed of a series of commands and statements. What you enter tells the system what you want done and how you want it done. By their names, BASIC statements and commands imply the action they perform. For example, the PRINT statement tells the system to print data, and the INPUT statement allows you to enter data from the keyboard. Thus, the elements of the BASIC language speak for themselves.

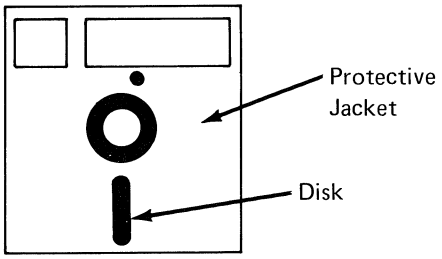
APL

The name APL stands for A Programming Language. The APL language is particularly well-suited for scientific, engineering, and research applications; it also adapts easily to business applications. Most APL users require and use only a small subset of the total APL language to develop their own functions. Many shortcuts allow you to express complex functions with a single keystroke. APL proves that a programming language can be both powerful and easy to use.

Diskette storage

The IBM diskette is a thin, flexible disk permanently enclosed in a protective plastic jacket. The disk and the jacket together are referred to as a diskette.

Each diskette contains up to 1.2 million bytes of storage that can be accessed quickly. When you use diskette storage, you can have multiple open data files on the same diskette drive, and you can access individual records in these files at random.



Diskette

Because it is removable, the diskette allows you to exchange data with other systems. Your IBM marketing representative can give you a complete list of compatible systems.

An overview of the IBM 5120 Computing System

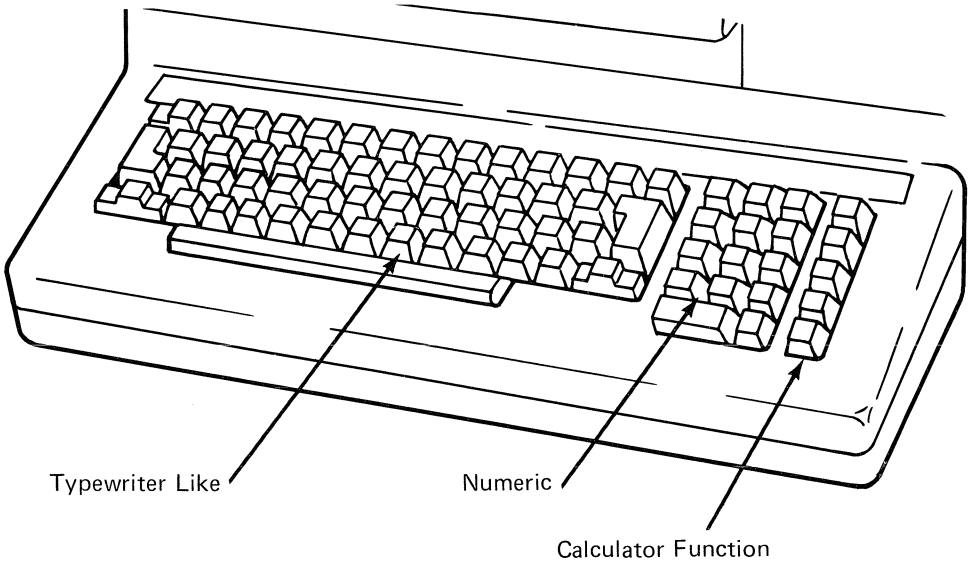
Operating characteristics

The installation of the 5120 computing system places few demands upon the physical facilities of your office. Also the operation of the system should require no additions to your professional staff because the system is designed for the business person who has little or no computer experience.

Many operating aids are standard in the design of the system to eliminate any requirements for a computer data processing professional. Knowledge of fundamental computer data processing concepts, plus training on the system, is sufficient background to permit confident operation of the system. Frequently, an employee responsible for bookkeeping or other clerical duties can learn how to operate the system.

System operating aids include:

- *Familiar keyboard design.* The 5110 Model 3 keyboard features a standard typewriter-like arrangement. The keyboard also contains a cluster of 10 numeric keys and calculator functions arranged like a standard adding machine. These familiar key arrangements aid in the rapid keying of information.



- *Keyboard function and command keys.* The keyword keys and command key are easily identified. By using the keyword keys with the command key, you can request specific functions and enter character combinations with a single keystroke. For example, you can enter words such as PAUSE, PRINT, RESET, and USING by depressing one key.

- *Simplified control statements.* You can control the system operation by using short, simple control statements. These statements, called "command statements", are composed of familiar, easily understandable terms such as ALERT, LIST, MERGE, and SAVE. You can, therefore, avoid the highly technical control language normally used by a computer system.

- *Customer support functions.* A set of customer support functions come with the system and perform routine tasks for you. For example, the copy function copies selected information from one diskette to another, thus allowing you to produce extra copies of your business information for audit and control purposes or for mailing to other locations.

- *Continuous system-to-operator communication.* The display screen provides a means for communication between you and the system. As you enter information on the keyboard, you can visually verify it on the screen. Also, the system displays messages to you on the screen. These messages can request input from you or identify keying errors that the system has detected.

- *Diskette storage.* You can save data and programs on magnetic diskettes for later use. This means you do not have to rekey information into the system each time the system is used.

Chapter 2. System options

Introduction

The options available for your 5120 computing system let you select a system that meets your data processing requirements today and plan for those of the future. For example, you can select a storage capacity and printer speed that accommodate current data files and printing applications and, at the same time, are sufficient for anticipated volumes of data. You can, of course, increase your storage capacity and printing speed as new requirements arise.

Some options are features that you can get when you buy your system or later when the need arises. Other options are products for use with the system or services that can help you get the most out of your system.

These optional features allow you to increase the capabilities of your system:

- Diskette sort is a productivity tool for the programmer.
- Communications allow you to send data to and receive data from remote computers or terminals.
- Serial I/O allows you to accept data from another device or provide data to another device.

These optional products and services are available to you:

- Application programs
- Supplies
- Education
- Maintenance agreement

System options

Optional features

The following optional features are available for your 5120 computing system:

- Diskette sort
- Asynchronous communications
- Binary synchronous communications
- Serial I/O adapter

Specifications for these features are in Appendix A. Your IBM marketing representative can help you select the features that meet your data processing needs.

Diskette sort

With the Diskette Sort feature, you can sort diskette records in either ascending or descending sequence. Up to six fields of not more than 64 characters total can be sorted with the feature. You can create a new diskette file containing the sorted records, or you can create a diskette file containing just the sorted record addresses (address out sort).

This feature is valuable if your business operations entail frequent sorting and reporting of records. You can rapidly obtain sorts such as:

- Sequencing incoming checks by check number, customer number, or amount.
- Ordering payroll files by names, employee number, or age.
- Inventorying items by part number, stock number, or price.
- Performing sales analysis reporting, ordering sales by salesman, territory, or amount sold per salesman.

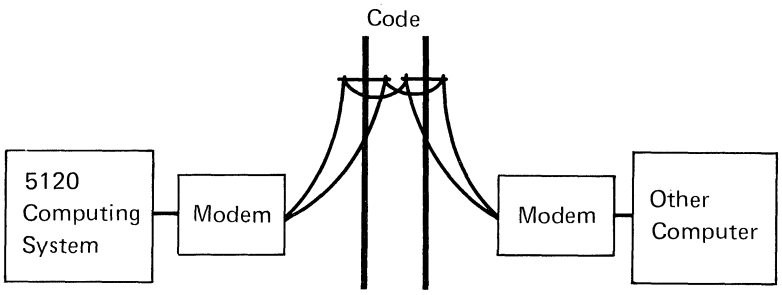
Communications

Computers don't "talk" to each other by telephone the way that people do. Instead of voices, computers use code to communicate information. The 5120 computing system's communications features handle various standard computer codes (such as EBCDIC, etc.).

For computers to talk to each other, they must speak the same language. This means that the computers must use the same code, have the same type of communications features, and operate at the same speed. Speed is referred to as bits-per-second (bps).

In addition to code, feature type, and speed—computer communications are also dependent on distance. Communications features are designed to handle computers that are far enough apart (remote) to require special communications or telephone lines.

Distance between the computers affects the quality of the electrical signals that carry the code. For this reason, modems (a device that connects a computer to communications lines) must be used. A modem amplifies the signals and puts them in a form the communications lines can handle. At the receiving end of the communications line, another modem changes the signals back to the form used by the computer.



The 5120 computing system uses two different communications features to talk to other computers. They are the Asynchronous Communications feature and the Binary Synchronous Communications feature.

Asynchronous communications The Asynchronous Communications feature, allows your 5120 computing system to transmit data to and receive data from a host system that is equipped with asynchronous communications.

Note: The Asynchronous Communications feature cannot be used while the Serial I/O Adapter feature is being used.

Binary synchronous communications The Binary Synchronous Communications (BSC) feature allows your 5120 computing system to expand by communicating with

another computing system, another data processing terminal, or another 5120 computing system that is equipped with binary synchronous communications.

Serial I/O adapter

The Serial I/O Adapter feature allows you to transfer data between your system and a variety of external input/output devices, such as:

- Plotters and graphic displays
- Card readers and/or punches
- Printers
- Instrumentation devices

Only one input/output (I/O) device can be attached to the serial I/O adapter at a time, and the device must supply its own power.

Note: The Serial I/O Adapter feature cannot be used while the Asynchronous Communications feature is being used.

Optional products and services

The following optional products and services are available:

- Application programs
- Supplies
- Education
- Maintenance

Your IBM marketing representative can help you select the products and services that meet your data processing needs.

Application programs

The 5120 computing system is supported by a number of application programs that can supply solutions to some of your business problems. These application programs satisfy a variety of data processing requirements from general accounting to specific industry solutions.

Supplies

The following items are available for your 5120 computing system:

- Printer ribbons
- Printer forms
- Diskettes
- Forms stand

Education

Training and confidence are essential if you are to use a computing system effectively. Even though the operation of the 5120 computing system requires only a minimum of computer knowledge and training, education is available to you to ensure productive use of your system.

Maintenance agreement

From the laboratory through manufacturing and delivery, IBM emphasizes quality in its products in order to provide the best possible performance. To help ensure *continued* performance, IBM offers a maintenance agreement.

With an IBM Maintenance Agreement, you can expect:

- Service. No scheduled preventive maintenance is required; however, an IBM customer engineer is assigned to your installation to service your system if needed.
- IBM commitment. IBM is committed to have adequate manpower, skills, and parts available to sustain machine performance.
- Equipment improvements. Engineering changes that improve safety and reliability are distributed from IBM plants and automatically applied to your system by a customer engineer.
- Plant support. Every modification made to your system is recorded in a machine history. This history is used by IBM to determine future improvements to your system.
- Stable maintenance costs. There are no unexpected charges for service or expensive parts.

Chapter 3. Site preparation information

Introduction

This chapter provides the information that you need to select a site for your system and get it ready before your system arrives. Appendix A has additional detail that your electrician or other technical contractor can use.

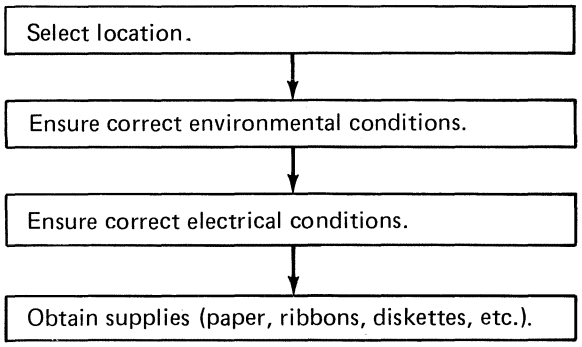
On the next page is a chart showing the sequence that you should follow while getting ready for your system. It also shows the sequence that you will follow after your system arrives.

After you review the chart, read "Getting ready for your system". It lists the main points you should consider in deciding where to place your system. The rest of the chapter gives you specific information that you will need. If you need more detail than is in this chapter, refer to Appendix A.

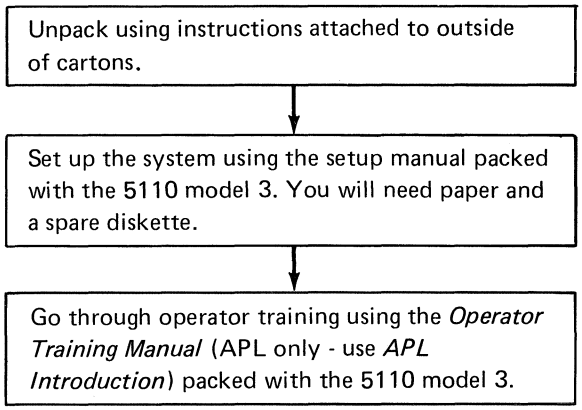
Site preparation information

Preparation and setup sequence

Before delivery of your 5120 Computing System



After delivery of your 5120 Computing System



Getting ready for your system

When deciding where to place your 5120 computing system, you should consider the following:

- Review the physical dimensions and the illustrations of the system in this chapter. Then, look for an area that provides enough work space.
- Be sure to plan for additional space to store supplies, files, and so forth.
- Place your system in an area that is convenient to the present work center. Be sure there is enough room to allow easy movement through the area.
- Choose a location that has normal office lighting and is free of distracting noises.
- Although air conditioning is not required for the system, you may want to consider it for your operators' comfort.
- Place your system where it can be protected from damage or misuse.
- Remember that some of the work done on the computer might be confidential. You might, therefore, consider locating the system in an area is secure and private.
- The system requires grounding. A 15-ampere, single-phase grounding service is required, along with a receptacle for each unit. The power cords on your system will be 1.8 meters (six feet) long, so plan ahead when locating power sources.

> **DANGER**
> You must have a 3-wire grounded electrical circuit. An ungrounded system will not work properly and may be a safety hazard.

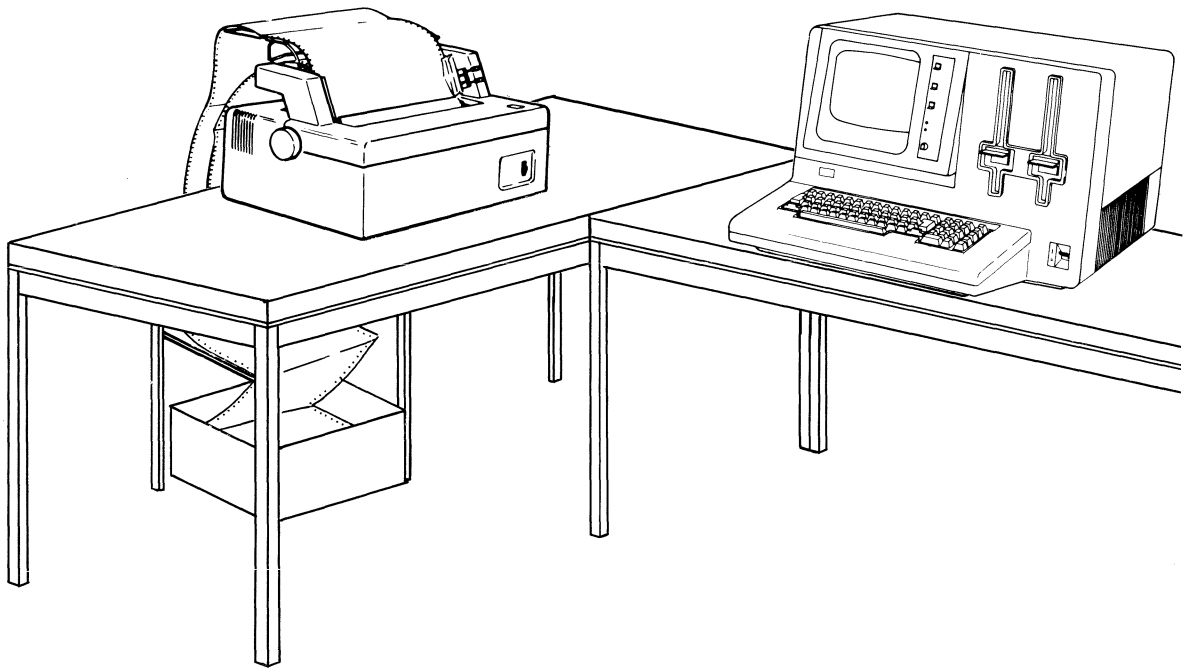
Site preparation information

Typical arrangement of units

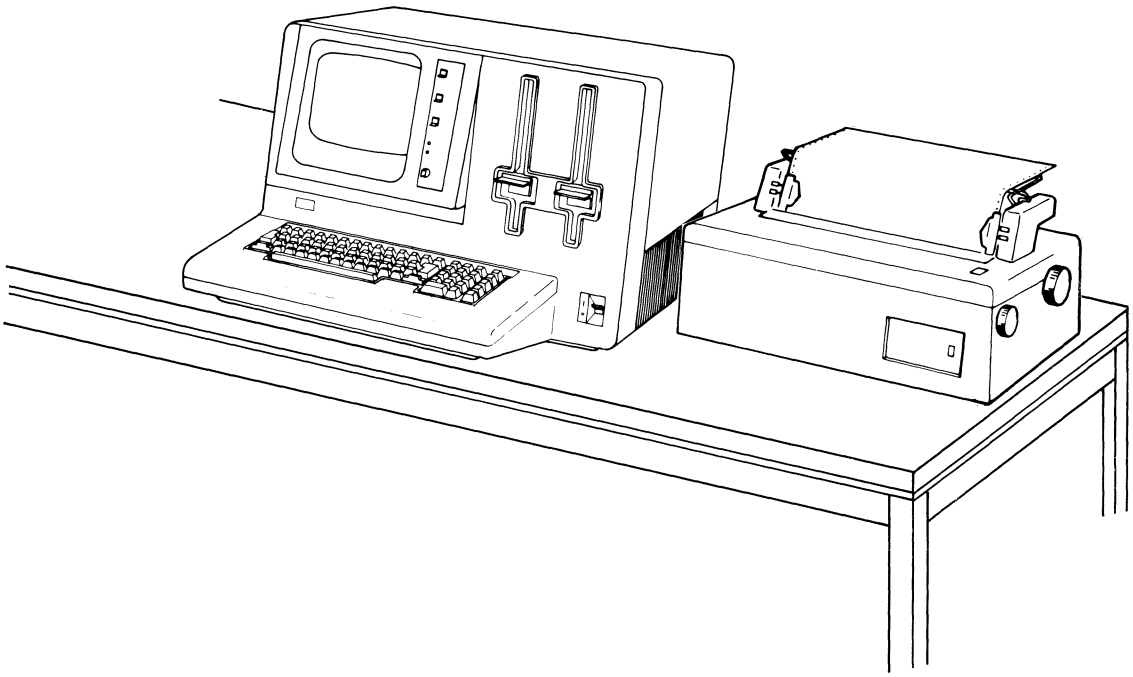
Arrange the units conveniently. When you plan your arrangement, remember that:

- The signal cable from the 5114 diskette unit is 1.2 meters (4 feet) long, measured from the point where it leaves the unit (see "Cabling" in this chapter).
- The signal cable from the 5103 printer is 1.2 meters (4 feet) long measured from the point where it leaves the unit (see "Cabling" in this chapter).
- Power outlets must be within 1.8 meters (6 feet) of the point where the power cords leave the units.
- The area around the units must be adequate for service access (see "Physical specifications" and "Service access space requirements" in this chapter).
- The keyboard should be placed at typing table height (approximately 680 mm (27 in)) for operator comfort.

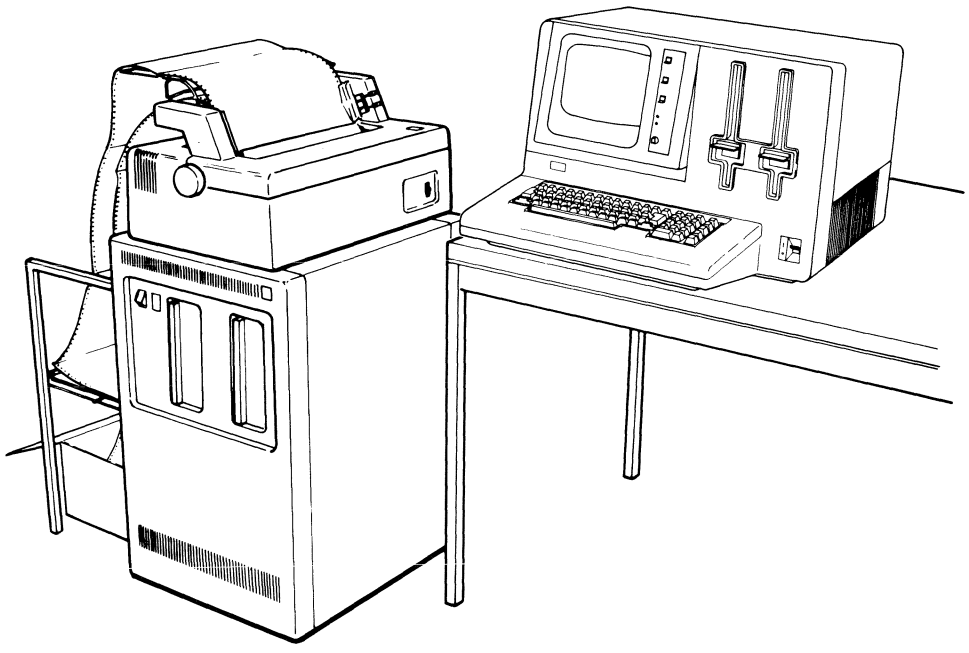
The illustrations on these 2 pages show arrangements that work. After you have read the rest of this chapter, decide on an arrangement that will satisfy your needs. Make a plan or sketch of your arrangement to guide the placement of the units when your system arrives.



5110 Model 3 Computer With 5103 Printer



5110 Model 3 Computer with 5103 Printer

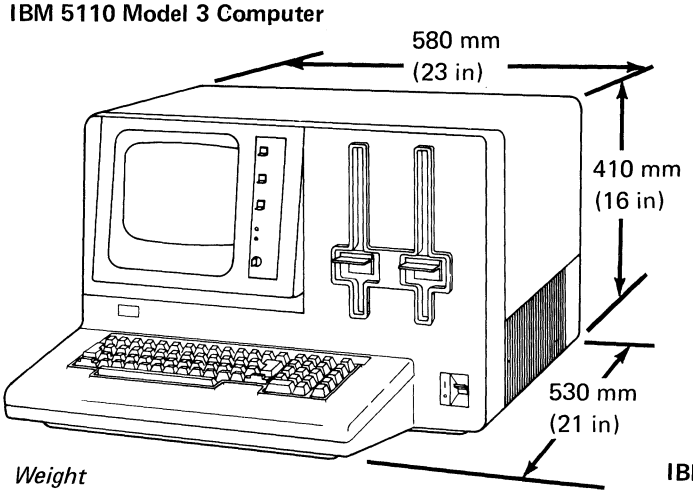


5110 Model 3 Computer with 5114 Diskette Unit and 5103 Printer

Site preparation information

Physical specifications

IBM 5110 Model 3 Computer



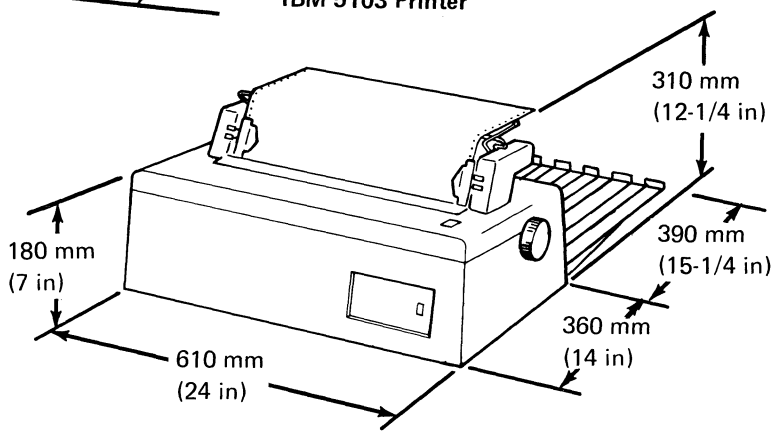
Weight

48 kg (106 lb)

Power Cord

1.8 m (6 ft)

IBM 5103 Printer



Weight

25 kg (55 lb)

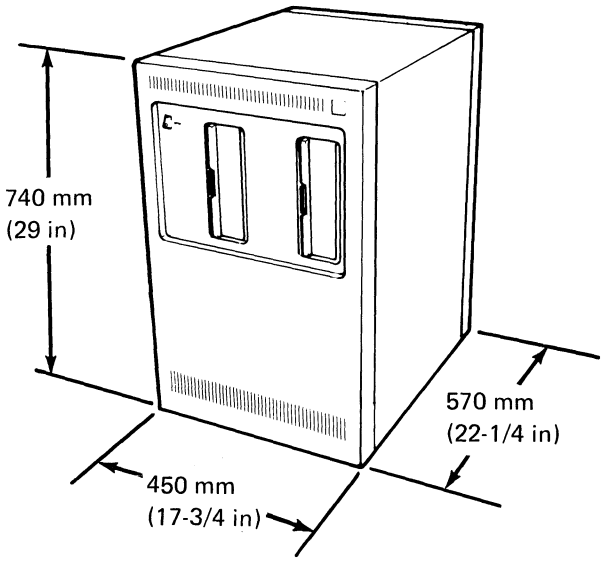
Power Cord

1.8 m (6 ft)

Signal Cable

1.2 m (4 ft)

IBM 5114 Diskette Unit



Weight

With One Diskette Drive	53 kg (116 lb)
With Two Diskette Drives	60 kg (132 lb)

Power Cord

1.8 m (6 ft)

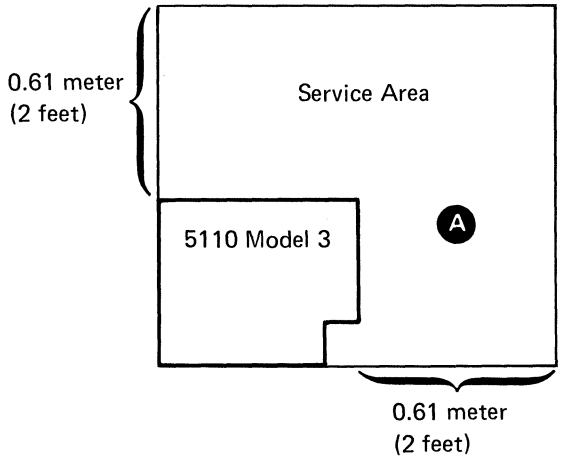
Signal Cable

1.2 m (4 ft)

Service access space requirements

When deciding where to place your 5120 computing system, remember that it may require servicing at some future time. Therefore, when selecting your site, please follow these general rules:

- If your 5110 Model 3 will be bolted in place Ⓐ, you must allow a minimum service access space of 0.61 meter (2 feet) to the rear and 0.61 meter (2 feet) to the right side of the computer.
- If your 5110 Model 3 will not be bolted in place Ⓑ or Ⓒ, allow a minimum service access space 0.30 meter of (1 foot) to the rear and 2 feet to either the right or left side of the computer.
- The 5114 diskette unit and the 5103 printer do not need service access space. However, be sure you have room to put paper in the printer. Allow access to the rear of the printer so you can move any boxes of paper.

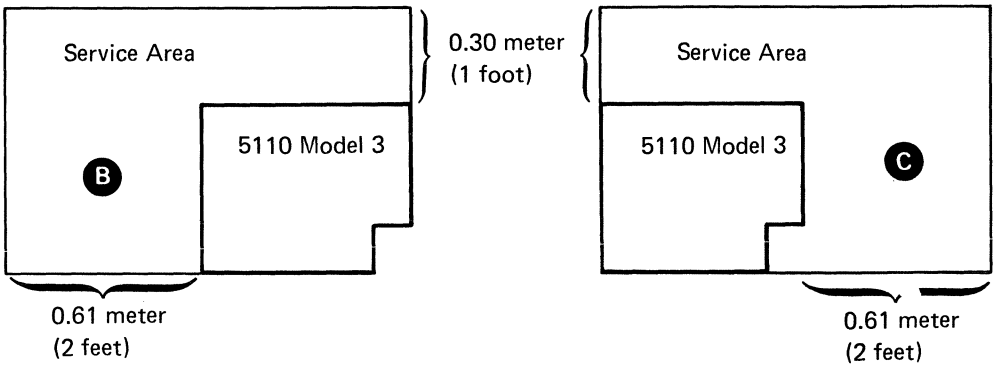


The service areas are shown at a scale of 1 cm = 25 cm (.5 inch = 1 foot (approx)).

Ⓐ Bolted in place

Ⓑ Not bolted in place (left side clearance)

Ⓒ Not bolted in place (right side clearance)



Site preparation information

Cabling

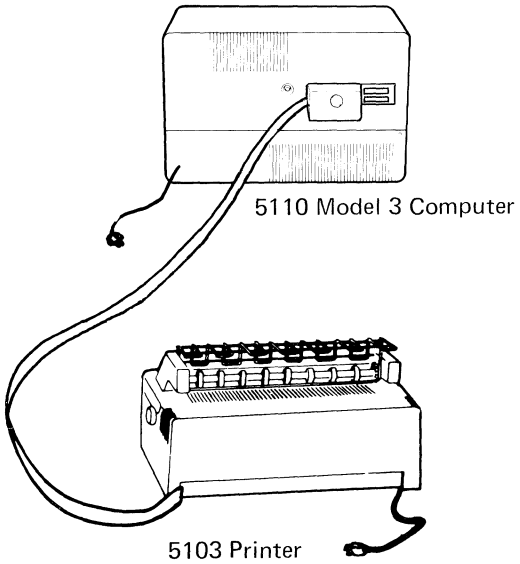
Each unit is supplied with a 1.8 meter (6 foot) power cord. The following units have signal cables:

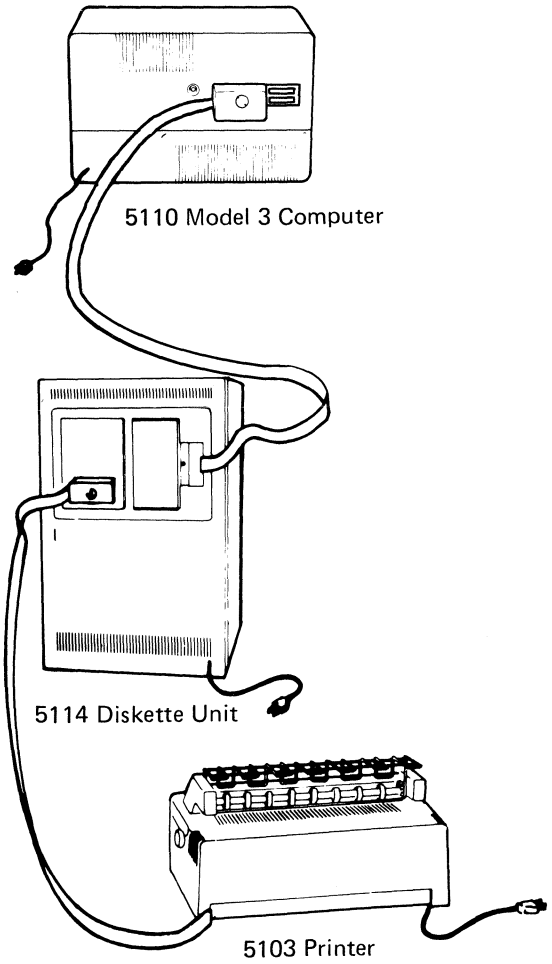
Unit	Signal Cable Length
5114 diskette unit	1.2 meters (4 feet)
5103 printer	1.2 meters (4 feet)

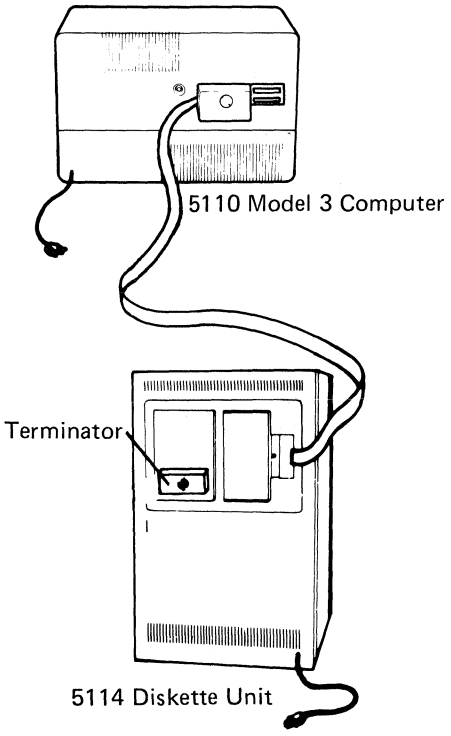
The illustrations on these pages show each possible combination of the units. You must connect the units as shown for the system you have purchased. The following rules apply:

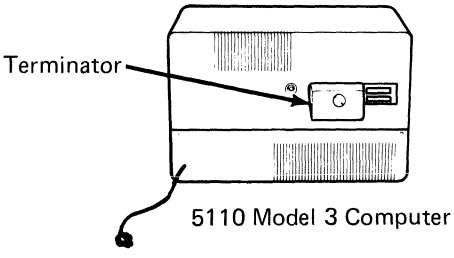
- The 5114 diskette unit can only be attached to the 5110 Model 3.
- The 5103 printer must be the last unit attached.
- The channel terminator must connect to the last unit if you do not connect a 5103 printer.

The following illustrations (rear view) show how the signal cables are connected between units:




5110 Model 3 Computer
5114 Diskette Unit
5103 Printer


5110 Model 3 Computer
Terminator
5114 Diskette Unit


Terminator
5110 Model 3 Computer

Site preparation information

Environmental and electrical requirements

Environmental requirements

Operating environment

Dry bulb temperature	15° - 32°C (60° - 90°F)
Relative humidity	8% - 80%
Maximum wet bulb temperature	23°C (73°F)

Nonoperating environment

Dry bulb temperature	10° - 43°C (50° - 105°F)
Relative humidity	8% - 80%
Maximum wet bulb temperature	27°C (80°F)

- These environmental requirements are satisfied in most offices. If the place where you plan to put the system seems unusual, you should check for proper environment.

- The operating conditions listed are maximum limits; good design dictates that the environmental conditions should be maintained near the center of the range. In particular, the relative humidity should be maintained above 30% to guard against intermittent errors caused by static discharge from high static floor coverings.

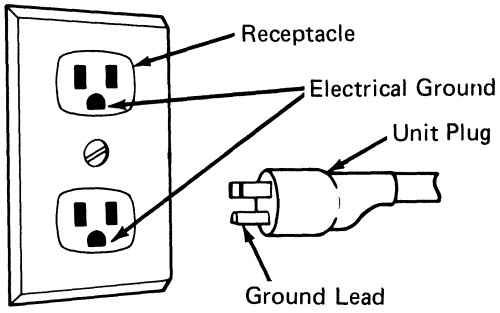
Note: The 5110 Model 3 computer contains two diskette drive units that use magnetic reading/writing methods. To ensure correct operation of the system, sources of electromagnetic energy such as TVs, other display terminals, video monitors, or another 5110 Model 3 must not be installed within 0.6 meters (two feet) of the 5110 Model 3.

Electrical requirements

The system requires 15-ampere, single-phase 3-wire grounding service, along with a receptacle for each unit. All power cords are 1.8 meters (6 feet) long.

> **DANGER**
> The importance of a grounded electrical circuit requirement cannot be over emphasized—an ungrounded system will not work properly and can be a safety hazard.

The following illustration shows the grounded outlet and plug that is used in several countries. Each type of plug has a means of grounding that must *not* be bypassed by an adapter.



Make sure you have grounding electrical circuits available for your system. If you do not use grounding electrical circuits, you could experience:

- Intermittent machine failures
- Improper program operation
- Unreadable diskettes
- Expensive machine damage

The 5120 system is designed to use many standard 50 and 60 hertz voltages. Specific electrical requirements are given in Appendix A, "Specifications".

The 115-volt 60 hertz power plug on the 5114 diskette unit has a tap for electrical power so that a printer, video monitor, or communications modem can be plugged in without using another outlet.

One of the plugs shown in the following illustration will be installed on your machines.

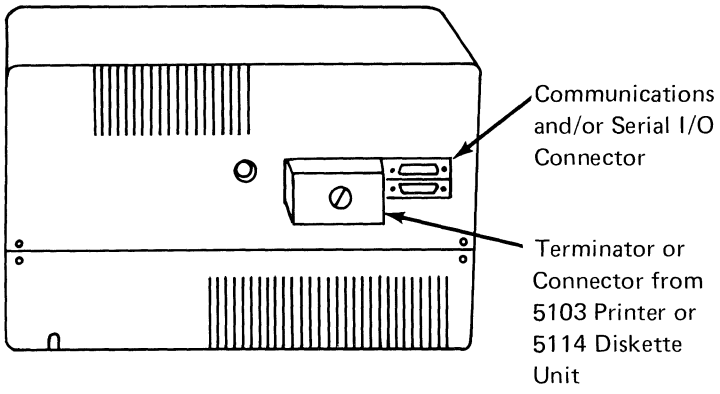
Plug	Country
	Brazil, Canada, Japan, Mexico, United States, Venezuela
	Switzerland
	Austria, Denmark, Germany, Finland, Netherlands, Norway, Spain, Sweden

Plug	Country
	Belgium, France, Italy
	United Kingdom
	Australia

Site preparation information

Prepare for features

Your 5120 computing system may include a communications feature and/or a Serial I/O Adapter. These features connect to the 5110 Model 3 through the connectors shown below.



Communications

You can obtain modem specifications for your system from your IBM marketing representative. Also contact your local communications common carrier company (for instance, the telephone company) representative to allow them adequate time to hook up your equipment.

Cabling for Asynchronous Communications. A 1.8 meter (6 foot) modem cable comes with the Asynchronous Communications feature. It connects to the modem through a 25-pin modem plug that is compatible with AMP #205208-1 plug or equivalent.

Cabling for Binary Synchronous Communications. A 6.09 meter (20 foot) cable comes with the Binary Synchronous Communications feature. It connects to the modem through a 25-pin modem plug that is compatible with a Cinch or Cannon type DB-19604-433 plug.

Serial I/O Adapter

This feature conforms to the EIA RS-232-C/CCITT V.24-V.28 specifications. Two 1.8 meter (6 foot) cables are supplied with the feature. One, with an AMP #205207-1 or equivalent receptacle, is used when the 5120 computing system is used as data communications equipment. The second, with an AMP #205208-1 or equivalent plug, is used when the 5120 computing system is used as data terminal equipment.

Diskette sort

The diskette sort feature is inside the 5110 Model 3 and does not require any special consideration.

Site preparation information

Ordering supplies

You will need some supplies for your new computer. Use this simple checklist to be sure you're on the right track.

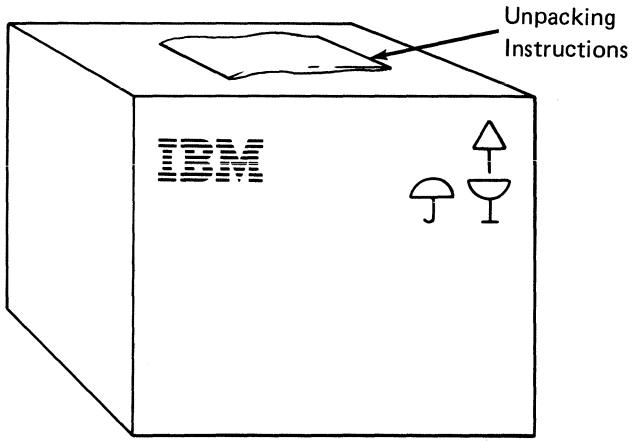
- ☐ Diskettes: Plan to have at least ten 2D diskettes on hand to hold your backup data and to use as replacements.
- ☐ Printer ribbons: Printer ribbons are required for the printer. Keep several extra on hand.
- ☐ Printer paper: Standard computer printer paper is an 11"x14-7/8" continuous form. It is available in many different formats and colors. If you need more than one copy of reports, consider buying multipart paper.
- ☐ Preprinted forms: Depending on the application programs you have selected for your system, you may wish to use preprinted forms. These forms are available for checks, earnings statements, invoices, statements, etc. Preprinted forms are optional for some applications.
- ☐ Binders: Special binders are available to keep computer printouts neat and orderly.

You may purchase your supplies from IBM or from any other vendor who meets your needs. To order from IBM, look in your local "white pages" under IBM Corporation—Supplies or Information Records Division. Also, your local IBM Business Computer Center may have some supplies available.

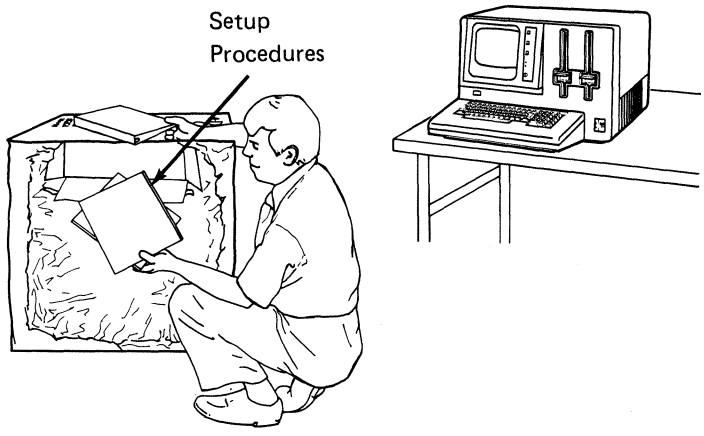
When your computing system arrives

The 5120 computing system is designed with ease of customer setup in mind. Step-by-step instructions, packed in the shipping container, enable you to set up and check out your system immediately upon arrival without the assistance of a service representative. You will also find these instructions helpful if you decide to move the system in the future.

Unpacking instructions, which will be on the outside of each shipping carton, will guide you as you unpack the units and put them in place. Some of the units are heavy (up to 60kg (132 lb)), so you will want some help when you lift them.



Packed with the 5110 Model 3 computer is the *IBM 5120 Computing System Setup Procedure,* SA34-0131. This manual will guide you as you connect the units and check them out. You will need printer paper and a diskette for the check-out procedures. The diskette must be an unused pre-initialized diskette. It must not contain a program or data that you want to use later.



Appendix A. Specifications

Electrical Specifications

AC voltage requirements—USA and Canada

The voltage requirements for the 5110 Model 3 computer, 5103 printer, and 5114 diskette unit are the same.

Frequency	Frequency tolerance	Voltage	Voltage tolerance
60 Hz	±1/2 Hz	115 Vac	±10%

AC voltage requirements—Other countries

The rated voltages of the 5103 printer and 5114 diskette unit differ slightly from the rated voltage of the 5110 Model 3 computer. However, because of voltage tolerances, all the machines in the system are compatible. All the units match the following requirements.

Frequency	Frequency tolerance	Voltage	Voltage tolerance
50 Hz	±1/2 Hz	100 Vac	±10%
50 Hz	±1/2 Hz	220 Vac	+8%-12%
50 Hz	±1/2 Hz	240 Vac	+8%-12%
60 Hz	±1/2 Hz	100 Vac	±10%
60 Hz	±1/2 Hz	120 Vac	+6%-13%

Power requirements and heat output

Machine type	Maximum KVA	Maximum Watts	Heat output (BTU per hour)
5110 Model 3 Computer	0.58	516	1774
5103 Printer	0.2	120	410
5114 Diskette Unit	0.4	175	600

Specifications

Feature specifications

Asynchronous communications

Item	Specification
Control type	IBM 3741 data link control or IBM 2770 data link control
Data rates	134.5 or 300 bits per second
Data codes	EBCD (extended binary coded decimal) or correspondence code
Modem required	External
Modem Cable	EIA RS232C/CCITT V.24 V.28 interface standard
Limitation	It cannot be used while the Serial I/O feature is in use.

Binary synchronous communications

Item	Specification
Control type	IBM 2741 Communications Terminal data link control
Data rates	Up to 4,800 bits per second
Data codes	EBCDIC (extended binary coded decimal interchange code) or EBCDIC transparency
Communications channels	Switched point to point, non-switched point to point, or multi-point (as a tributary station only)
Modems required	IBM 3863, 3868, 3872 Model 1, or 3874 Model 1 or equivalent
Modem Cable	EIA RS232C/CCITT V.24 V.28 interface standard

Serial I/O Adapter

Item	Specification
Data Codes	5 bit - Baudot; 6 bit (+parity) EBCD (extended binary coded decimal); 7 bit (+parity) ASCII (American Standard Code for Information Interchange); 8 bit.
Limitations	Only one device can attached to system at a time. The device must supply its own power. It cannot be used while Asynchronous Communications feature is in use.

Specifications

Machine specifications

Main storage capacity

Stated capacity	Total byte storage
16K	16,384 bytes
32K	32,768 bytes
48K	49,152 bytes
64K	65,536 bytes

Diskette storage capacity

Machines	Capacity
5110 Model 3	2.4 million bytes
5110 Model 3 and 5114 diskette unit (one drive)	3.6 million bytes
5110 Model 3 and 5114 diskette unit (two drives)	4.8 million bytes

Diskette drive timing

Action	Rate
Read data	48,000 bytes per second
Write or verify data	18,900 bytes per second
Data transfer	62,500 bytes per second
Average access time	0.25 second

Appendix B. Publications summary

5120 computing system

The following manuals describe the 5120 computing system:

IBM 5120 Computing System General Information and Site Preparation, GA34-0130 (this manual).

- Contains an overview of the physical characteristics and the operating characteristics of the system
- Summarizes the options and services related to the system
- Provides site preparation information for the System
- Provides technical specifications for the system and its options

IBM 5120 Computing System Setup Procedure, SA34-0131.

- Contains information for setting up the 5120 computing system for operation
- Consists of a step-by-step procedure for setup by customer personnel

IBM 5120 Computing System Operator Training, GA34-0132.

- Describes operations performed by operators using the 5120 computing system
- Provides training for operators using a system which has the BASIC language
- Contains information for operators using a system which has the APL language who are familiar with Chapter 1 of the *IBM 5110 APL Introduction*

Publications summary

5110 and 5120 computing systems

The following manuals describe both the 5110 and 5120 computing systems:

IBM 5110 Customer Support Functions Reference Manual, SA21-9311

- Contains information for users who know how to operate the 5110 and 5120 computing systems
- Describes procedures for additional operations that can be used with the 5110 and 5120 computing systems
- Describes the Diskette Sort feature.

IBM 5110 APL Introduction, SA21-9301

- Contains information for operators who need to become familiar with keyboard operation
- Contains information for users who want to learn the APL programming language
- Provides background information about APL and prepares the user for the *IBM 5110 APL Reference Manual*

IBM 5110 APL User's Guide, SA21-9302

- Contains information for users who are familiar with the *IBM 5110 APL Introduction*
- Provides concepts about the APL language, data processing, and the use of diskettes

IBM 5110 APL Reference Manual, SA21-9303

- Contains information for users who are familiar with the *IBM 5110 APL Introduction*
- Provides specific information about using the 5110 and 5120 computing systems with the APL language

IBM 5110 BASIC Introduction, SA21-9306

- Contains information for users who want to learn the BASIC programming language
- Provides background information about BASIC and prepares the user for the *IBM 5110 BASIC Reference Manual*

IBM 5110 BASIC User's Guide, SA21-9307

- Contains information for users who are familiar with the *IBM 5110 BASIC Introduction*
- Provides concepts about the BASIC language, data processing, use of diskettes, and report formatting

IBM 5110 BASIC Reference Manual, SA21-9308

- Contains information for users who are familiar with the *IBM 5110 BASIC Introduction*
- Provides specific information about using the 5110 and 5120 computing systems with the BASIC language

IBM 5110 Asynchronous Communications Feature User's Manual, SA21-9314

- Contains information for users who want to learn about the asynchronous communications feature
- Provides operating instructions and reference material for using the asynchronous communications feature with the 5110 and 5120 computing systems

IBM 5110 Binary Synchronous Communications Feature User's Manual, SA21-9316

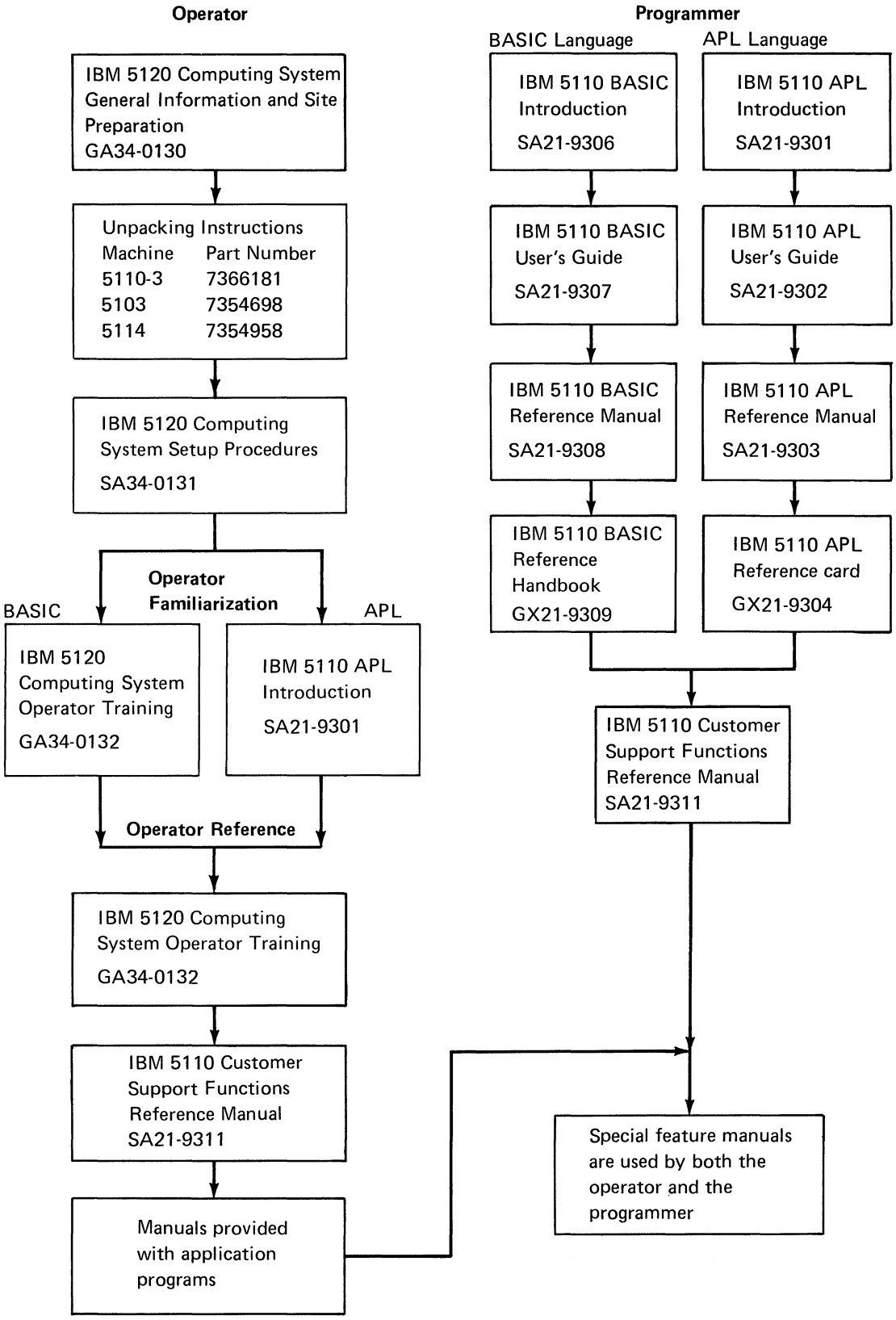
- Contains information for users who want to learn about the binary synchronous communications feature
- Provides operating instructions and reference material for using the binary synchronous communications feature with the 5110 and 5120 computing systems

IBM 5110 Serial I/O Adapter Feature User's Manual, SA21-9312

- Contains information for users who want to learn about the serial I/O adapter feature interface
- Explains how to use the 5110 and 5120 computing systems with the serial I/O adapter feature with APL or BASIC

Publications summary

Sequence of manual use



Glossary

access time. The time between when the 5120 computing system program tells the diskette drive to read or write data on a diskette and the storage device finds the location on the diskette where the data is to be read from or written to.

application program. A program designed to perform the steps required for a specific job. For example, a program that does your payroll.

asynchronous communications. Data communications between systems and/or devices using a start bit and a stop bit to indicate the beginning and the end of each character transmitted.

asynchronous communications adapter. Used to control asynchronous communications on the 5120 computing system.

audible alarm. An alarm that is activated when predetermined events occur that require operator attention or intervention for system operation.

binary synchronous communications (BSC). Data communications between systems or devices using synchronous transmission of binary coded data.

binary synchronous communications adapter (BSCA). Used to control binary synchronous communications on the 5120 computing system.

bit. The smallest unit of data in the 5120 computing system. Represented by a 1 or 0. Eight bits equal one byte.

BTU. British Thermal Units—the standard measure of heat output.

byte. The 5120 computing system representation of a character. Consists of eight adjacent bits.

cable. Two or more wires enclosed in a protective jacket. Cables are used to electrically connect the units of a 5120 computing system.

calculator functions. Add, subtract, multiply, and divide are calculator functions.

channel. A path along which signals can be sent, for example, data channel, output channel.

character. A letter, digit, or other symbol that is used as part of the organization, control, or representation of data.

character combinations. Several characters that work together to provide control to your computer. Examples are list, run, load. See *keyword*.

character set. The characters recognized and allowed by the APL or BASIC language.

command key. One of the keys in the top row of the keyboard which will enter a command when pressed while the CMD key is pressed.

common carrier. In the USA, a government-regulated private company that furnishes the general public with telecommunication service facilities; for example, a telephone or telegraph company. In other countries, common carriers may be government operated through such agencies as the post office.

Glossary

composite video adapter. A standard feature on the 5110 Model 3, it permits the information that is on the display to be shown on a TV monitor.

computer. A data processor that can perform numerous arithmetic or logic operations without the need for human intervention during the run.

computing system. A processing unit, with main storage, input/output channels, control units, direct access storage devices, and input/output devices connected to it.

control unit. The part that receives instructions in proper sequence, interprets each instruction, and applies the proper signals to the various parts of the computer.

customer support functions. Programs that can be used to aid you in operating your system.

data base. A collection of data fundamental to a system.

data communications network. A number of communications channels interconnecting a host with terminals and/or other hosts.

data file. A collection of data records organized in a specific manner.

data processing. The execution of a systematic sequence of operations performed upon data. Synonymous with information processing.

direct access storage device. A device in which the access time is effectively independent of the location of the data; for instance, a diskette.

diskette. A thin, flexible disk permanently enclosed in a protective plastic jacket that is capable of storing data and programs magnetically.

diskette data file. A portion of the storage on a diskette used to store information that is related. For example, the accounts payable for a business.

diskette drive. The device that reads data from or writes data to a diskette.

diskette storage. See *diskette.*

display screen. A TV-like screen which on the 5110 Model 3 measures 9 inches diagonally and permits visual verification of your data and programs.

dry bulb temperature. Temperature measured with a dry bulb thermometer.

external modem. A modem that is physically separated from the unit with which it operates.

file. A group of related pieces of information on diskette storage.

forms stand. An option which holds the forms after they leave the printer.

function. A predefined action. Copy display, insert, and delete are functions that can be entered into the system with one keystroke.

grounded conductor. A current-carrying conductor that is intentionally connected to ground.

grounded, single phase. The type of electrical service required for the 5110 Model 3.

grounding conductor. A conductor used to connect non-current-carrying conductive parts to ground for safety reasons.

host system. The data processing system to which a communication system is connected and with which the system can communicate.

input. Data entered from the keyboard, read from the diskette, received through a communications device, or received from a device attached to the Serial I/O feature that is processed by the 5120 computing system.

k. Usually an abbreviation for the prefix kilo, that is, 1000 in decimal notation. In this manual it is used to describe storage capacity of a binary memory; it means two to the tenth power or 1024 in decimal notation (this is the power of 2 closest to 1000). In use, 16K is 16 times 1024 or 16,384.

keyboard. A device used for entering data into the 5120 computing system.

keyword. A predefined word in BASIC and APL programming languages. A keyword key permits entry of the entire word with one keystroke.

KVA. Kilovolt Amperes-the measure of electrical power consumed.

M. An abbreviation for the prefix mega, that is, 1000000 in decimal notation. Therefore, 2.4M is equal to 2,400,000.

main storage. The part of the 5110 Model 3 where your data and programs are held while they are being processed.

modem. A device that is used to connect your 5110 Model 3 to a communications common carrier line. It allows your computer to "talk" to another computer.

online. Operating under the continual control of a computer.

open data file. A data file that is available to the program in the computer. It can supply information to be used in processing and can be updated as required.

output. Data that is displayed, printed, written on the diskette, transmitted through a communications device, or sent to a device attached to the Serial I/O feature.

pre-initialized. This refers to a diskette that has a predetermined format recorded on it. New diskettes purchased from IBM are pre-initialized.

print overlap. Printing data while the 5120 computing system continues to process other program statements.

processing. Performing specific operations on your data.

processing unit. The part of the 5120 computing system that includes the circuits controlling the interpretation and execution of the statements that makeup a program.

program. A series of statements that achieve a certain result.

programming language. An artificial language established for expressing computer programs.

record(s). A collection of related items of data, treated as a unit.

run. A single, continuous performance of a computer program or routine.

serial I/O. A method of communication between a computer and an input or output device. Data is moved serially (bit by bit) as opposed to parallel (a whole byte at a time).

signal cable. The cable on the 5103 printer and the 5114 diskette unit which carries information between the computer and the printer or diskette unit.

sort. To place the records in a data file according to some predefined order.

system programmer. The person mainly involved in designing, writing, and testing computer programs.

terminal. A unit from which data can either enter or leave a computing network.

TV monitor. A device (similar to a television set) which is used to display all the information that is shown on the computers display screen. This permits several people to see what is displayed on the screen.

wet bulb temperature. Temperature measured with a wet bulb thermometer.

2D diskette. A type of diskette which makes use of the capabilities of the 5120 system. 2D means two-sided, double-density. To you it means that you can store up to 1.2M bytes (characters) of information on one diskette.

±. Plus or minus.

Index

Index

READER'S COMMENT FORM

GA34-0130-1

IBM 5120 Computing System General Information and Site Preparation Manual

Your comments assist us in improving the usefulness of our publications; they are an important part of the input used in preparing updates to the publications. IBM may use and distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

Please do not use this form for technical questions about the system or for requests for additional publications; this only delays the response. Instead, direct your inquiries or requests to your IBM representative or the IBM branch office serving your locality.

Corrections or clarifications needed:

Page Comment

Cut or Fold Along Line

Please indicate your name and address in the space below if you wish a reply.

Thank you for your cooperation. No postage stamp necessary if mailed in the U.S.A. (Elsewhere, an IBM office or representative will be happy to forward your comments.)

Reader's Comment Form

Cut Along Line

Fold and tape | Please Do Not Staple | Fold and tape

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IBM Corporation
Systems Publications, Dept 27T
P.O. Box 1328
Boca Raton, Florida 33432

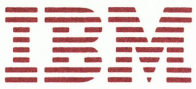
Fold and tape | Please Do Not Staple | Fold and tape

IBM®

International Business Machines Corporation
General Systems Division
4111 Northside Parkway N.W.
P.O. Box 2150, Atlanta, Georgia 30301
(U.S.A. only)

General Business Group/International
44 South Broadway
White Plains, New York 10601
(International)

GA34-0130-1
Printed in U.S.A.



International Business Machines Corporation

General Systems Division
4111 Northside Parkway N.W.
P.O. Box 2150
Atlanta, Georgia 30301
(U.S.A. only)

General Business Group/International
44 South Broadway
White Plains, New York 10601
U.S.A.
(International)

IBM 5120 Computing System General Information and Site Preparation Manual Printed in U.S.A. GA34-0130-1

GA34-0130-1