

THE WANG PROFESSIONAL COMPUTER

Introductory
Guide

Introductory Guide

WANG

The Wang Professional Computer Introductory Guide

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PREFACE

The Wang Professional Computer Introductory Guide is designed to help you understand how to use your Wang Professional Computer (PC). The guide provides you with four types of information:

- Descriptions of the Wang Professional Computer's major components and available options
- Procedures that describe the installation and expansion of your Wang Professional Computer system
- Instructions on how to operate your system
- Technical reference material about the Wang Professional Computer

Each chapter in the Introductory Guide discusses one major aspect of the Wang Professional Computer system. The topics presented in each chapter are summarized below.

Chapter 1 Introduction: Describes each of the Wang Professional Computer's basic components. Describes how the combination of Wang's product design and product support strategies help you use and maintain your system.

Chapter 2 Setting Up Your Wang Professional Computer: Presents instructions on how to unpack your system and connect its three major components.

Chapter 3 -- Getting Acquainted with Your Wang Professional Computer: Provides step-by-step instructions on starting the system, formatting diskettes, backing up diskettes, restarting the system, accessing a disk directory, and loading an application.

Chapter 4 -- Computer Concepts and Terminology: Explains the fundamental computer concepts and terminology that you should understand before you read subsequent chapters in the Introductory Guide. The concepts discussed include files, disk organization, external storage, prompts, and menus.

Chapter 5 -- Using Diskettes: Explains what a diskette is and describes the different types of diskettes you can use on the Wang PC. Lists the parts of a diskette and explains the function of each part. Describes how you should take care of diskettes.

Chapter 6 -- Using the Keyboard: Provides a description of the function of each key within the major keyboard groups.

Chapter 7 -- Using the Wang PC System Screens: Describes each of the Main System Menu options. Also includes instructions on how to run and load programs in the interpretive BASIC programming language.

Chapter 8 -- Using Your Winchester Disk Drive: Tells how to transfer information to and from the Winchester disk. Describes how to start and control your system from the Winchester disk.

Chapter 9 -- Electronics Unit Options: Describes each of the Wang PC option cards and provides a general installation procedure. Also provides step-by-step instructions for installing the Winchester drive, a second diskette drive, and the electronics unit desk clamp.

Chapter 10 -- Monitor Options: Tells how to connect a monitor other than the Wang Monochrome Monitor to your PC system. Describes how to assemble and attach the monitor arm.

Appendices: Present technical information about the Wang Professional Computer, including solutions to common problems; an explanation of the System Diagnostic tests; a system summary; lists of error messages and keyboard codes and their meanings; a list of all files on System Diskettes I and II; instructions on how to safely transport your system and change the voltage setting; procedures for installing a device driver and for customizing the system software; and a glossary of Wang PC terminology.

Use this manual in conjunction with The Wang Professional Computer Utility Programs User Guide.

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1

INTRODUCTION

Overview

Identifying Your System's Components

Preventing Problems

CHAPTER 1 INTRODUCTION

1.1 OVERVIEW

This Introduction is designed to acquaint you with your Wang Professional Computer. If you read the general information contained in the Introduction, you will find it easier to unpack, connect, and use your computer.

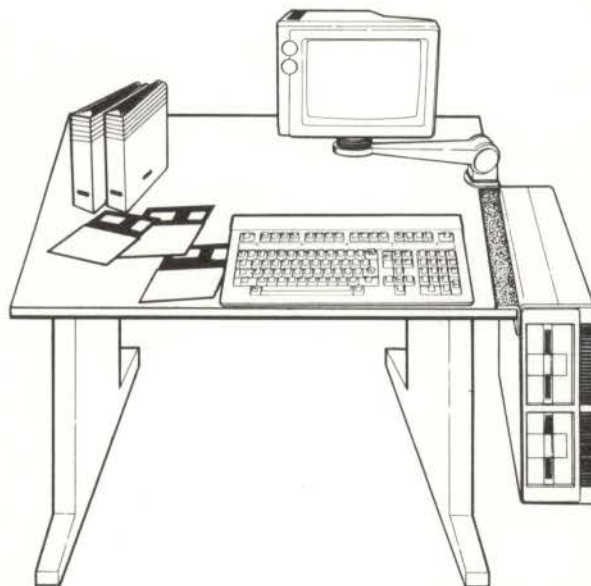


Figure 1-1. The Wang Professional Computer

The Introduction explains the importance of each of the major components that make up your Wang Professional Computer system. In addition, the Introduction describes the various kinds of resources you can turn to for help in solving problems that might arise as you begin to use your system.

The Wang Professional Computer is a multifaceted tool that you can use to solve business problems. With the appropriate software, you can collect, manipulate, and analyze any type of information. For example, with the Multiplan software available on the Wang PC, you can do complex spreadsheet analyses of budgets, acquisitions planning, and economic forecasting. Similarly, Wang PC Word Processing software uses the powerful capabilities of the computer to facilitate all aspects of your business communications needs. You can easily write, edit, and update letters, memos, and reports by using Wang PC Word Processing. In addition to using software packages such as Multiplan and Wang PC Word Processing, you can develop programs using various programming languages including BASIC, COBOL, FORTRAN, assembly language, and Pascal.

The Wang Professional Computer system blends neatly in any office space. It is easy to set up and easy to use. Most importantly, you can expand the capabilities of the Wang Professional Computer to meet your professional needs. You can expand its physical capabilities, add to its functionality, create new applications to solve your particular business problems, and integrate these expanded capabilities into all aspects of your work.

1.2 IDENTIFYING YOUR SYSTEM'S COMPONENTS

Your Wang Professional Computer system is made up of four basic components. Each of the basic components plays a vital role in the operation of your system. Of course, you can add additional components to your system to enhance its capabilities. However, your system is not complete until it includes each of the four basic components. These include:

- the keyboard
- the monitor
- the electronics unit
- the System Diskettes and manuals

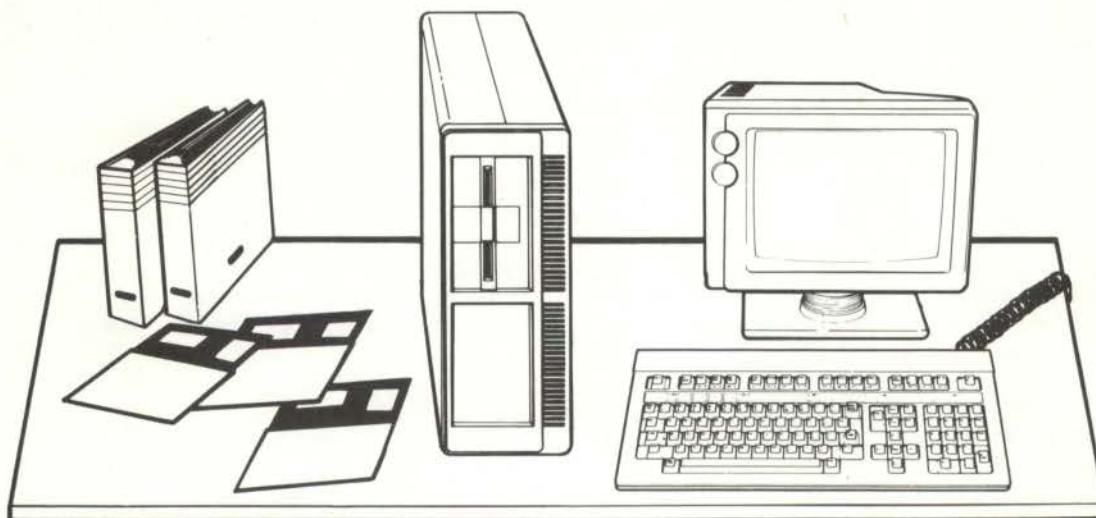


Figure 1-2. The Four Basic Components of the Wang PC

Although there are many possible ways to configure the Wang PC, every Wang PC is built upon a common foundation. This common foundation, known as the Base Unit, consists of the keyboard and the electronics unit with a single diskette drive, as shown in Figure 1-3. The Base Unit also includes System Diskettes I and II, the System Diagnostics diskette, The Wang Professional Computer Introductory Guide, The Wang Professional Computer Utility Programs User Guide, and The Wang Professional Computer BASIC Language Guide.

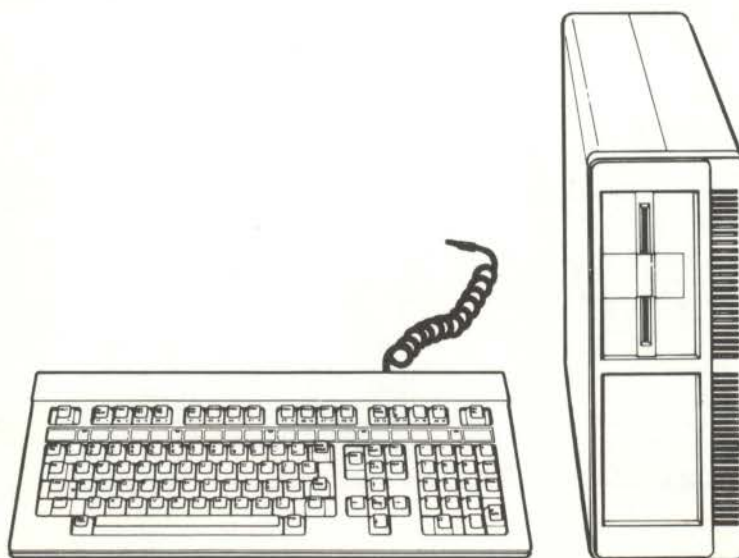


Figure 1-3. The Base Unit

With a Base Unit, you can select the type of video capabilities that match your needs. When you add a monitor to the Base Unit and install the appropriate video card, you complete your Wang Professional Computer system. You can use the Wang Monochrome Monitor, any black-and-white monitor, or any red-green-blue (RGB) color monitor. Chapter 9 describes the implications of using each type of video card. If you have a preconfigured system, the appropriate video cards are already installed within the electronics unit. All preconfigured systems use the Wang Monochrome Monitor.

You can install a second diskette drive or a Winchester disk drive within the electronics unit. You can also add more main memory, various communications facilities, Wang-supplied or system-compatible printers, and various software applications such as Wang PC Word Processing or programming languages such as FORTRAN.

Two accessories are also available to provide a unique method of incorporating the system into your office. The desk clamp allows you to attach the electronics unit to the side of your desk. The monitor arm raises the Wang Monochrome Monitor off your desk and allows you to swing it into position when you need it.

1.2.1 The Keyboard

You use the keyboard, shown in Figure 1-4, to communicate with your computer system. You give instructions to the computer by typing in characters, numbers, text, programs, or special keyboard commands. There are 101 keys on the keyboard. When you use these keys in all of their various combinations, you generate a set of 224 characters. (Refer to Appendix D.) A 6-foot coiled cable attaches the keyboard to the electronics unit. The keyboard weighs only 4 1/2 pounds, so you can easily position it as you work.

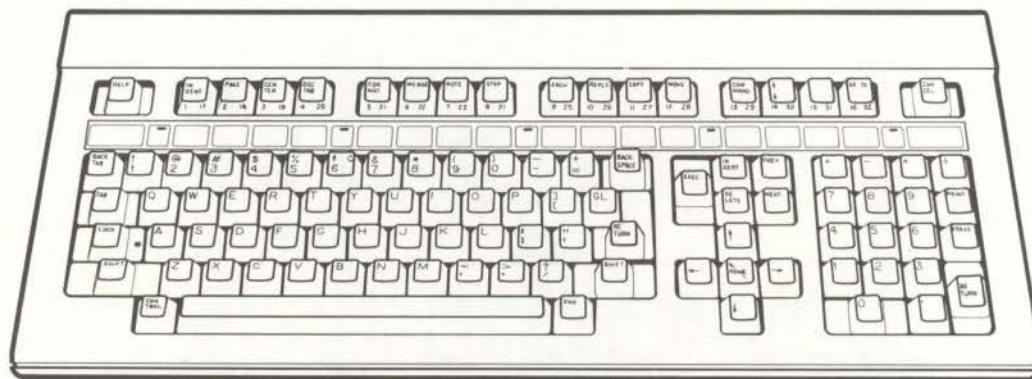


Figure 1-4. The Keyboard

Aside from the familiar typewriter keypad, your computer's keyboard has additional keypads and special keys. Chapter 6, Using the Keyboard, explains the function of each keypad and special key. In addition to the 101 keys, the keyboard has five red indicator lights (LEDs) built into it. Each time you turn on your system, a series of power-on diagnostic tests determine whether your system can start successfully. The LEDs are used to indicate the status of the system during these diagnostic tests. The tests run for approximately 15 seconds. If the tests detect no problems with your system, all of the LEDs go out and your system starts. If some of the lights remain on longer than 25 seconds, you should follow the procedures listed in Appendix B, System Diagnostics, to resolve the problem.

Inside the keyboard housing there is a 2-inch speaker that can be programmed to create up to three simultaneous tones. Sometimes these tones are used by the system to alert you to a problem. At other times, sounds provide helpful audio feedback. For example, each time you press a key, you hear a click that indicates that your computer accepts the particular keystrokes you have made. When you program in BASIC, you can use commands that generate sounds.

1.2.2 The Electronics Unit

The electronics unit is the central component in your system. It contains the microprocessor, memory, disk drives, expansion slots, System and option cards, power supply, and system clock. You connect all other Wang PC components to it. When you expand your system, you add an option card to the electronics unit. The electronics unit also contains all of the system's storage devices.

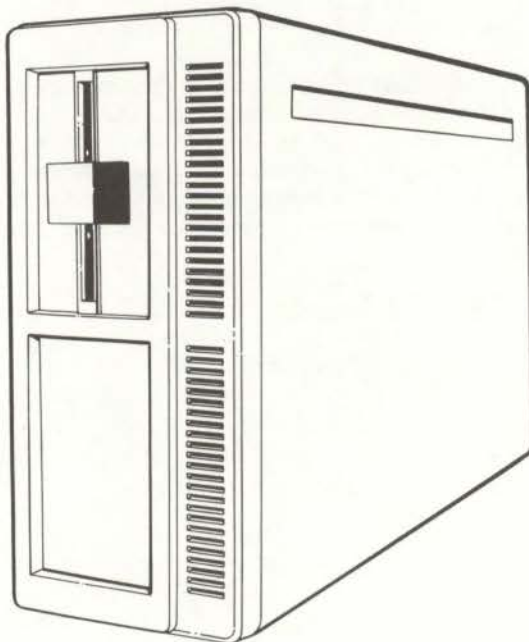


Figure 1-5. The Electronics Unit

The important parts of the electronics unit are as follows.

- System card
- disk drive(s)
- expansion slots

The following paragraphs discuss the function of each part. Appendix E, System Summary, contains a more technical description each one.

System Card: The System card is the circuit board in the electronics unit that contains the computer's main memory and main processing facilities. Figure 1-6 shows where the System card is located inside the electronics unit.

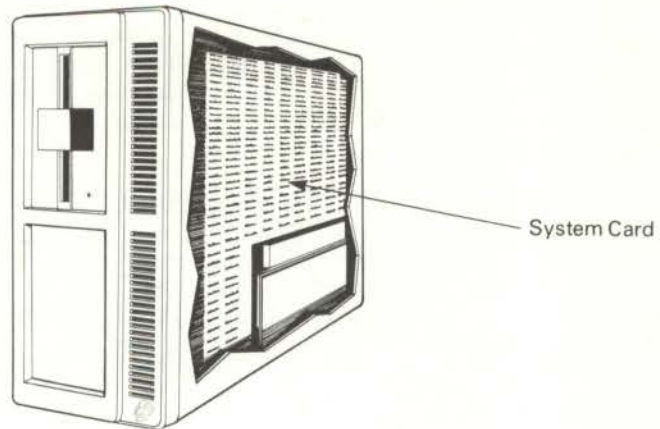


Figure 1-6. The System Card

Disk Drives: A disk drive is a device that allows you to store information electronically on a disk. Each disk drive contains a read/write recording head that functions much like the record and playback heads in a tape recorder. A disk drive's read/write head allows the computer to read information stored on a disk and transfer that information to main memory. The read/write head also enables the computer to write information stored in main memory onto a disk.

There are two types of drives that you can use in your Wang Professional Computer: a diskette drive and a Winchester disk drive. Your system could have a single diskette drive, two diskette drives, or a Winchester drive used in combination with a single diskette drive. (Refer to Figure 1-7.)

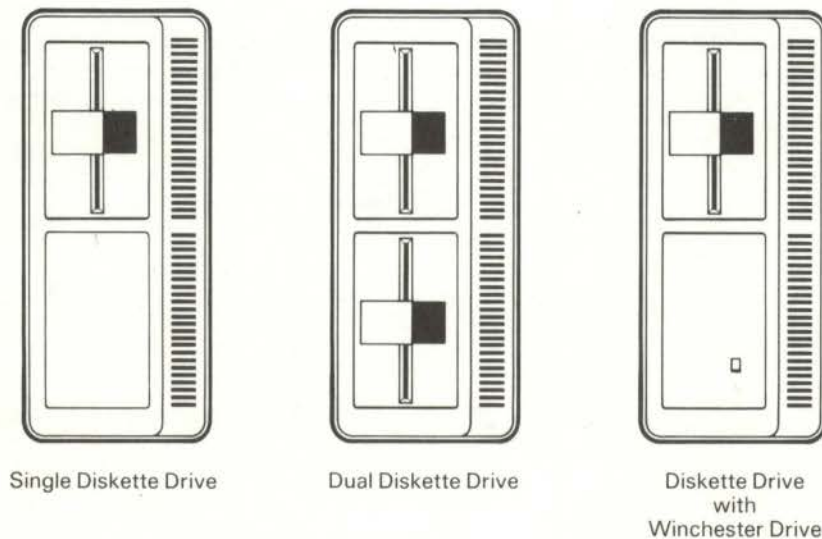


Figure 1-7. Disk Drive Configurations

The Diskette Drive: The diskette drive, shown in Figure 1-8, is an auxiliary storage device located in the electronics unit. The Wang PC diskette drives store information on 5 1/4-inch diskettes. Each Wang Professional Computer diskette stores 360,000 bytes (360KB) of information. In less technical terms, each diskette holds the equivalent of approximately 142 single-spaced typewritten pages.

When you want to store new information or retrieve previously stored information from a particular diskette, you insert the diskette into the diskette drive. Though each diskette has a limit to the amount of information it can hold, there is no limit to the number of diskettes you can create for use with your PC. Unlike the information in the computer's main memory, which "goes away" each time the computer is turned off, the information on diskette remains there until you modify or delete it. As a result, diskettes provide you with a means of permanently storing information.

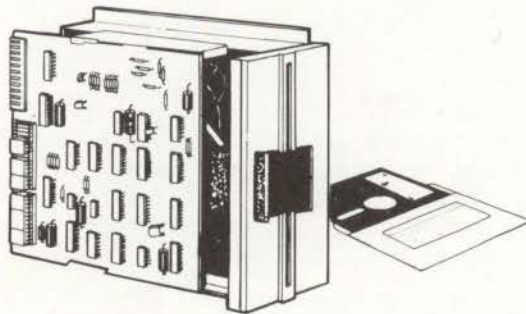


Figure 1-8. A Diskette Drive and Diskette

The Winchester Disk Drive: You have the option of having a Winchester disk drive installed in the electronics unit. The Winchester drive, shown in Figure 1-9, stores 10,000,000 bytes (10MB) on its 5 1/4-inch hard disk. This amount of storage represents more than 26 times the storage capacity of a single diskette. The Winchester disk stores the rough equivalent of 4,000 typewritten pages.

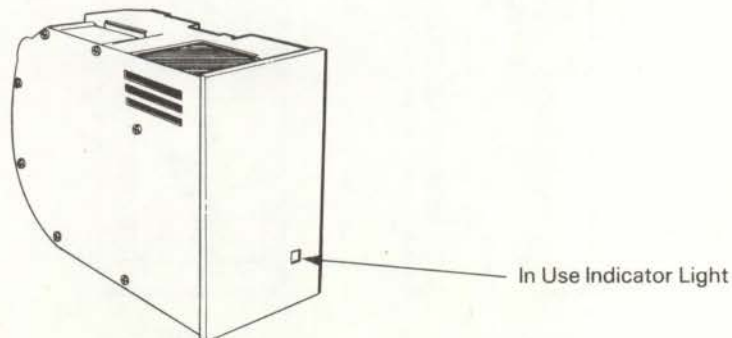


Figure 1-9. The Winchester Drive

The disk itself is sealed inside the Winchester drive. You do not replace or remove the Winchester disk from the drive at any time. If you fill up the 10MB of storage space on the Winchester disk, you can use various methods to create additional storage space. For example, if you copy a group of nonessential files from a full Winchester disk onto a diskette, you can then delete the nonessential files from the Winchester and free up some disk space.

Expansion Slots: The five expansion slots, located inside the electronics unit, accommodate the various option cards available on the Wang PC. (Refer to Figure 1-10.) The Wang PC is designed so that any card can fit into any expansion slot.

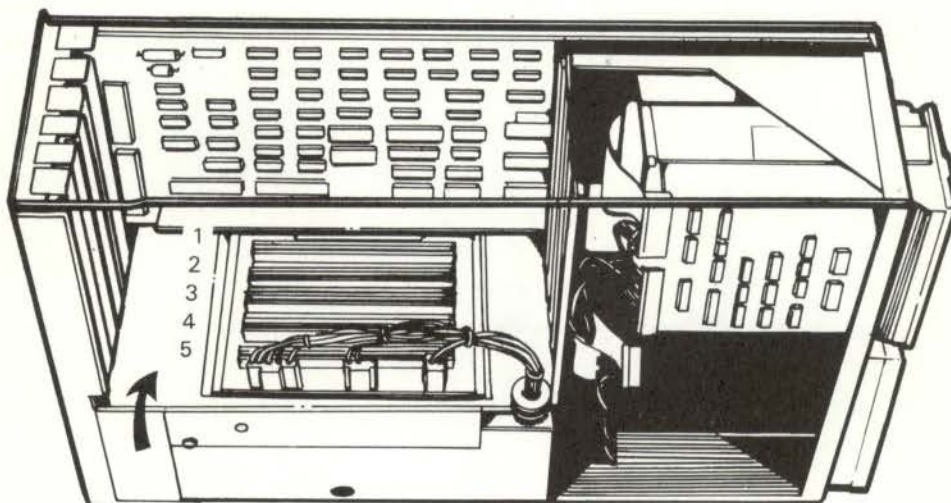


Figure 1-10. Expansion Slots

In addition to choosing a video card (which you must do if you purchased a Base Unit), you can add a variety of option cards to your system to increase its capabilities. Some of these option cards are:

- Memory Expansion card
- PC Remote Communications card
- PC Local Communications card
- PC CP/M-80 Emulation card
- Winchester Controller card

You can find complete descriptions of these options, along with installation instructions, in Chapter 9.

1.2.3 The Monitor

A monitor displays information. This information can be the information you type at the keyboard, or it can be the results that the computer displays after following a set of instructions contained in a piece of software. Most monitors contain a Cathode Ray Tube (CRT) -- a television-like vacuum tube with a luminescent screen.

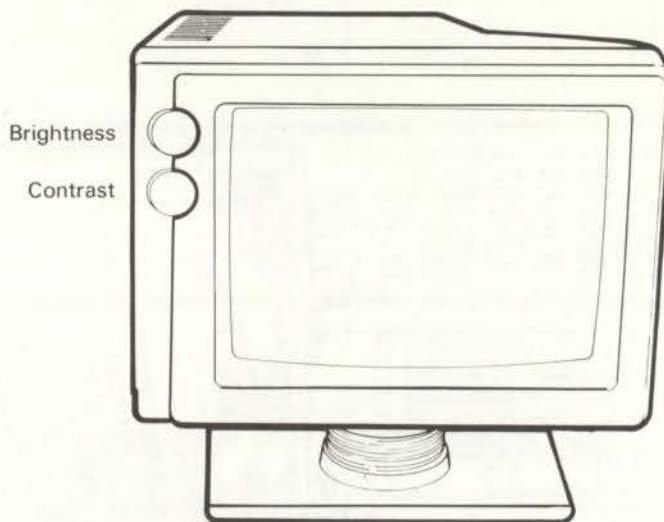


Figure 1-11. The Wang Monochrome Monitor

The Wang Monochrome Monitor displays green characters on a black background. It has a 12-inch screen, measured diagonally. The screen is coated with an anti-glare material that reduces eye fatigue. The monitor has a brightness knob and a contrast knob that allow you to adjust the appearance of the screen display. The standard monitor is on an adjustable pedestal base that lets you tilt the screen up or down. The Wang Monochrome Monitor is unique in that it can be attached to an optional arm which elevates it up to 14 inches off the desk surface, as illustrated in Figure 1-1. After you install the monitor on the arm, it is completely adjustable. You can tilt it forward or back and adjust it to face left or right. The arm is preset to swing in a 180-degree arc. However, you can set the arm to swing in only a 90-degree arc or in full circle.

You can use several different types of monitors with the Wang PC. Each monitor works in conjunction with a video card installed in one of the expansion slots within the electronics unit. A video card is a circuit board that allows a monitor to communicate with the System card. The following three types of video cards are available for the Wang PC.

Wang Monochrome Monitor Card: You must install this card in the electronics unit before you connect the Wang Monochrome Monitor to your system. The Wang Monochrome Monitor card displays characters on a screen in an area 80 columns wide and 25 rows deep. In preconfigured systems, the Wang Monochrome Monitor card is already installed within the electronics unit.

Wang Graphics Card: You can use this card in conjunction with the Wang Monochrome Monitor card to add graphics capabilities to your system. You cannot use this card without the Wang Monochrome Monitor card. The Graphics card allows you to create monochrome graphics made up of tiny dots. These dots, also called pixels, are the smallest unit that can be displayed on a screen. The degree of graphic resolution of any given screen is measured in terms of the number of dots that screen can hold. The higher the resolution, the finer the level of detail you can create using the particular graphics capabilities. When you use the Wang Graphics Card, you can create graphics with an 800 x 300 dot resolution.

Industry-standard Monitor/Graphics Card: If you install this card, you can connect an RGB color monitor or a black-and-white monitor to your system. If your color monitor is connected to the industry-standard Monitor/Graphics card, you can simultaneously display up to 16 colors on the screen. The combination of a monitor and the industry-standard Monitor/Graphics card produces a 640 x 225 dot resolution.

1.2.4 The System Diskettes

System Diskettes I and II contain the programs, or sets of instructions, necessary to start and run your system. The programs on the System Diskettes are those supplied with all versions of the system. System Diskette I includes the operating system and the system utilities. System Diskette II includes interpretive BASIC and the Wang PC text editor. Appendix K contains a list of all files on both System Diskettes.

1.3 PREVENTING PROBLEMS

Your Wang PC system combines innovative design concepts with a comprehensive support strategy to give you a systematic way to deal with problems. You can use a wide range of self-help facilities when you have a problem, from the HELP key on the keyboard to the System Diagnostics diskette. The self-help facilities are designed to enable you, as much as possible, to discover the cause of a problem and solve it yourself.

If your system develops a problem that you can't solve, you can call the Wang Professional Computer Assistance Center for consultation. (Refer to Section 1.3.4.) The Assistance Center will attempt to determine the cause of your problem and tell you what to do next.

1.3.1 Menu-Driven System

In a menu-driven system, you select a program from a list of options, called a menu, that appears on the screen. The advantage of a menu-driven system is that you don't have to remember the names of the available functions or any complicated command syntax. To select a menu option, you use the space bar and the BACKSPACE key to move the acceptance block (■) next to the option you want to select. You then press the EXEC key to run your option. Figure 1-12 displays the Main System Menu.

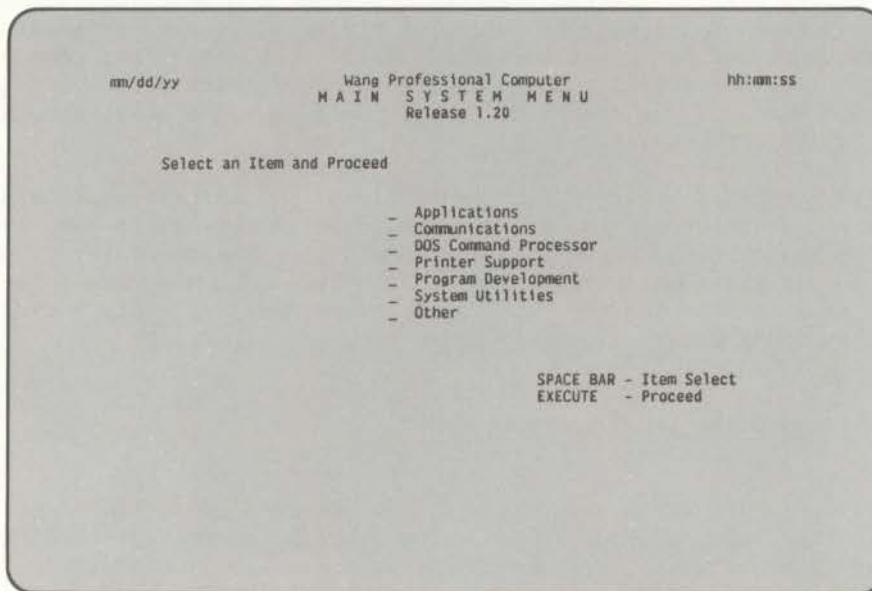


Figure 1-12. The Main System Menu

1.3.2 The HELP Key

You can receive assistance while using the Wang PC by pressing the HELP key. The type of information you receive depends upon the particular application you're using when you press HELP. For example, when you're in a PC Word Processing document, you can see a display of all of the Help screens available in PC Word Processing by simultaneously pressing SHIFT and HELP. When you decide which function you want information about, press HELP again. The prompt "Which Help?" appears on the screen. When you press the key that corresponds to the function you want to view, instructions describing the use of that function appear on the screen. Figure 1-13 shows the location of the HELP key on the keyboard, along with a sample Help display.

Use the SEARCH Key to:

1. Locate every occurrence of a specified character string from the beginning of a document or the current cursor position to the end of a document.
 - To search from the current cursor position press SRCH;
OR
From the beginning of the document, press SHIFT + SRCH.
 - At the prompt, enter the string of character that you want to find.
 - As the cursor stops at each occurrence of the string, perform any of the edit functions on it or press SRCH to find the next occurrence.
 - Each time you stop to edit an occurrence of the string, you must press SRCH and re-enter the string to find the next occurrence.

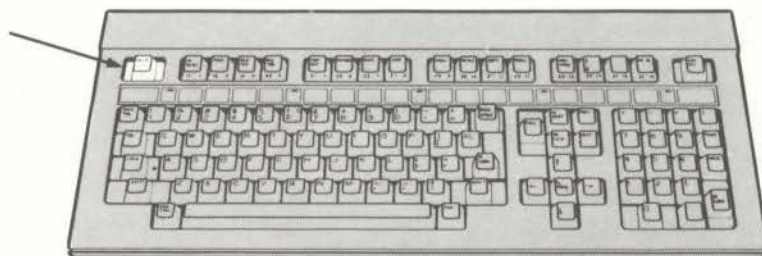


Figure 1-13. The HELP Key and Sample Display

1.3.3 The Manuals

Wang provides The Wang Professional Computer Documentation Guide as a comprehensive reference to the rest of the manuals in the set. You can turn to this book when you need to know which one of the manuals covers the topic you're interested in. The Documentation Guide includes a brief description of each manual, a general index, and a glossary. The Documentation Guide is the fastest way to find out where the information you need is located.

Each additional piece of software you buy, whether it's a language like COBOL or an application like PC Word Processing, has its own manual. Many software applications, including PC Word Processing and PC Multiplan, come with both a training and a reference manual.

1.3.4 Levels of Product Support (USA Only)

Wang has developed a comprehensive support plan to help you understand how to use the capabilities of your Professional Computer. Support services include everything from the toll-free telephone line to the Professional Computer Assistance Center to the range of service contracts you can purchase to protect your investment. The following paragraphs describe each of these services in detail.

Installation: You can arrange for a Wang Customer Engineer to install your system on a fixed-fee basis. The charge for this service applies regardless of any maintenance agreement you have purchased.

The Warranty: Under the terms of the 90-day warranty, you are entitled to service any time within the first 90 days after the date of delivery. Warranty repairs will be made when you mail the malfunctioning component to one of the three Wang Field Service Centers, located in Lawrence, MA, Atlanta, GA, and Marina Del Ray, CA. Before you can initiate a repair under the provisions of the warranty, your power-on diagnostic tests must indicate a defective device. You should then call the Wang Professional Computer Assistance Center at 1-800-343-1098 (617-459-5000 in Massachusetts, Alaska, and Hawaii) and give the diagnostic test results to the technical support personnel there. If the Assistance Center determines that you have a failed component, you will be asked to mail that component to the closest Field Service Center. This procedure covers any problems with the electronics unit, the keyboard, the Wang Monochrome Monitor, either of the Wang-supplied printers, and any other Wang-supplied system option or Wang-supplied diskettes.

If you have purchased the Special First Year Maintenance Contract, a Wang Customer Engineer will service your system at your place of business in the event that you encounter a problem after you unpack, connect, and install your equipment. There is no 90-day mail-in service during the warranty period under the terms of this contract.

If you do not have a First Year Maintenance Contract and your system develops a problem after the 90-day warranty period expires, you can either purchase a service plan or pay on a fixed-fee basis for any additional repairs.

The Wang Professional Computer Assistance Center: The Wang PC Assistance Center, located in Lowell, Massachusetts, supports a toll-free phone line from 8:30 am to 5:30 pm, Monday through Friday, Eastern time. By calling 1-800-343-1098 from anywhere in the United States, Puerto Rico, or the Virgin Islands (in Massachusetts, Alaska and Hawaii, call 617-459-5000 and ask to be connected to the Professional Computer Assistance Center), you can receive answers to questions about any Wang-provided application, utility, language, or operating system.

The Assistance Center can help solve any problems that develop while you are unpacking, assembling, connecting, or using your system. Of course, before you call the Assistance Center, you should try to solve the problem yourself using the various self-help resources available with your system. However, if your power-on diagnostics tests indicate a problem, call the Assistance Center for an evaluation of the tests. This evaluation will determine if a repair is necessary and what you should do if it is. The recommended procedure for using the services of the Assistance Center is outlined at the beginning of Appendix B, System Diagnostics.

On-site Maintenance Contracts: If you wish to have Wang service your PC at your place of business, there are two alternatives for on-site maintenance.

If you have purchased Wang's Standard Maintenance Contract, a Wang Customer Engineer can make repairs at your office for a one-year period starting after the 90-day warranty period expires. This is a one-year, renewable agreement that includes in its price all parts, labor, and preventive maintenance on your Professional Computer.

If you purchased the Special First Year Maintenance Contract, a Wang Customer Engineer can make repairs at your place of business as soon as you complete the unpacking, connecting, and installation of your system. In all other respects this one-year renewable contract has the same conditions and features as the Standard Maintenance Contract.

Mail-in Maintenance Contract: Under the Mail-in Maintenance Contract, you must first report the results of the power-on diagnostics tests to the Assistance Center for evaluation. The Assistance Center then instructs you to mail the component to one of the three domestic Wang Field Service Centers. Upon receipt of the component, the Service Center either repairs or replaces the defective component and mails it back to you.

Wang repairs or replaces the component without charge if the Service Center determines that the component was defective in workmanship or material at the time of shipment. Of course, all replaced components become the property of Wang.

Wang repairs the component at your expense if the Service Center determines that the component was damaged because of improper installation, improper use, or any other cause for which Wang is not responsible. In all cases, Wang shall be the sole judge as to whether the component was damaged by improper use, or whether the equipment was defective at the time of delivery.

Mail-in Fixed-Fee: If equipment repairs are necessary after the 90-day warranty period expires and you have not purchased either maintenance contract, you can use the mail-in system described above for equipment repair on a per incident fixed-fee basis.

The Professional Computer Course: You can enroll in a detailed course to learn about the Wang PC. The course is conducted at the Wang Corporate Education Center in Burlington, Massachusetts. Contact the Corporate Education Center at 617-273-5280 for further details.

2

SETTING UP YOUR WANG PROFESSIONAL COMPUTER

Introduction
Unpacking the System
Final Unpacking Sequence
Connecting Your System
Base Unit Connection Procedure
Connecting the Keyboard
Connecting the Wang Monochrome Monitor
Turning on Your System
Positioning Your System
Installation Procedures for Optional Items

CHAPTER 2

SETTING UP YOUR WANG PROFESSIONAL COMPUTER

2.1 INTRODUCTION

This chapter tells you how to unpack and connect your Wang Professional Computer system. Sections 2.1 through 2.3 describe how to unpack and position your system. If you have already unpacked your system, you can proceed directly to Section 2.4. Sections 2.4 through 2.9 tell you how to connect the three basic components of the Wang PC (the monitor, keyboard, and electronics unit).

Figure 2-1 shows the boxes you must unpack before you can connect your Wang Professional Computer. These boxes are:

- The "open me first" box (shown open in Figure 2-1). The important elements contained in this box include
 - The Wang Professional Computer Software License Agreement
 - The Wang Professional Computer Registration Card
 - System Diskettes I and II
 - the System Diagnostics diskette
 - two blank diskettes
 - write-protect tabs for the diskettes
 - disk drive labels (A, B, and C)
 - six rubber feet for the electronics unit
 - a Wang Supplies Catalog
 - The Wang Professional Computer Documentation Guide
 - The Wang Professional Computer Introductory Guide
 - The Wang Professional Computer BASIC Language Guide
 - The Wang Professional Computer Utility Programs User Guide
- The keyboard box. This box contains the Wang PC keyboard; its 6-foot coiled cable is attached to the keyboard.
- The electronics unit box. This box contains the Wang PC electronics unit. The system's main power cord and the Wang Monochrome Monitor cable are also packaged in this box. (You receive this cable even if you did not purchase the Wang Monochrome Monitor.)
- The monitor box. This box contains your monitor. If you purchased the Wang Monochrome Monitor, you have the box shown in Figure 2-1. Otherwise, you have a different monitor box.

If you did not receive a particular part, call your local Wang representative. Do not unpack any other boxes until you unpack and test the keyboard, the electronics unit, and the monitor.

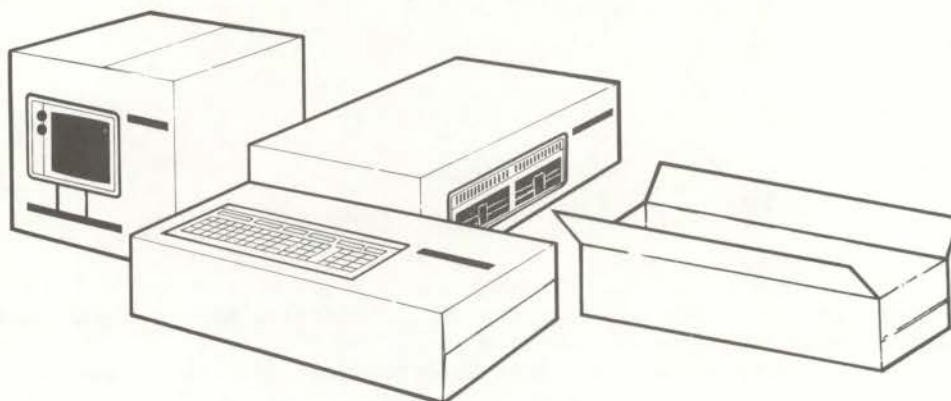


Figure 2-1. The Wang Professional Computer Fully Packaged

2.2 UNPACKING THE SYSTEM

Use the following steps to unpack your equipment so it will be correctly positioned for making the connections described later in this chapter:

STEP 1: Remove the keyboard from its box. Position it on your desk as shown in Figure 2-2.

STEP 2: Position the electronics unit box on its side, as shown in Figure 2-1. Slide the electronics unit out of the box.

STEP 3: Peel the adhesive backing off the rubber feet (found in the "open me first" box). Attach the rubber feet to the bottom or the left side (the side adjacent to the Wang logo) of the electronics unit, depending on the way you want to position the unit.

STEP 4: Position the electronics unit on your desk so that the back panel (the side with the fan and the red power switch) is facing you, as shown in Figure 2-2.

STEP 5: Take the envelope containing the power cord and the monitor cable out of the box. Remove the power cord and the monitor cable and place them on the desk.

STEP 6: Take your Wang Monochrome Monitor out of its box. Position it on your desk as shown in Figure 2-2.

NOTE:

If you are using a monitor other than the Wang Monochrome Monitor with your system, position it as instructed and then install the industry-standard Monitor/Graphics card. (Refer to Section 9.2.)

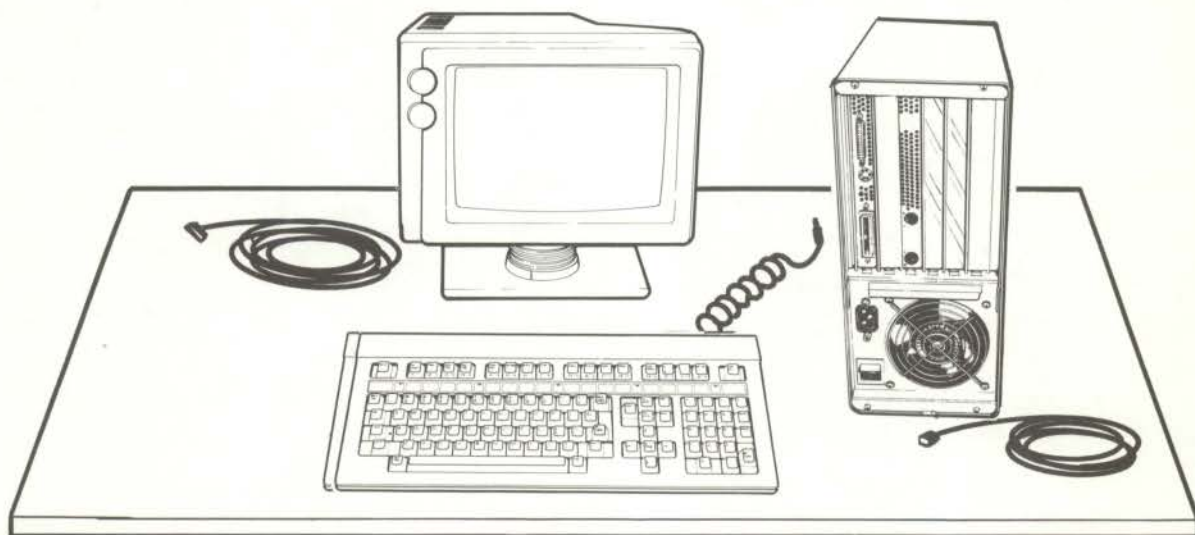


Figure 2-2. The Wang PC Unpacked

2.3 FINAL UNPACKING SEQUENCE

Perform the following steps to finish unpacking your PC. After you have finished unpacking, you will be ready to connect your system.

STEP 1: Remove the diskette drive shipping protector. To properly remove it from each diskette drive, do the following:

- A) Put one finger under the diskette drive door and pull it open. You will find a piece of cardboard inside the diskette drive. This is the shipping protector.
- B) Grasp the tab of the protector and pull it out of the drive as shown in Figure 2-3. Store the shipping protector with the other packing materials in the electronics unit box.
- C) If your Wang PC has two diskette drives, remove the shipping protector from the other drive.

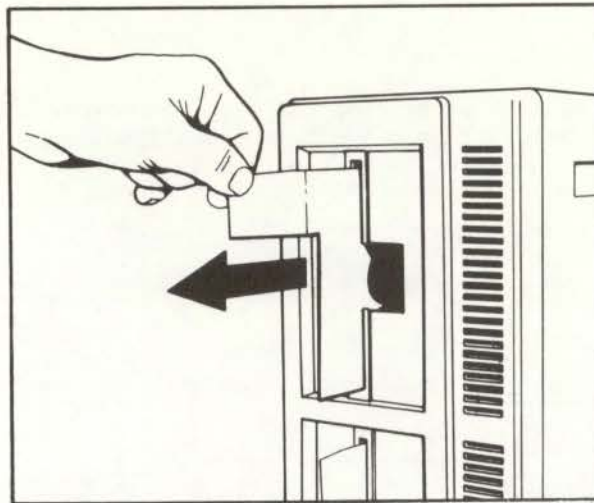


Figure 2-3. Removing the Shipping Protector From the Diskette Drive

STEP 2: Check the line voltage setting in your office. Your Wang PC has been preset at the factory for operation at 115 VAC.

CAUTION:

If you will be operating your Wang PC at a line voltage of 230 VAC, you must change the voltage setting. Appendix H tells you how to make this change.

STEP 3: If your PC has a voltage setting label covering the power switch on the rear of the electronics unit (as shown in Figure 2-4), you must remove it before you can use your PC.

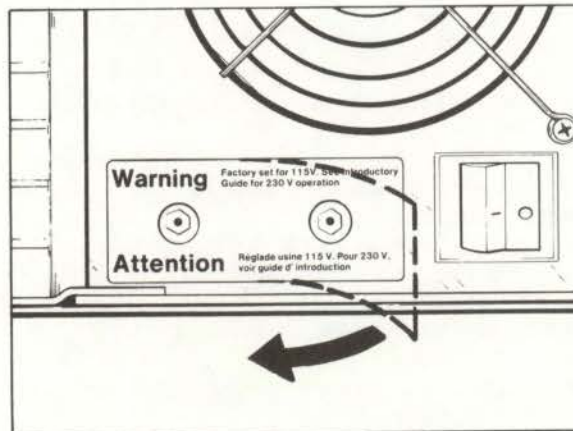


Figure 2-4. Removing the Voltage Setting Label

STEP 4: Find the disk drive labels in the "open me first" box and place them as illustrated in Figure 2-5.

NOTE:

If your system has a Winchester drive, label it Drive C.

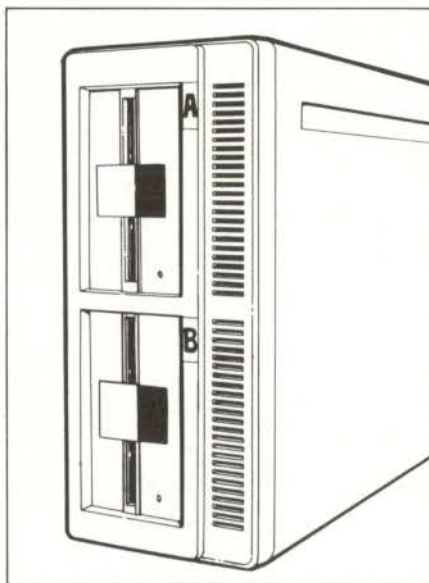


Figure 2-5. Labeling Your Diskette Drive(s)

2.4 CONNECTING YOUR SYSTEM

Your Wang Professional Computer system is easy to set up. The only tool you need to connect your system is a 1/4-inch flat blade screwdriver. There are three connections you have to make. You need to connect:

1. the keyboard to the electronics unit
2. the monitor to the electronics unit
3. the electronics unit to an AC power outlet

Before you begin to connect your system, check to be sure that the materials you've unpacked are positioned on your desk as illustrated in Figure 2-2. The back panel of the electronics unit should be facing you.

NOTE:

If your system does not look like the one shown in Figure 2-2, be sure to read Section 2.5, Base Unit Connection Procedure.

2.5 BASE UNIT CONNECTION PROCEDURE

If you purchased a Base Unit, you must install a video card in the electronics unit before you can connect your system. Chapter 9 tells you how to install your video card. If you are unsure whether or not you have a Base Unit, compare the back panel of your electronics unit with the one shown in Figure 2-6.

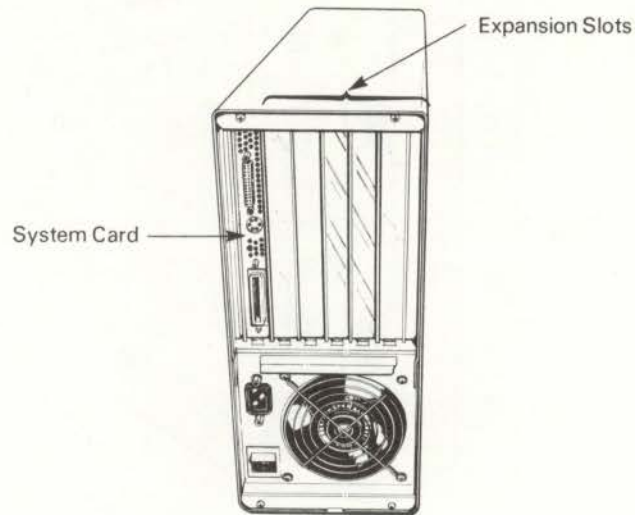


Figure 2-6. The Base Unit's Back Panel

Before you can use a monitor other than the Wang Monochrome Monitor with a Base Unit, you must install the industry-standard Monitor/Graphics card inside your electronics unit. Chapter 9 explains how to install this card. You must also connect your monitor to the connectors on the back of the Monitor/Graphics card. (Refer to Chapter 10.)

If you do not have a Base Unit, then you have a preconfigured system with a video card already installed in the electronics unit. You can confirm this by checking to see if one or more of the expansion slot panels on your electronics unit has a set of perforations and/or connectors as shown in Figure 2-2. These perforations and connectors indicate expansion slots where a card is already installed. If this is the case, you should continue to follow the directions in this chapter in order to connect your system.

2.6 CONNECTING THE KEYBOARD

Follow these steps to connect your keyboard to the electronics unit.

STEP 1: Find the keyboard connector on the back panel of your electronics unit. Figure 2-7 shows the location of the keyboard connector and the other important connectors.

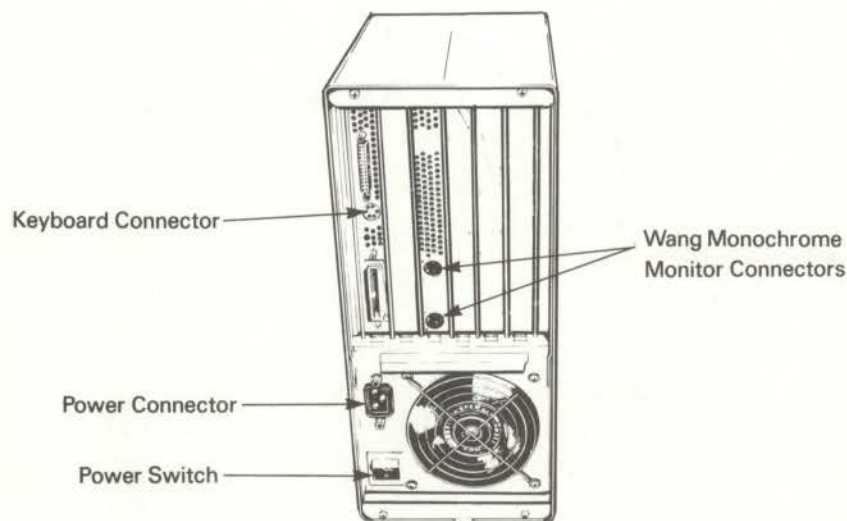


Figure 2-7. The Back Panel of a Preconfigured Unit

STEP 2: Connect the plug on the end of the keyboard cable to the keyboard connector located on the back panel, as shown in Figure 2-8. Align the pins in the plug with the holes in the keyboard connector.

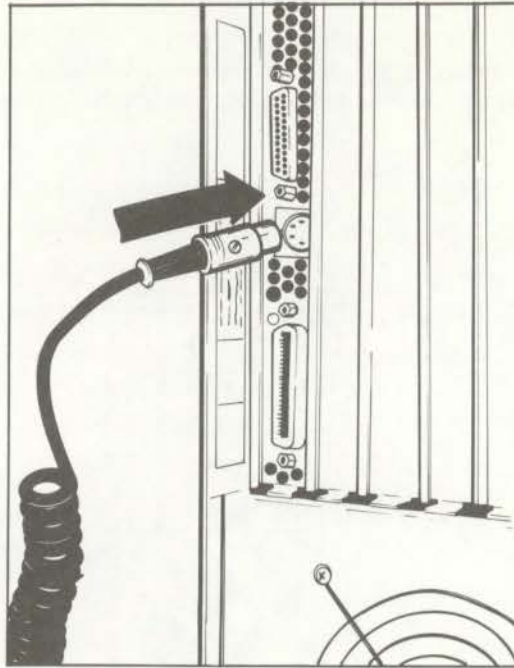


Figure 2-8. Connecting the Keyboard Cable

2.7 CONNECTING THE WANG MONOCHROME MONITOR

To connect the Wang Monochrome Monitor to the electronics unit, you must connect the monitor cable to the connectors on the underside of the monitor and to the connectors on the electronics unit. The ends of the cable are identical. Each end has one three-pin connector to carry power and one eight-pin connector to carry the video signals. You can attach either end of this cable to the electronics unit or the monitor. The Wang Monochrome Monitor card has two connectors on it, as shown in Figure 2-9. (This card may be located in an expansion slot other than the slot shown above.) The top connector is the eight-pin video connector, and the bottom connector is the three-pin power connector. To aid you in making these connections, the power cable and its corresponding socket have been labelled with a plus sign (+), and the video cable and its corresponding socket have been labelled with a triangle (▽).

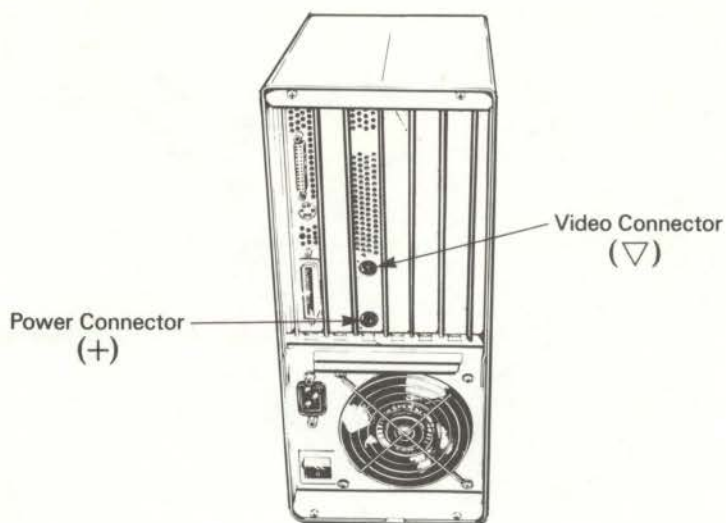


Figure 2-9. The Wang Monochrome Monitor Card Connectors

NOTE:

If your electronics unit does not have the two Wang Monochrome Monitor connectors on its back panel, you probably have a Base Unit. Section 2.5 explains what you should do next.

Use the following procedure to connect the Wang Monochrome Monitor.

STEP 1: Turn your monitor upside down, as shown in Figure 2-10. Note the position of the power and video connectors on the underside of the monitor.

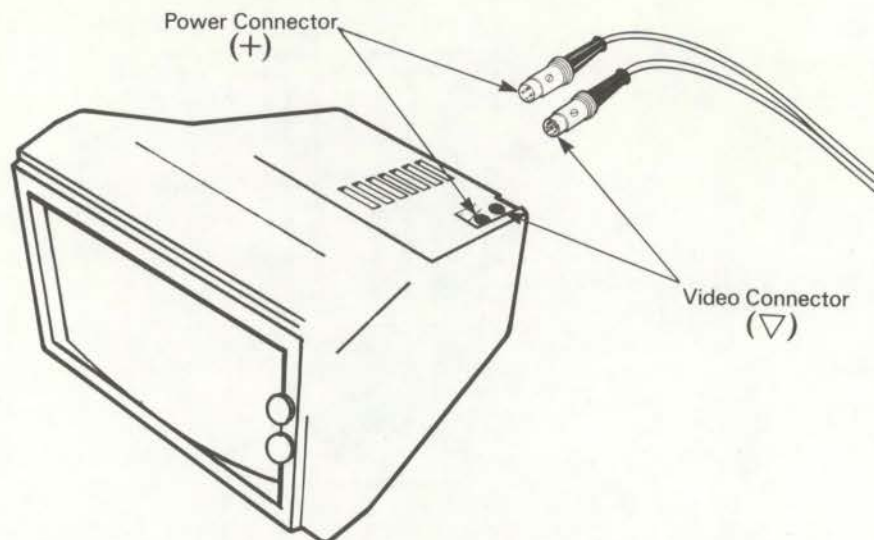


Figure 2-10. The Wang Monochrome Monitor Connections

STEP 2: Pick up either end of the monitor cable. Align the pins in the eight-pin video connector with the eight-pin socket on the underside of the monitor, as shown in Figure 2-10. Push the cable connector into the socket. If you have trouble making this connection, turn the connector slowly on the socket until the pins drop into place.

STEP 3: Use the same procedure described above to connect the three-pin power connector to the power socket on the monitor.

STEP 4: Take the free end of the monitor cable and attach the two remaining connectors to the sockets on the back panel of the electronics unit. Connect the eight-pin video connector to the top socket, as shown in Figure 2-11. Connect the three-pin power connector to the bottom socket. Turn the monitor right side up on your desk with the screen facing you.

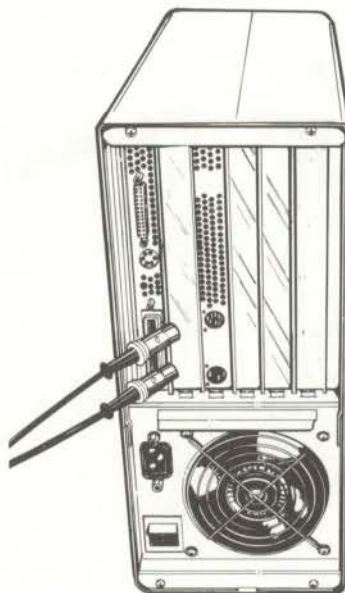


Figure 2-11. Completing the Wang Monochrome Monitor Connections

Your Wang Monochrome Monitor and keyboard are now connected to the electronics unit. The power switch located on the electronics unit controls the power sent to all three of these system components. As a result, whenever you turn on the electronics unit, you also turn on the monitor and the keyboard.

2.8 TURNING ON YOUR SYSTEM

Follow this series of steps to connect the main power cord and turn on your system.

STEP 1: Locate the main power cord. It was packed in the box that contained the electronics unit.

STEP 2: Connect the power cord to the three-holed socket located on the back panel of the electronics unit. Figure 2-7 shows the exact location of the socket.

STEP 3: Secure the power cord to the back panel by screwing the two round-head screws into the posts on either side of the power cord connector. Refer to Figure 2-12.

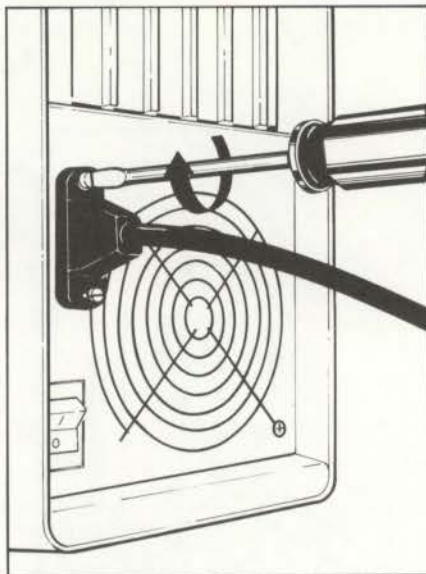


Figure 2-12. Securing the Power Cord

STEP 4: Turn off the red power switch. (The 0 should be flush with the back panel, as shown in Figure 2-12.)

STEP 5: Plug the free end of the power cord into an AC power outlet.

CAUTION:

Make sure that you have removed the shipping protector(s) from your diskette drive(s) before you turn on your system. Refer to Section\2.3 for instructions on how to remove the shipping protector.

STEP 6: Turn on the power switch. (The 1 should be flush with the back panel.)

Your computer system is now on. Each time you turn on the system, the computer runs its power-on diagnostic tests. While the tests are running, the five LEDs on the keyboard light up. If your system is operating correctly, all of the LEDs go off after approximately 15 seconds, and the message in Figure 2-13 appears on the screen:

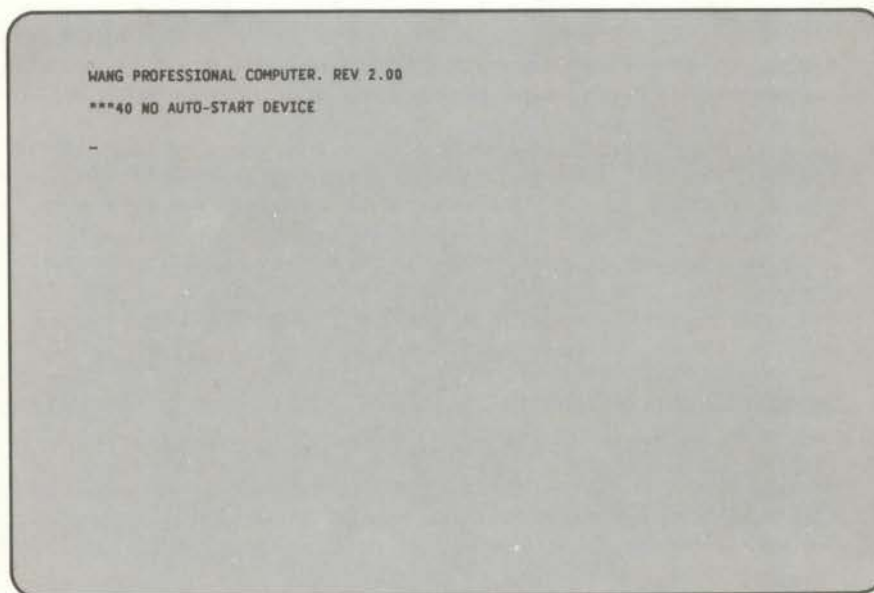


Figure 2-13. The Non-Start Display

This message appears if you try to start the system with Drive A's door open. If you try to start your system with Drive A closed but without loading System Diskette I, the screen may display the following message.

```
***41 START FAILED
    72 DRIVE A NOT READY
```

These messages do not indicate that there is a problem with your system; they merely indicate that you did not insert System Diskette I in Drive A before you tried to start the system.

NOTE:

If any of the LEDs remain on for longer than 30 seconds, or if any messages other than the two shown above appear on the screen, there is probably a problem with one of your components. You should turn to Appendix B, System Diagnostics, for instructions on what to do next.

2.9 POSITIONING YOUR SYSTEM

Before you begin to use your system, turn it off and take a few minutes to set it up on your desk. Consider the following guidelines as you position the system components in your work area:

- Position the electronics unit on your desk so the diskette drive is within an arm's length. You should be able to comfortably open and close the diskette drive doors from your normal working position.
- Allow enough space between the electronics unit and the wall so that the fan can cool the electrical components efficiently. Inadequate ventilation of the electronics unit can lead to system failure.
- Position the monitor to allow approximately 20 inches between yourself and the screen. Remember that you can adjust the degree of tilt of the Wang Monochrome Monitor by pushing the top of the monitor toward or away from you.
- Check to be sure that the keyboard cable reaches the positions where you want to use the keyboard.
- Do not place the electronics unit horizontally on the floor, especially on carpeting. In this position the fan can circulate a potentially dangerous amount of dust and dirt through the unit.

Figure 2-14 shows four possible ways to arrange the components of the Wang Professional Computer.

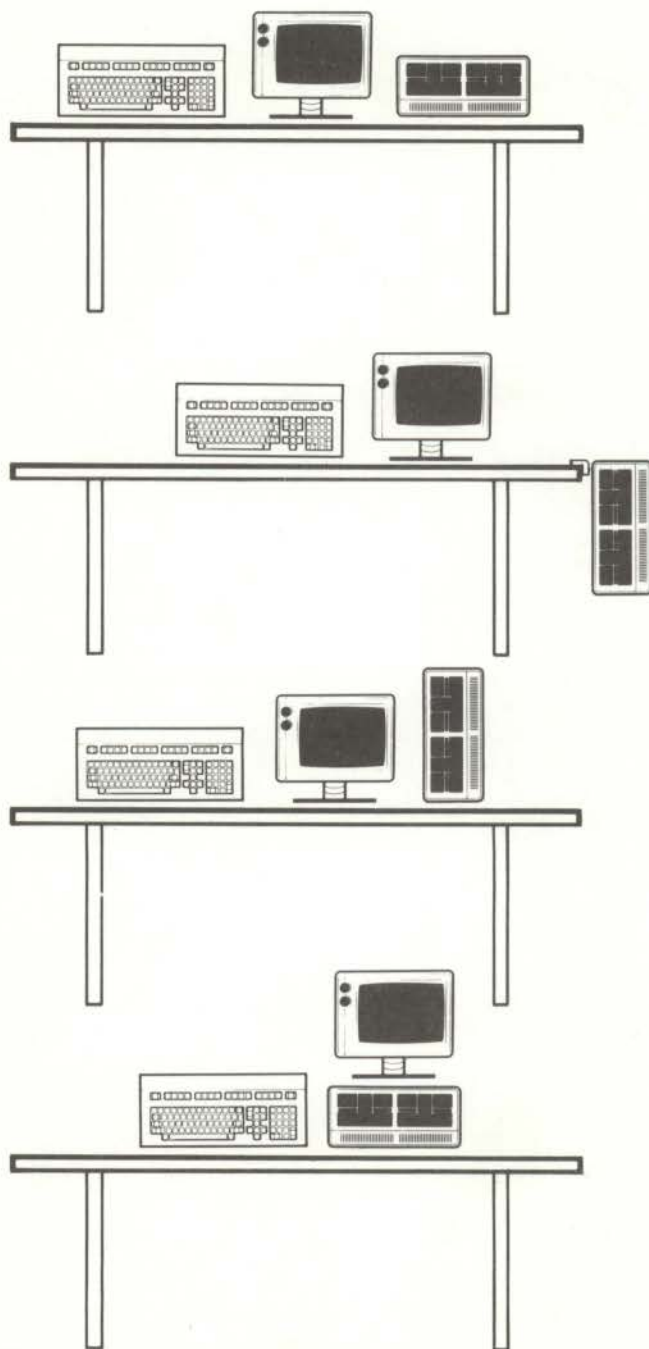


Figure 2-14. Suggested Wang PC Configurations

2.10 INSTALLATION PROCEDURES FOR OPTIONAL ITEMS

The preceding sections provide instructions for unpacking and connecting the basic components of the Wang PC (electronics unit, keyboard, and Wang Monochrome Monitor). The sections that provide procedures for unpacking and connecting your optional items are as follows:

- Winchester disk drive -- Section 9.3 tells you how to install the Winchester disk drive.
- Second diskette drive -- Section 9.4 provides instructions for installing a second diskette drive.
- Cards -- Section 9.2 provides installation procedures for option cards. If you plan to install a Winchester controller card, you should read Section 9.3.1 first.
- Monitor other than the Wang Monochrome Monitor -- Section 10.1 tells you how to connect a monitor other than the Wang Monochrome Monitor to your system.
- Monitor arm -- Section 10.2 gives instructions for assembling the monitor arm. Section 10.3 explains how to attach the assembled monitor arm to your desk.
- Printers -- Your printer manual contains unpacking and connecting procedures. In addition, you must also install a device driver before you can use a printer with your Wang PC. Appendix I tells you how to install a Wang PC device driver.
- Electronics unit desk clamp -- Section 9.5 explains how to install the electronics unit on the desk clamp.

3

GETTING ACQUAINTED WITH YOUR WANG PROFESSIONAL COMPUTER

Starting Your System
Finding Out What Files Are on a Diskette
Restarting Your System
Formatting a Diskette
Backing Up Your Diskettes
Loading an Application
Error Messages

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CHAPTER 3

GETTING ACQUAINTED WITH YOUR WANG PROFESSIONAL COMPUTER

Once you have unpacked, connected, and positioned your Wang PC, you are ready to begin working with it. The following sections provide procedures for several common tasks you can perform on your Wang PC that will help to familiarize you with your system.

3.1 STARTING YOUR SYSTEM

Before you start your system, make sure that the power switch on the electronics unit is turned off. (The 0 on the switch should be flush with the back panel.) Use the following series of steps to start your system:

STEP 1: Place one finger under the door to Drive A and pull it open.
(Refer to Figure 3-1.)

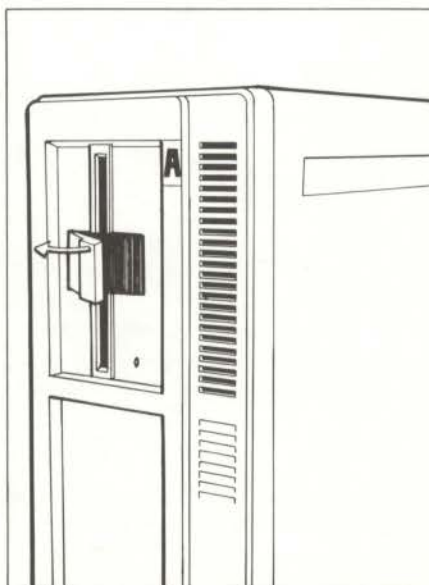


Figure 3-1. Opening the Door to Drive A

If there is still any packing material in your drive, remove it. (Refer to Section 2.3.)

STEP 2: Turn on the power switch.

STEP 3: Grasp System Diskette I (located in the same box in which you found this manual) as shown in Figure 3-2, and slip it into the slot in Drive A. Use the Insert and Up arrows on the label to confirm that the position of the diskette is correct as you insert it in the drive.

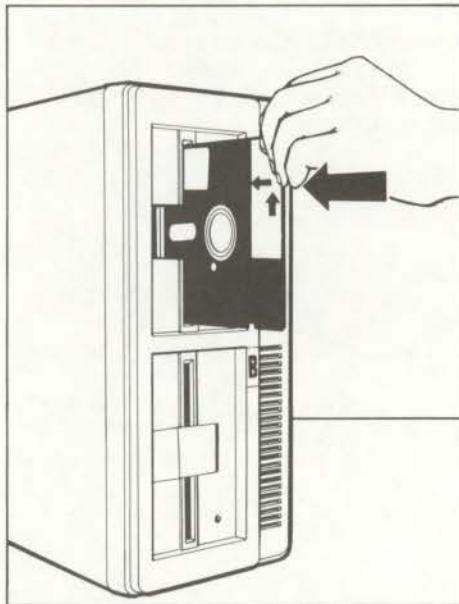


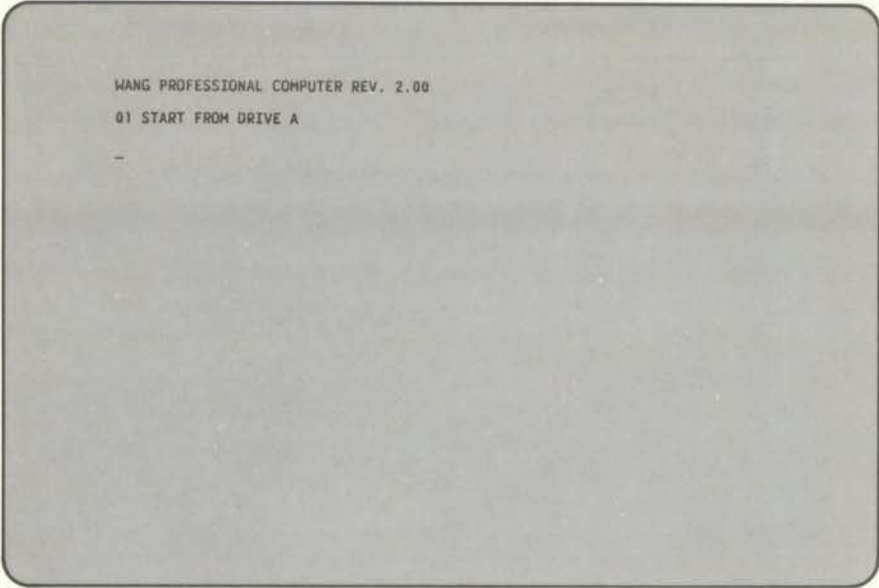
Figure 3-2. Inserting a Diskette

STEP 4: Close Drive A's door.

Nothing appears on the screen for the first 15 seconds after you turn on the switch. However, all five LEDs on the keyboard light up to signal that the power-on diagnostic tests are under way. After the diagnostics finish, all of the LEDs go out and the Start-up screen (refer to Figure 3-3) appears.

NOTE:

If any of your LEDs remain lit after about 25 seconds, you have a problem with your system. If this is the case, refer to Appendix B for instructions on how to use the System Diagnostics diskette.



```
WANG PROFESSIONAL COMPUTER REV. 2.00
01 START FROM DRIVE A
-
```

Figure 3-3. Sample Start-up Screen

NOTE:

If you have version 1.00 of the start PROM, the following messages appear on this screen:

```
WANG PROFESSIONAL COMPUTER. REV 1.00.
01 WILL START FROM DRIVE A
02 STARTING FROM DRIVE A
```

The Start-up screen appears automatically every time you start your system. The Start-up display indicates the status of your system. It also informs you if any system devices, such as diskette drives, are defective. If your system passes the power-on diagnostics, you should see a Start-up display similar to the one shown in Figure 3-3. The display indicates the device your system will start from.

NOTE:

Drive A is the start-up default drive. The system assumes that you will start from Drive A unless you change the default. Appendix G tells you how to change the start-up default drive.

Five seconds after the Start-up screen appears, the system displays the Date and Time screen shown in Figure 3-4.

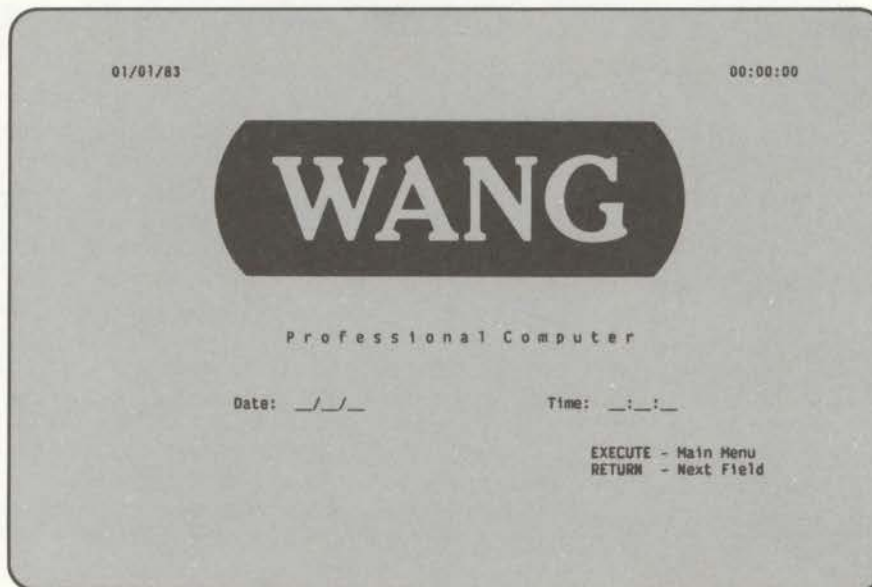


Figure 3-4. The Date and Time Display

When the display in Figure 3-4 appears, you have the option of entering the current date and time. If you choose to do this, simply type in the information; the system provides the correct format. You can get a further explanation of how to set the date and time by pressing the HELP key. When you are ready to continue, press EXEC to proceed to the Main System Menu shown in Figure 3-5. For a detailed explanation of the Main System Menu, read Chapter 7.

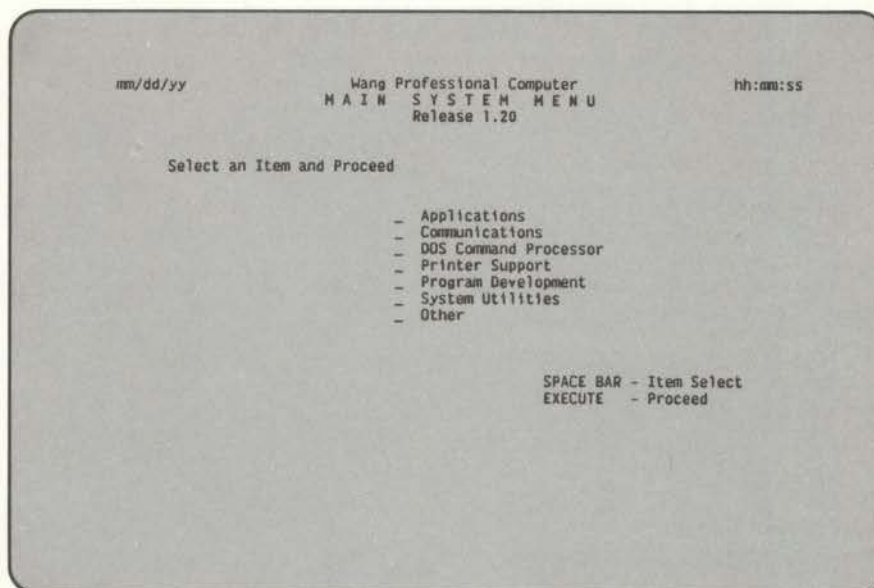


Figure 3-5. The Main System Menu Display

Remove System Diskette I from Drive A. Notice that the Main System Menu remains on the screen. That happens because when the system starts, it loads the menu program into main memory. When you remove the diskette, all of the programs loaded into memory remain there until you either delete them, turn off the power, or restart the system.

3.2 FINDING OUT WHAT FILES ARE ON A DISKETTE

Each Wang PC diskette contains a disk directory. A disk directory is a file that lists all the files on the diskette. The disk directory also records each file's size (in bytes), and the date and time when the file was last updated. This eliminates the need for you to maintain records of what files are on a particular diskette. To view the current directory of System Diskette I, follow these steps.

STEP 1: Start your system by following the procedures in Section 3.1 if you have not already done so.

STEP 2: When the Main System Menu appears, press the space bar to position the acceptance block next to the System Utilities option. Press EXEC. The System Utilities Menu appears on the screen.

STEP 3: Use the space bar to position the acceptance block next to the DIRECTORY DISPLAY utility, as shown in Figure 3-6. Press EXEC.

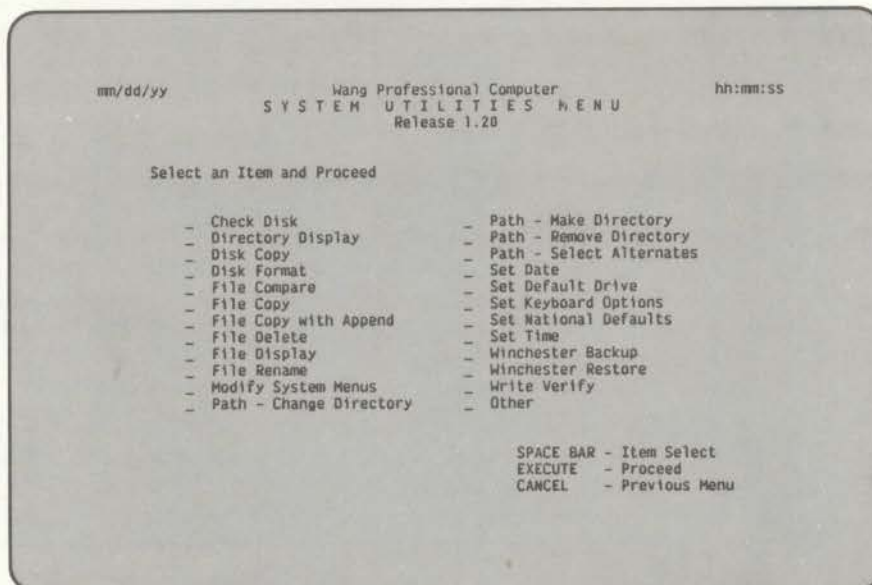


Figure 3-6. System Utilities Menu

STEP 4: When the display shown in Figure 3-7 appears on your screen, press EXEC again. The current disk directory of System Diskette I appears on the screen.

```

                        SYSTEM UTILITIES - DIRECTORY DISPLAY

Default Pathname: A:/

File:
  Drive: A              Volume ID: _____
  File ID: _____
  Page Display? (Yes/No) Y
  File Names Only? (Yes/No) N

                                EXECUTE - Proceed
                                CANCEL  - Return to Menu
                                RETURN  - Go to Next Field
  
```

Figure 3-7. DIRECTORY DISPLAY Utility Screen

For a more detailed explanation of how to use the DIRECTORY DISPLAY utility, refer to The Wang Professional Computer Utility Programs User Guide.

3.3 RESTARTING YOUR SYSTEM

When the system will not let you proceed with your work (for example, you try to execute a program and nothing happens), you need to restart your system. To do this, make sure that System Diskette I is in the start-up default drive, as explained in Section 3.1. Then, perform one of the following procedures:

- Turn the power switch in back of the electronics unit off, wait five seconds, and turn it on again. This procedure is known as a "cold start."

- Press 2ND and COMMAND simultaneously, and then press CANCEL. (Refer to Chapter 6 if you cannot find these keys.) This restart procedure is known as a "warm start." Figure 3-8 demonstrates how to use the warm start key sequence.

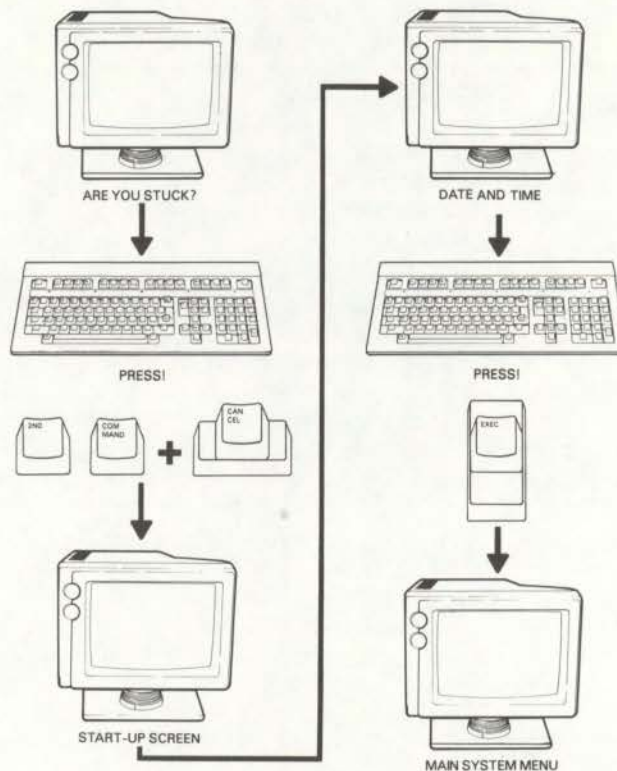


Figure 3-8. Warm Start Key Sequence

When you restart your system, you should use the warm start instead of the cold start if possible. A warm start takes you directly to the Start-up display shown in Figure 3-3. After a cold start, the system must run its power-on diagnostic tests before the Start-up display appears. For this reason, a warm start is about 15 seconds faster than a cold start. However, there are times when the warm start will not work; for example, if you have tried to start your system with a diskette that does not contain the system files and the message: *****41 START FAILED** appears. If the warm start does not work, you must restart your system using the cold start technique.

After you restart your system, you must reload the files you were working with before you can continue with your work.

3.4 FORMATTING A DISKETTE

A blank diskette is not like a blank cassette tape. You cannot put a new one in a diskette drive and write information onto it. If you try to, the system displays the message: ***41 START FAILED. You must format a diskette before you can use it. The formatting process organizes the diskette so that it can accept information by establishing how much information the diskette can hold, determining where it will be stored, and setting up the disk directory described in Section 3.2. Use the following steps to format a diskette.

NOTE:

If you format a full or partially full diskette instead of a blank one, the formatting procedure erases any files already on that diskette before it begins to format.

STEP 1: Start your system if you have not already done so. (Refer to Section 3.1.)

STEP 2: Position the acceptance block on the Main System Menu next to the System Utilities option. Press EXEC. The System Utilities menu shown in Figure 3-6 appears on the screen.

STEP 3: Position the acceptance block next to the DISK FORMAT option. Insert System Diskette II in Drive B. Press EXEC. The following display appears:

```

SYSTEM UTILITIES - DISK FORMAT

Drive: A

Define Disk Storage Capacity

_ 360 KB   _ 320 KB   _ 180 KB   _ 160 KB   _ Winchester

EXECUTE - Proceed
CANCEL  - Return to Menu
RETURN  - Go to next field

```

Figure 3-9. The DISK FORMAT Utility Screen

STEP 4: Enter an A or a B next to the Drive prompt to indicate the drive in which you want to format your disk. Press RETURN.

STEP 5: Press EXEC. A message similar to the following appears on the screen: "Insert new diskette for Drive A: and strike any key when ready." Insert the diskette you want to format into the designated drive. Press any key on the keyboard to start the formatting process.

STEP 6: When the system finishes formatting, it displays another message on the screen: "Volume label (11 characters, RETURN for none)?" You now have the option of specifying a volume label (up to 11 alphanumeric characters) to identify the diskette. If you want to specify a label, enter it following the prompt and press RETURN. If you do not want to specify a label, you need only press RETURN. Refer to The Wang Professional Computer Utility Programs User Guide for an explanation of volume labels.

STEP 7: The system displays a message specifying the total number of bytes on the disk and the number of bytes available. The system then displays the prompt: "Format another (Y/N)?" If you want to format another diskette, enter a Y to repeat this process. If you do not want to format another diskette, enter an N. The system then emits a beep and requests you to press any key on the keyboard to return to the System Utilities menu. Refer to The Wang Professional Computer Utility Programs User Guide for further information on the DISK FORMAT utility.

3.5 BACKING UP YOUR DISKETTES

Since information on a diskette can be inadvertently damaged or destroyed, it's important to develop the habit of making backup copies of all your diskettes. This backup procedure is easy to perform. It involves copying all of the files on one diskette onto a blank diskette. The process also formats your blank diskette as it copies the files onto it. Use the following steps to guide you through the process of copying System Diskette I onto a backup diskette.

STEP 1: Position the acceptance block next to the DISK COPY option on the System Utilities Menu. Insert System Diskette II in Drive B. Press EXEC. The DISK COPY utility display in Figure 3-10 appears on the screen.

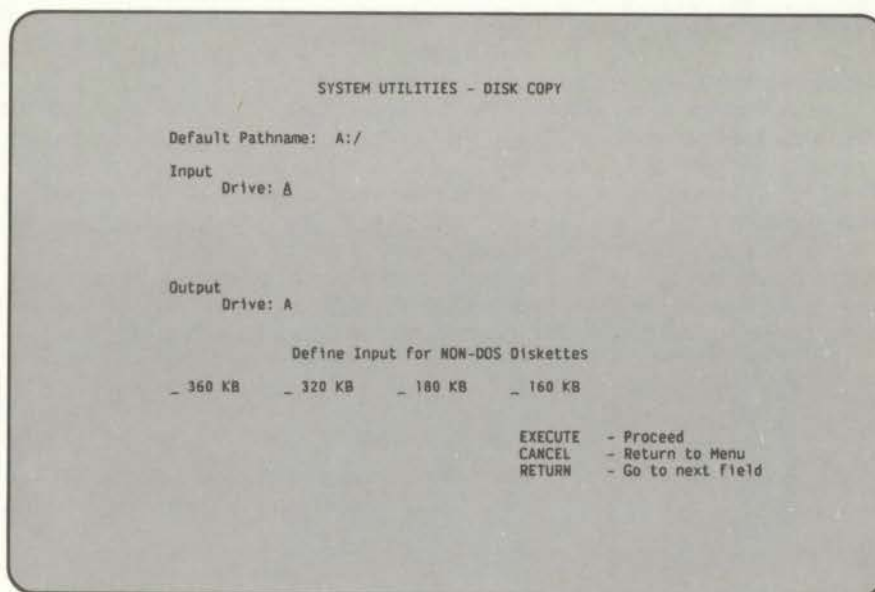


Figure 3-10. The DISK COPY Utility Screen

STEP 2: Press RETURN to position the cursor next to the Output Drive prompt. Enter the letter A next to this prompt. Press EXEC. The following message appears on the screen:

```
Diskcopy version 1.00
Insert source diskette in Drive B:
Insert object diskette in Drive A:
Press any key to continue.
```

STEP 3: Insert the blank diskette in Drive A. Press any key on the keyboard.

STEP 4: When the system finishes the copying process, the prompt: "Copy another diskette (Y/N)?" appears on the screen. If you wish to repeat this procedure, enter a Y; otherwise, enter an N. If you enter an N, the system displays the message: "Insert SYSTEM disk in Drive A: Press any key to continue."

STEP 5: Make sure that System Diskette I is in Drive A. Press any key on the keyboard. The system then emits a beep and prompts you again to press any key on the keyboard to return to the System Utilities Menu.

3.6 LOADING AN APPLICATION

Applications such as Multiplan and Word Processing are not on either of the System Diskettes, but on diskettes of their own. To load an application, use the following procedure.

STEP 1: Start your system as described in Section 3.1, if you have not already done so.

STEP 2: When the Main System Menu shown in Figure 3-5 appears on the screen, use the space bar and BACKSPACE key to position the acceptance block next to the Applications option. Press EXEC. The Applications Menu appears.

STEP 3: Remove System Diskette I from the drive it is now in. Replace it with your application diskette.

STEP 4: Position the acceptance block on the Applications Menu next to your application. Press EXEC. Your application should now be running.

NOTE:

If your application is not listed on the Applications Menu, check to see whether it's listed under another Main System Menu selection such as Communications or Program Development. If the application isn't listed on the menus, you need to use the MODIFY SYSTEM MENUS utility to put it on the appropriate menu. The MODIFY SYSTEM MENUS utility is described in The Wang Professional Computer Utility Programs User Guide.

To provide easier access to an application, you can make a copy of System Diskette I, delete any unnecessary files from your copy, and copy the application files to the modified System Diskette I. This eliminates the need for you to replace System Diskette I with your application diskette when you enter your application, and to replace your application diskette with System Diskette I when you exit your application. Appendix J provides step-by-step instructions for this procedure.

3.7 ERROR MESSAGES

It is easy to create situations that cause the system to display an error message on the screen. Appendix C lists all of the error messages and includes an explanation of each one. In addition, Appendix A, Common Problems, provides you with information that can help you find your way out of trouble. If all else fails, restart your system to see if you develop the same problem a second time. If not, you've probably made a syntax error. If you do develop the same problem, read over the section of the guide that explains what you're trying to do. Restart the system and try again. If you still encounter the same problem, record what happened on a sheet of paper and call the Wang Professional Computer Assistance Center at 1-800-343-1098.

4

COMPUTER CONCEPTS AND TERMINOLOGY

Introduction
Instructions and Programs
Main Memory and External Devices
Files
Measuring Storage Capacity
Records and Blocks
Disk Organization
Communicating with the Computer

CHAPTER 4

COMPUTER CONCEPTS AND TERMINOLOGY

4.1 INTRODUCTION

This chapter introduces some fundamental concepts of computer operation. You need to understand these concepts, and the terminology associated with them, in order to understand the discussions of computer operations in later chapters of this book. If you have had no previous introduction to computers, you should read this chapter. If you have had previous computer experience, you can proceed to Chapter 5.

4.2 INSTRUCTIONS AND PROGRAMS

There are many differences between computers and other machines. From the user's point of view, however, the most important difference is that a computer is a machine you control through the use of language. Unlike other machines, you control a computer by giving it instructions expressed in words and symbols. For example, "PRINT 2 + 2" is an instruction in the BASIC computer language telling the computer to add two and two and print the result.

A set of instructions grouped together for a specific purpose is called a program. The information in a program can also include data for the instructions to operate on, since the purpose of instructions is to process data. For example, a comptroller might use a computer program to calculate and print payroll checks. The payroll program could contain an instruction to multiply an employee's salary by a percentage to obtain the amount of a deduction. To execute this instruction, the computer must have the amount of the employee's salary and the percentage of the deduction. Both the instruction and the data could be contained in the program. (Usually, however, it is not efficient for a program to contain the data it works on. Refer to Section 4.4.1.)

In describing computer languages, computer literature often makes a distinction between two kinds of instructions: commands and statements. Commands instruct the computer to perform system operations, such as loading a data file. Statements tell the system to perform processing operations, such as calculating a mathematical equation. While this distinction is important in many contexts, the fundamental thing to remember is that both commands and statements are instructions belonging to some program.

4.2.1 The Operating System

Every action the computer performs originates from a program. Before you enter a program of your own, the computer is executing programs that belong to its operating system. The operating system is the underlying set of programs that control and support the running of other programs. For example, in order to use a payroll program, you have to instruct the computer to run that program. The instruction to run the payroll program belongs to a program that is part of the operating system.

4.2.2 Application Programs and Utility Programs

The programs that run from the operating system belong to one of two kinds: application programs and utility programs. Application programs are programs that perform a specific business or clerical function, such as calculating and printing payroll checks or creating a personnel file. Utility programs, on the other hand, support the use of the computer for business applications but usually do not have a direct business function of their own. For example, you can write your own programs or modify existing programs by using a utility program called the Editor. The immediate function of the Editor is not to solve business problems, but to facilitate the writing of other programs that do.

4.3 MAIN MEMORY AND EXTERNAL DEVICES

Executing an instruction involves the two elements essential to any computer: main memory and the Central Processing Unit (CPU). The CPU executes all instructions. In order for the CPU to do this, however, the instructions must reside in main memory, where the CPU can retrieve them. Main memory stores all programs for use by the CPU, as well as data that the program may work on. Main memory also contains a storage area called a buffer, which temporarily stores items such as program results. Figure 4-1 illustrates the relationship between the CPU and main memory.

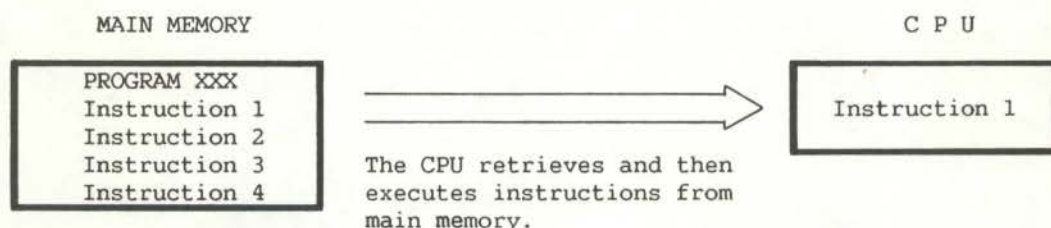


Figure 4-1. The CPU and Main Memory

Wang PC manuals often refer to main memory simply as memory. Other computer literature refers to it as internal memory, main storage, or internal storage.

The instructions and data stored in memory come to it from external devices such as the keyboard, a disk, or a communications device. When the computer has finished executing a program, it normally sends the results to an external device such as the monitor, a printer, a disk, or a communications device. Figure 4-2 illustrates the relationship between the computer and its external devices.

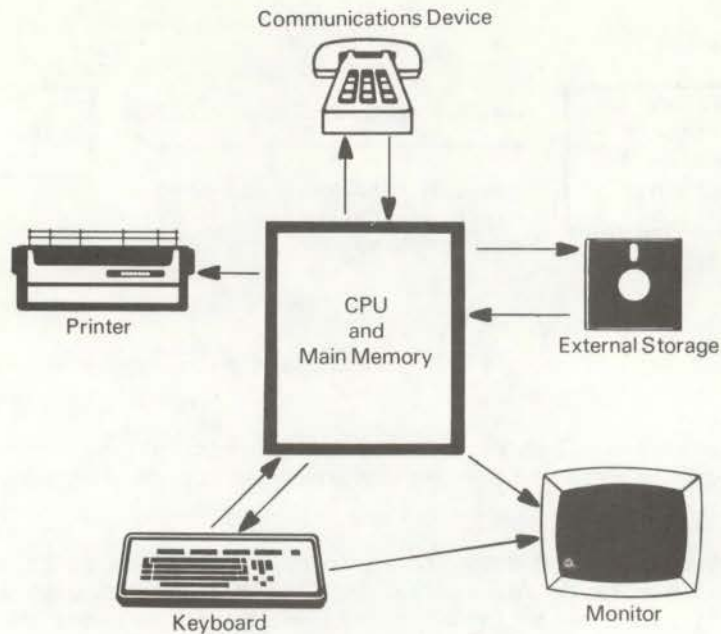


Figure 4-2. The Computer and External Devices

4.3.1 Input/Output

Input/Output (I/O) is a general term covering the transfer of information between memory and external devices. Bringing information from an external device into memory is called reading. Sending information from memory to an external device is called writing. Managing I/O is one of the most important functions of the operating system.

4.3.2 External Storage

In ordinary operation, a computer uses much more information than it is capable of retaining in main memory. Therefore, most information resides outside of memory on external devices such as magnetic tape or disks. Computer literature refers to storage of this type as auxiliary, secondary, or external memory or storage.

The Wang PC uses diskettes (described in Chapter 5) and the Winchester disk (described in Chapter 8) for its external disk storage. When the computer needs information that is not in memory, it searches for that information on the disk storage device and reads it into memory. Figure 4-3 illustrates the transfer of information between memory and external storage.

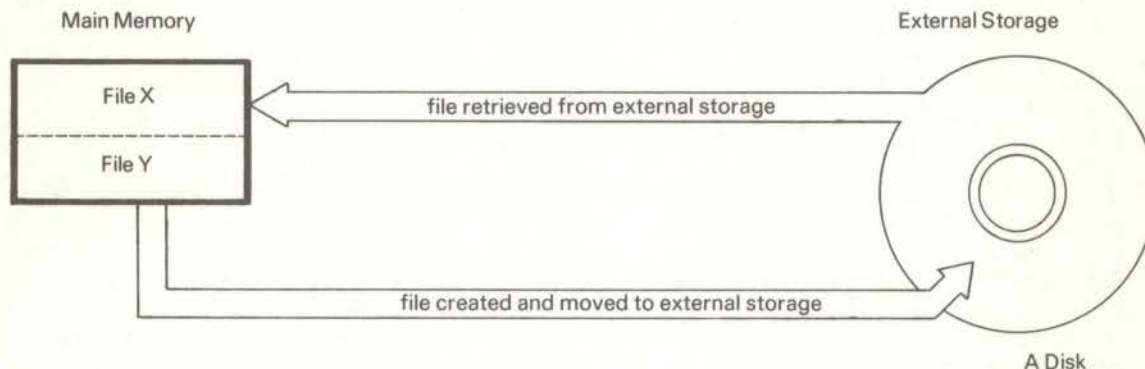


Figure 4-3. Memory and External Storage

4.4 FILES

In order for a computer to know where to look for information stored on disk, that information must be stored in organized, retrievable form. Specifically, the computer organizes information in external storage into units called files and retrieves it by reference to file names.

In the same way that you identify the information in an ordinary office file by giving the file a name, you create a computer file by associating information with a file name. The Wang Professional Computer Utility Program User Guide tells you how to create a file name. Certain programs that run on the Wang PC have their own rules for creating files. These rules are described in detail as part of the explanation of each program.

The computer finds the information in a particular file by keeping track of where that file is stored on disk. For example, you might have a payroll program in a file named PAYROLL. When you instruct the computer to execute this program, the computer looks up the location of PAYROLL on the disk, goes to that location, and reads the information it finds there into memory.

4.4.1 Types of Files

Files can contain programs or they can contain data for a program to operate on. Once created, program files are usually harder to modify than data files; the instructions in a program usually do not need to be changed as often as does data. Therefore, it is more convenient to keep the data in separate files. For instance, if a payroll program contained the names and salaries of employees, you would have to rewrite part of the program every time you added or deleted a name or made any change in a salary. Instead, you could keep salary data in a file named, for example, PAYDATA. The payroll program could then instruct the computer to read this data into memory at the appropriate time.

Another data file might contain a business letter you have written. From your point of view, this file may seem unlike PAYDATA in that it has a purpose other than providing data for a program to process. From the point of view of the computer, however, the business letter is data to be processed by a program, for instance, the program that sends the letter to a printer. As far as the computer is concerned, in other words, all information kept in files consists either of programs or of data to be processed by programs.

4.5 MEASURING STORAGE CAPACITY

Some of the system utilities display messages informing you that a file has so many bytes or that so many bytes are unused in memory or on a disk. Bytes are the units that measure the storage capacity of memory and disks. A byte is the amount of space used to store one alphabetic or symbolic character. For example, the symbol \$ and the letter A each take up one byte of storage. A numeric character can take up one or more bytes, depending on the character code the computer uses.

4.6 RECORDS AND BLOCKS

Data files usually contain more information than the computer needs at a particular time. Therefore, when the computer reads information from a disk or writes it to a disk, it usually does not deal with a whole file at once. Instead, the computer handles the contents of files in units known as records and blocks.

A record is a specific number of bytes. The number of bytes in a record can vary from file to file and even within the same file. When the computer transfers information to or from a file, it moves a group of consecutive records, called a block. The operating system specifies the size of a block. When it has moved a block of records into memory, the computer uses the information in the block on a record-by-record basis. Figure 4-4 illustrates the relationship of files, blocks, and records.

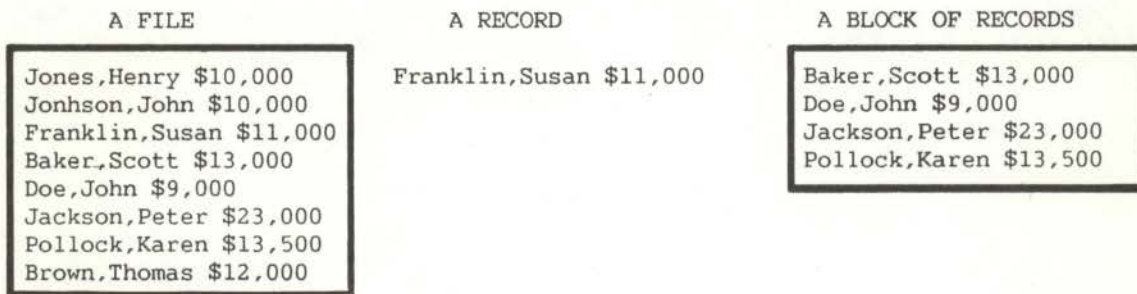


Figure 4-4. File, Block, and Record

4.7 DISK ORGANIZATION

Because you create, modify, and delete files from a disk at various times, the computer usually assigns the contents of a file to noncontiguous areas of a disk. When you create a file named PAYDATA, for instance, the file takes up only so much area on the disk. When you later create another file, say, TAXFILE, the computer may assign that file to the area that is contiguous to PAYDATA. If you then want to add information to the PAYDATA file, the computer must assign the additional information to an area that is not contiguous to PAYDATA's original location.

Since the information belonging to a file can be scattered throughout the disk, the computer must have a way of finding it. To record where the parts of a file are located, the Wang PC reserves areas on diskettes and on the Winchester disk known as directories and File Allocation Tables (FATs). Before you can understand how these function, you must first understand how information is physically handled on a disk.

A disk's storage area is laid out in concentric circles called tracks. The machinery in a disk drive accesses the tracks in units called sectors. That is, the computer does not read or write an entire track at one time but only a sector of that track. On the Wang PC, a sector is made up of 512 bytes.

The computer assigns space to files in groups of contiguous sectors called allocation units. For example, it may first allot eight allocation units to the file PAYDATA, then the next nine allocation units to TAXFILE, and then the next ten to the continuation of PAYDATA.

A directory contains, among other things, the names of files and the number of the sector containing a file's first record. The information in the File Allocation Table allows the computer to find the remaining sectors allotted to the file. (The Wang Professional Computer Program Development Guide explains directories and FATs in greater detail.) Figure 4-5 shows the layout of a directory and a File Allocation Table on a track of a disk.

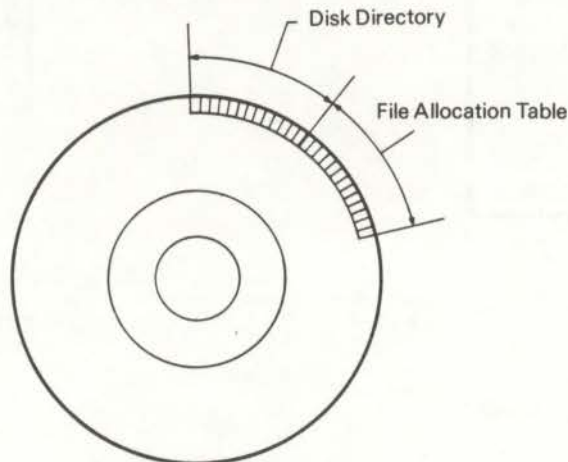


Figure 4-5. Disk Directory and File Allocation Table

4.8 COMMUNICATING WITH THE COMPUTER

There are two ways in which a computer executes instructions. Sometimes the computer executes a series of instructions stored in a file. This method of executing instructions is called batch processing. At other times, the computer executes instructions as you enter them from the keyboard. This method is called interactive processing.

Since almost all uses of the Wang PC involve interactive processing to some degree, the following sections explain interactive processing. For an explanation of batch processing, refer to The Wang Professional Computer Utility Programs User Guide.

4.8.1 Prompts

In interactive processing, you respond to prompts displayed on the screen. A prompt is simply a request for you to supply specific information that enables the computer to proceed to the next operation. Prompts can take the form of words or symbols. For example, when you power on your system, the third screen you see in normal operation includes the prompt:

Date _ _ / _ _ / _ _

Time _ _ : _ _ : _ _

You respond by typing in the date and time and pressing the EXEC key.

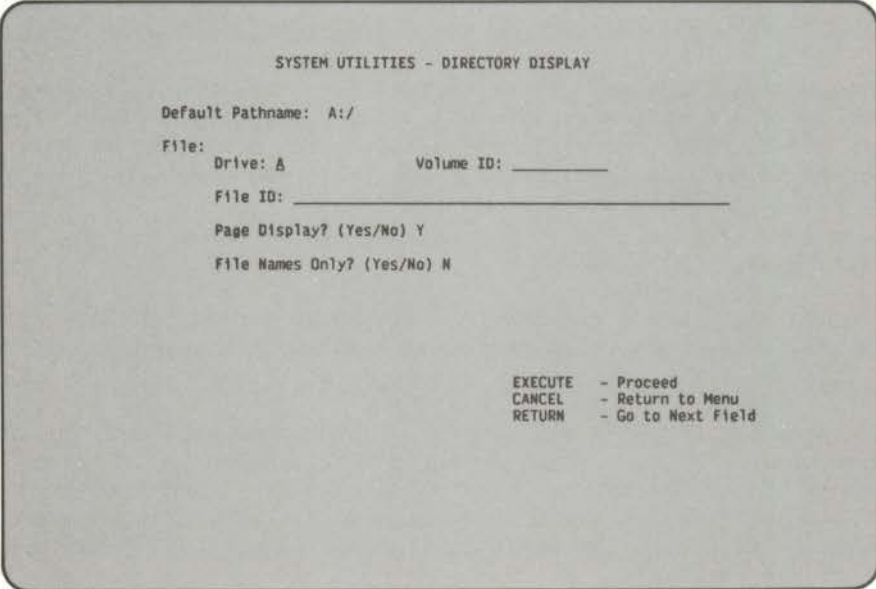
The prompt displayed by the interpretive BASIC program, on the other hand, is simply the letters Ok. This prompt tells you the computer is ready to accept instructions in BASIC. You respond by typing the instruction and pressing RETURN.

Notice that in the first example your response to the prompt is not complete until you press the EXEC key, and in the second example it is not complete until you press the RETURN key. These keys send your instruction to the computer. Before you press them, you can go back and change your response to the prompt. In any case, it is important to note that merely typing a response does not tell the computer to carry out that instruction.

The EXEC and RETURN keys often send instructions to the computer, but some programs may use other keys. In still other programs, just typing a response can be sufficient to give the computer a command. The manuals describing these programs list the procedures for responding to prompts.

4.8.2 The Cursor and Fields

In the following prompt from the DIRECTORY DISPLAY utility program, the EXEC key sends the instruction to the computer, but the RETURN key has a different purpose:



```

SYSTEM UTILITIES - DIRECTORY DISPLAY

Default Pathname: A:/

File:
  Drive: A           Volume ID: _____
  File ID: _____
  Page Display? (Yes/No) Y
  File Names Only? (Yes/No) N

EXECUTE - Proceed
CANCEL  - Return to Menu
RETURN  - Go to Next Field
```

Figure 4-6. DIRECTORY DISPLAY Utility Prompts

This prompt asks you to supply several items. The area on the screen where you enter your response is known as a field. The place where you begin typing is indicated on the screen by a blinking horizontal bar. This bar is called the cursor. When you enter a character in a field, the cursor moves to the next position within that field. When you have filled a field, the cursor remains in the last (rightmost) position in the field.

On the screen shown in Figure 4-6, you must press RETURN to move the cursor to the next field. If you do not press RETURN, you can change your entry before going on to the next field. The computer will not accept any entry you make on this screen until you press the EXEC key. To modify any entry in this prompt, return the cursor to the appropriate field by pressing RETURN a sufficient number of times. (When the cursor is at the last field, RETURN moves the cursor to the first field.) The keys used to move the cursor from one field to another may differ from program to program.

4.8.3 Parameters and Defaults

In response to a prompt, you must frequently type in a value for some variable. For example, in response to the time prompt you supply digits representing the hour, minute, and second. You might respond to the time prompt as follows:

11:15:00

A variable to which you assign a value is known as a parameter. Thus, in the time prompt, you supply values for the hour, minute, and second parameters.

When a prompt appears on the screen, a predetermined response frequently appears with it. A response that the computer supplies for you is known as a default. For example, the utility program called DIRECTORY DISPLAY displays the information in disk directories. The following question appears as part of the DIRECTORY DISPLAY utility prompt:

File Names Only? (Yes/No) N

If you do not want to see all the information in a directory but only the names of the files, you must enter Y in response to this question. However, the computer has already entered N as the default response.

The computer supplies defaults for your convenience and, sometimes, for your protection. In cases where a particular response is likely to be the most common, supplying that response by default saves you the step of typing it in. In other cases, a particular response can have destructive consequences. Supplying the least destructive response by default protects you against the accidental occurrence of such consequences, since it requires you to deliberately change the response in order to achieve them.

For example, you can use a utility program called FILE DELETE to delete a group of files from a disk. It is possible to accidentally include in the group a file you do not wish to delete. To protect against this, the computer displays the following prompt before executing the command.

Are you sure? (Y/N)N

By making N the default, the computer reduces the risk of accidental deletion by requiring you to change the response in order to execute the command.

4.8.4 The Default Drive

The default drive is the drive the computer automatically uses for I/O operations. It is also the drive from which the system starts. For example, if you select an item from the Main System Menu, the computer looks for that item on the diskette in the default drive. If the computer cannot find the item, it returns a message asking you to insert the proper diskette in the drive.

There are times when you may want to change the default drive (for example, if you want to access a menu that is on a diskette in another drive). You can change the default drive in several ways. The CHECK DISK and MODIFY SYSTEM MENUS system utilities and the Other option on the Main System Menu allow you to temporarily change the default drive. When the change is only temporary, the computer uses another drive as the default while a particular program is running, but restores the original default drive when it returns to the place from which it invoked that program.

You can change the default drive permanently by using the SET DEFAULT DRIVE system utility. You can also select the DOS Command Processor from the Main System Menu and use the method described in The Wang Professional Computer Utility Programs User Guide. When the change is permanent, the computer uses the new drive as the default drive until you restart the system or until you make another permanent change.

4.8.5 Menus

Often the Wang PC prompts display a series of options in horizontal or vertical lists. These lists are called menus. To instruct the computer, you select one or more options from the menu. The way you select these options differs with the design of each program. What you must do will be clear from directions given on the screen itself or from the manual that describes the program in which you are working. You can get additional assistance by using the HELP key in the upper left-hand corner of the keyboard (refer to Section 7.1.3). Figure 4-7, the Wang PC Main System Menu, is an example of a menu.

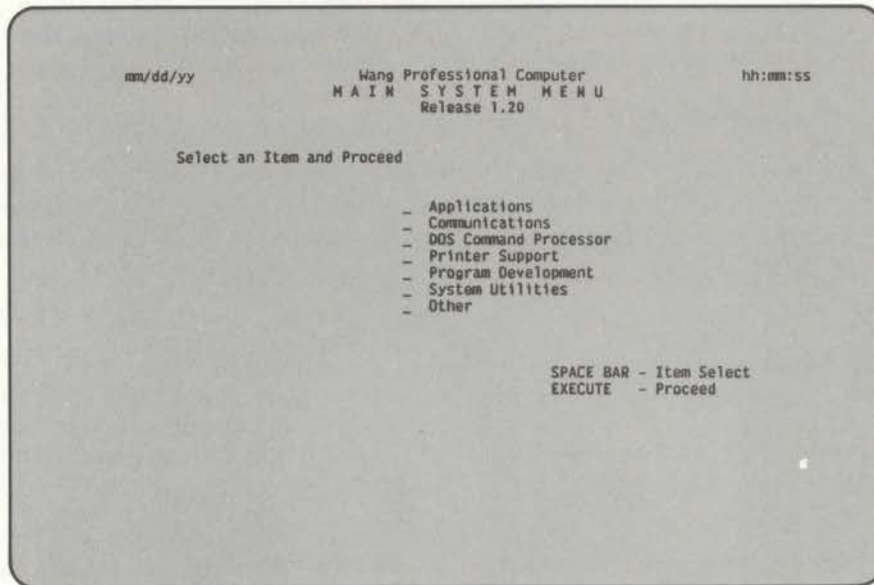


Figure 4-7. The Wang PC Main System Menu

The list in the middle of the screen contains the options available from this menu. You can select only one of these options at a time. The messages in the bottom right-hand corner of the screen tell you what keys to use in making your selection.

Immediately to the left of the first option is a solid, brightly lit block called an acceptance block. Before you can select an option, the acceptance block must be positioned next to it. The first message in the bottom right-hand corner ("SPACE BAR - Item Select") tells you to move the acceptance block from item to item by pressing the space bar. (When the acceptance block reaches the last item in the list, pressing the space bar moves it back to the first item.)

You can also move the acceptance block to an item on this menu by pressing the first letter of the item. If more than one item has the same first letter, pressing that letter would move the acceptance block to the next item beginning with the letter. When you reach the last item beginning with a letter, pressing the letter moves the acceptance block to the first item beginning with that letter.

Once the acceptance block is next to the option you want, press the EXEC key to enter your selection. Thus, the second message in the bottom right-hand corner reads:

EXECUTE - Proceed

In normal operation, the next screen that appears will belong to the option you have selected.

5

USING DISKETTES

What Is a Diskette?

Double-Sided Double-Density Diskettes

Parts of a Diskette

Taking Care of Your Diskettes

CHAPTER 5 USING DISKETTES

5.1 WHAT IS A DISKETTE?

A diskette is a thin magnetic disk that stores information. The information can include any combination of programs, files, or data. The information can be in various forms including applications software like PC Word Processing, languages like BASIC, operating systems like MS-DOS, or any other type of program you create, buy, or use. You can continually reuse or add to information that is stored on diskettes.

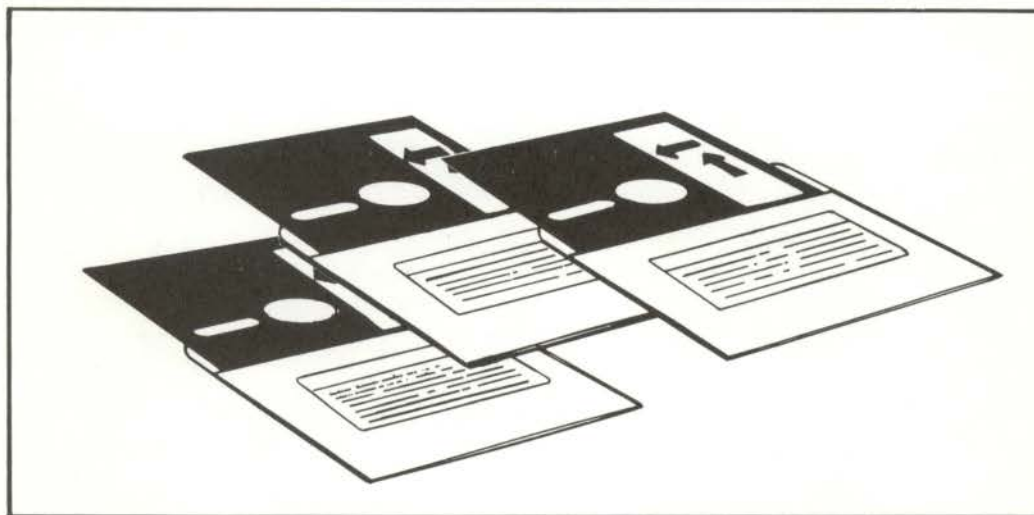


Figure 5-1. Wang PC Diskettes

When you want to put information on a diskette, a read/write head inside the diskette drive writes the information onto the diskette. When you want to run a program or retrieve some information from a diskette, a read/write head reads the information into the computer's memory. Figure 5-2 shows the inside of a diskette drive, including the location of a read/write head and the diskette recording slot.

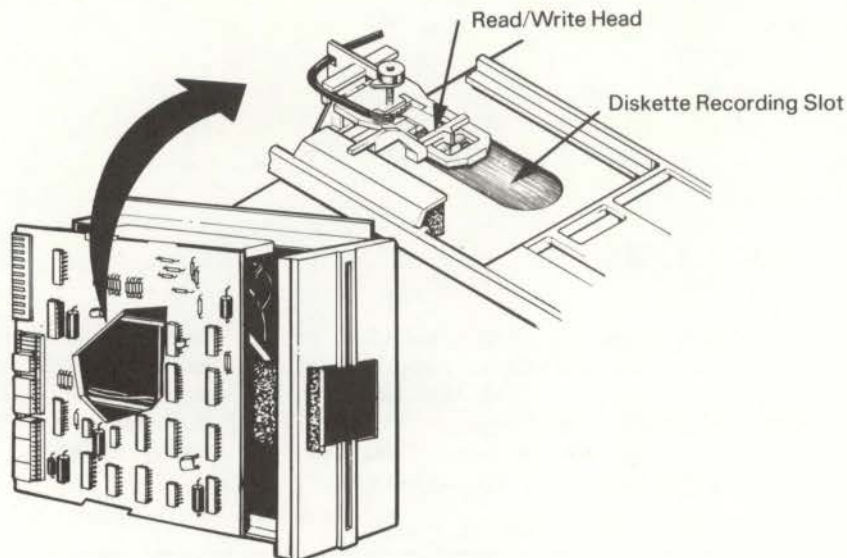


Figure 5-2. Inside of a Diskette Drive

5.2 DOUBLE-SIDED DOUBLE-DENSITY DISKETTES

Since each diskette drive in the Wang Professional Computer has two sets of read/write heads, you should use diskettes that store information on both sides of the diskette's magnetic surface. The amount of information that can be stored on a diskette depends on how tightly the information can be packed. Your Wang PC uses double-density diskettes; that is, diskettes that have twice as many places in which to put information as single-density diskettes. These diskettes are known as double-sided double-density (or DSDD) diskettes. Your Wang PC can also accept single-sided double-density (or SSDD) diskettes. SSDD diskettes store information on only one surface. Therefore an SSDD diskette can store only half as much information as a DSDD diskette of the same size. The Wang PC accepts and formats diskettes of 360KB, 320KB, 180KB, and 160KB storage capacity.

Each double-sided double-density diskette that you use in your system can hold a total of 360KB of information, which is the rough equivalent of 142 typewritten pages of information. Of course, the actual number of pages that you can store on diskette depends on the kind of information it is and the size of any other files that are necessary to maintain the diskette.

5.3 PARTS OF A DISKETTE

A diskette is actually a very simple storage medium composed of the parts shown in Figure 5-3.

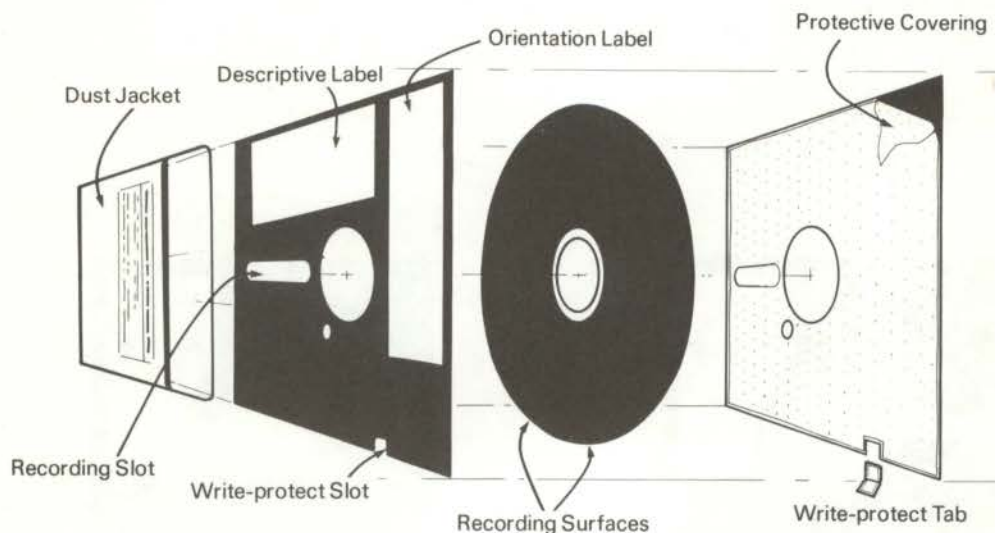


Figure 5-3. Parts of a Diskette

Protective Covering: The black plastic cover material protects the diskette's surfaces. The white undercoating, which is bonded to the black cover material, keeps the diskette surfaces clean and reduces friction. This undercoating also prevents dirt and dust from damaging the diskette.

Recording Surfaces: The magnetic surface of the diskette is the medium on which information is stored. Both sides of the diskette are used to store information on the Wang PC. You should not touch the part of the diskette that shows through the recording slot.

The Recording Slot: The recording slot is the area on the diskette that the read/write heads scan in order to read information from the diskette or write information to the diskette.

Write-Protect Slot: The write-protect slot provides you with a way of protecting information on a diskette. When you cover the write-protect slot with an adhesive tab, the diskette is write-protected. This means that the system can read all of the information on this diskette into memory, but the system cannot write additional information onto the diskette. You should write-protect any diskettes that contain valuable programs or data that you want to protect from accidental loss.

When the write-protect slot is uncovered, the diskette is not write-protected. This means that the system can read information from the diskette and write additional information to the diskette. You should make sure that the write-protect slot is uncovered before you attempt to store files on a diskette. Figure 5-4 shows the difference between a write-protected diskette and a diskette that is not write-protected.

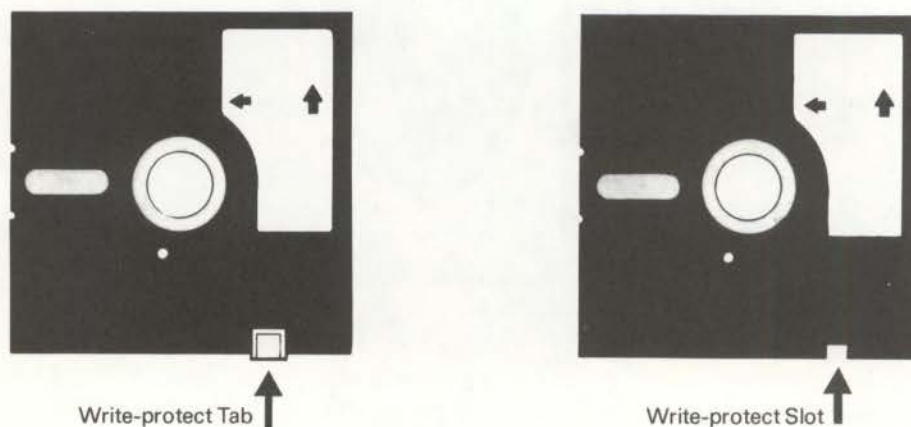


Figure 5-4. The Write-Protect Feature

NOTE:

Blank Wang PC diskettes are manufactured with the write-protect slot uncovered. These diskettes are not write-protected. You must cover the write-protect slot with one of the enclosed adhesive tabs to write-protect the diskette.

Orientation Label: This label indicates how you should position the diskette when you insert it into the diskette drive.

Descriptive Label: You should use this label to indicate the type of information on the diskette and the date it was created or last updated. Be sure to use a felt tip pen when you write information on a diskette label, as pencils and ball point pens can damage the diskette's surfaces.

Dust Jacket: When you're finished using a diskette, put it in its paper dust jacket to protect it from scratches.

5.4 TAKING CARE OF YOUR DISKETTES

Diskettes are a reliable and safe medium for storing electronic information. However, when diskettes are mistreated, information can be partially or totally lost. Since a full diskette could have the equivalent of over 142 typewritten pages stored on it, damaging one can represent a serious loss. This is especially true if you don't have a backup copy of an important diskette. Backup copies of diskettes are easy to create and update. Section 3.5 describes the procedure for backing up diskettes.

Use the following list of recommendations to take care of your diskettes properly:

1. Use a felt tip pen when you label a new diskette. Never use a ball point pen or pencil, as they can scratch the diskette's surfaces.
2. Do not touch the exposed magnetic surfaces of the diskette.
3. Keep your diskettes away from any type of magnetic material. Such exposure can erase or distort the information on a diskette.
4. Do not fold or bend diskettes or allow them to warp.
5. Store your diskettes in an environment with temperatures between 50° and 125°F (10° and 52°C) and a relative humidity between 8% and 80%. Conditions which exceed either of these limits can physically change the recording surfaces of the diskette so that information on them becomes irretrievable.
6. Do not open the door of a diskette drive if the red indicator light, located on the front of the drive, is on. You can scratch the surface of a diskette while it is being read from or written to by opening the door when the indicator light is on.

6

USING THE KEYBOARD

Introduction
Keyboard Functions
Combination Key Codes
The Typewriter Keys
Numeric Keypad
Cursor Control Keys
Special Operations Keys
Special Function Keys
Important Keys and Keyboard LEDs

CHAPTER 6

USING THE KEYBOARD

6.1 INTRODUCTION

The keyboard provides you with a way of interacting with your system. Whether you're making a selection on a menu, using an application, or developing a program, you use the keyboard to direct the operation of your system.

The system, in turn, uses the keyboard to communicate with you, either by sending a code through the set of five Light Emitting Diodes (LEDs) or by producing sounds through the speaker located within the keyboard housing. For example, during the power-on diagnostics, the LEDs indicate the start, finish, and results of the tests. Similarly, if you try to access an application without first inserting the corresponding diskette into the drive, the speaker emits a beep at the same time the "File Not Found" message appears on the screen.

Though similar in appearance to an ordinary typewriter keyboard, the Wang Professional Computer keyboard offers you many additional capabilities. You need to learn how to use these capabilities in order to take full advantage of the power of the system.

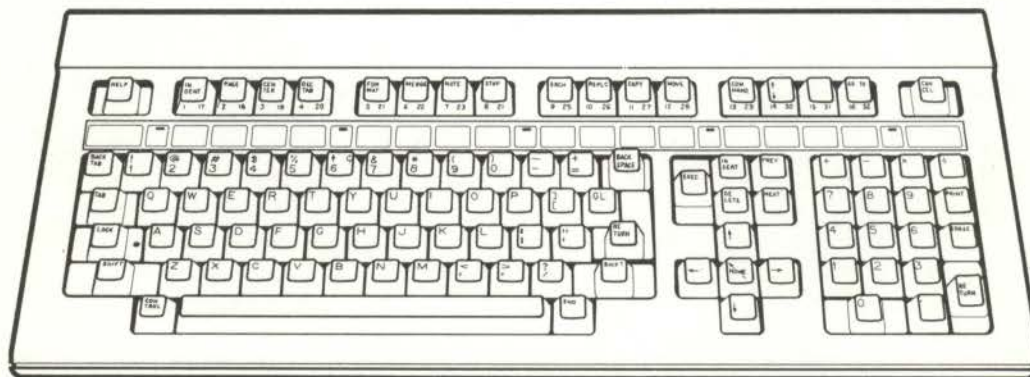


Figure 6-1. Wang Professional Computer Keyboard

6.2 KEYBOARD FUNCTIONS

This chapter presents a general description of how to use the keyboard. You should always check the appropriate reference manual before you begin to use an application, since different types of software use particular keys in specific ways. For example, in the Wang PC Word Processing software, the special function keys perform the functions as they are labelled on the keys. However, in the Multiplan software, the special function keys perform a completely different set of functions. When you load interpretive BASIC, you can use the special function keys to issue the set of BASIC commands that appear at the bottom of the BASIC screen display.

6.3 COMBINATION KEY CODES

Many keys, including the special function keys just discussed, can be used in combination with other keys to create additional functions. Keys gain this additional functionality when you press them along with SHIFT, CONTROL, or 2ND.

You use combination key codes in the same way you use SHIFT to create uppercase letters on a typewriter. First you press SHIFT, CONTROL, or 2ND, and then you press the combination key until the desired function occurs. The important concept involved in using these combination key codes is that you must hold down the first key while you press the second key.

When a combination key code is shown in this manual, it is shown in the correct keystroke sequence with a plus sign joining the two keys. For example, CONTROL + G is a control code that creates a beeping sound. To use this code, hold down CONTROL while you press the G key.

6.4 THE TYPEWRITER KEYS

The typewriter keys, shown in Figure 6-2, function the same as they do on a standard typewriter, with the following differences.

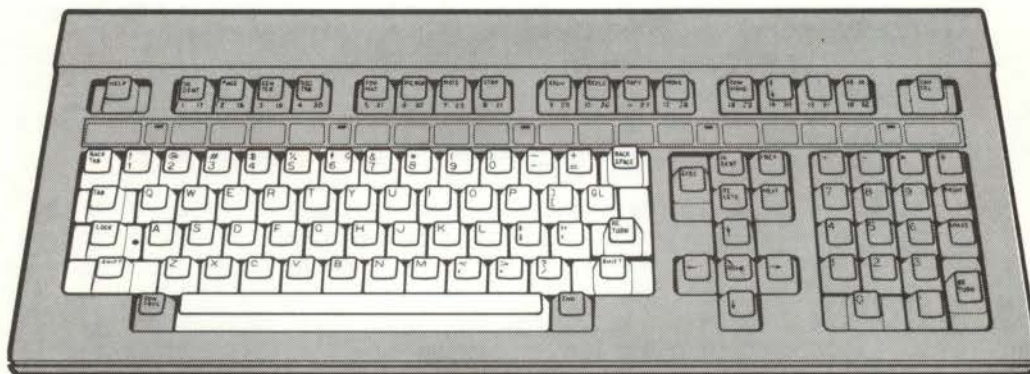


Figure 6-2. The Typewriter Key Group

Repeating keystrokes -- To make any character key within this key group repeat, just hold down the key for more than one-third of a second. There is no separate repeat key on the keyboard.

SHIFT -- Press SHIFT and then any character key (i.e., any letter, number, or symbol) within this key group to display the shifted character. As with a typewriter, a shifted letter key produces a capital letter. A shifted numeric or symbolic key produces the upper symbol on that particular key. When you release SHIFT, all subsequent characters will be lowercase.

NOTE:

Pressing SHIFT does not release LOCK. The LOCK key does not follow the same rules as the SHIFT key for producing shifted and unshifted characters. Be sure to read the LOCK description for more details.

You can also use SHIFT in combination with various other keys in particular applications to perform special functions. Each Wang Professional Computer reference manual describes the special uses of SHIFT within the corresponding software.

LOCK -- Press LOCK when you want letters to be capitalized and numeric and symbolic characters to remain unshifted. This feature makes it easy to type a group of numbers and uppercase letters without continually shifting up and down. If you need to type a shifted symbol while LOCK is engaged, press SHIFT and the appropriate key. (When LOCK is engaged and you press SHIFT and any alphabetic key, the letter appears as lowercase on the screen.) When you press LOCK, the red indicator light on the key lights up. LOCK is only released when you press it again. Once you do this, the indicator light will go out, showing that the keyboard is unshifted.

BACK SPACE -- Press BACK SPACE when you want to move backwards within text or within a menu. If you use the key to move backwards through text, you erase what's already written as you backspace through it.

space bar -- Pressing the space bar creates a space as you move forward through text. Characters ahead of the cursor position are erased as you press the space bar. If you want to move through text without erasing, use the cursor control keys.

If you press the space bar while using a menu, you will move the acceptance block to the next selection in the menu list.

RETURN -- The RETURN key is used in several ways. In a utility screen, you press RETURN when you want to move to the next field on the screen. You can then enter information in the field or modify the existing information, pressing RETURN again to move to the next field.

In BASIC, you press RETURN to signal the end of an instruction line or to input data.

In the Wang PC Word Processing software, RETURN is used within menus as described above. It is also used to indicate the end of a paragraph when you create a document. RETURN is not used in quite the same way as the carriage return key on a typewriter. You do not press RETURN at the end of each line, since the system automatically begins a new line when it reaches the end of the previous line.

NOTE:

RETURN on the numeric keypad functions the same as RETURN on the typewriter keypad. You can use these keys interchangeably.

GL -- The GL (Glossary) key is used in PC Word Processing to automate Word Processing functions for your particular needs. You can use the key to put frequently used information into your documents. Refer to The Wang Professional Computer Word Processing Reference Guide for a detailed discussion of the function of this key.

In BASIC, you can use the GL key in combination with an alphabetic key to input BASIC keywords. To do this, you first press the GL key, and then press the alphabetic key that corresponds to the keyword you want to enter. Refer to the Wang Professional Computer BASIC Language Guide for more information on entering BASIC keywords with the GL key.

BACK TAB -- Press BACK TAB to move the cursor to the previous tab setting on the display. (This key is used in Word Processing and in various menus.)

TAB -- Press TAB to move the cursor to the next tab setting on the display. (This key is used in Word Processing and in various menus.)

6.5 NUMERIC KEYPAD

The numeric keypad, shown in Figure 6-3, is included on the keyboard to make it easier to key in large amounts of numeric information. However, you cannot perform calculations with the numeric keypad unless you've loaded a type of software that supports arithmetic calculations, such as BASIC or Multiplan.

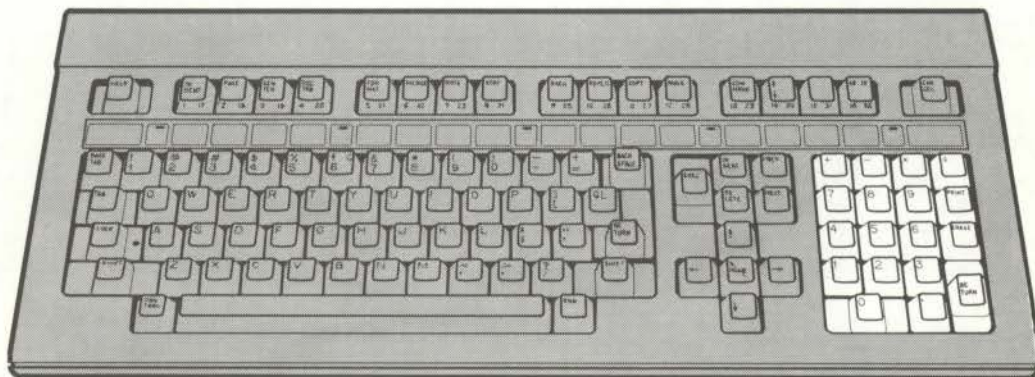


Figure 6-3. The Numeric Keypad

The functions of the keys on this keypad are described below.

PRINT -- Use PRINT to print information. Each Wang PC software reference manual explains how to print files.

ERASE -- Within certain applications you can press ERASE to delete everything from the present cursor position to the end of the field.

SHIFT + ERASE -- Within certain applications this combination erases an entire field regardless of the present cursor position.

RETURN -- RETURN performs the same functions as RETURN on the typewriter keypad. It is included on the numeric keypad to increase the speed of data entry.

X -- The multiplication symbol appears as an asterisk (*) within BASIC.

÷ -- The division symbol appears as a slash (/) within BASIC.

6.6 CURSOR CONTROL KEYS

The cursor is a horizontal blinking bar that shows you where the next character you type will appear on the screen. Moving the cursor around the screen with the cursor control keys does not erase any previously entered characters. However, if you move the cursor by pressing the space bar or BACK SPACE, you will erase each character as you go. You can repeat the cursor movement caused by pressing a cursor control key if you hold down the key for more than one-third of a second.

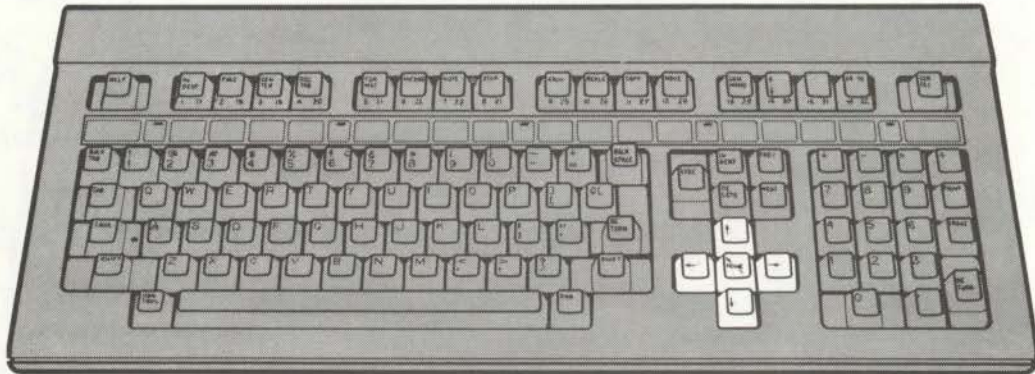


Figure 6-4. The Cursor Control Keys

The basic function of each key in this group is described below. Remember to use the reference manual for each application to learn the exact function of the cursor control keys in a particular situation.

RIGHT -- Moves the cursor one space to the right.

LEFT -- Moves the cursor one space to the left.

UP -- Moves the cursor up one line in its current column.

DOWN -- Moves the cursor down one line in its current column.

HOME -- Moves the cursor to the topmost left-hand position on the display (the first field on the display).

6.7 SPECIAL OPERATIONS KEYS

Each of these keys performs a specific operation within the Word Processing software, the BASIC editor, and in several other applications.

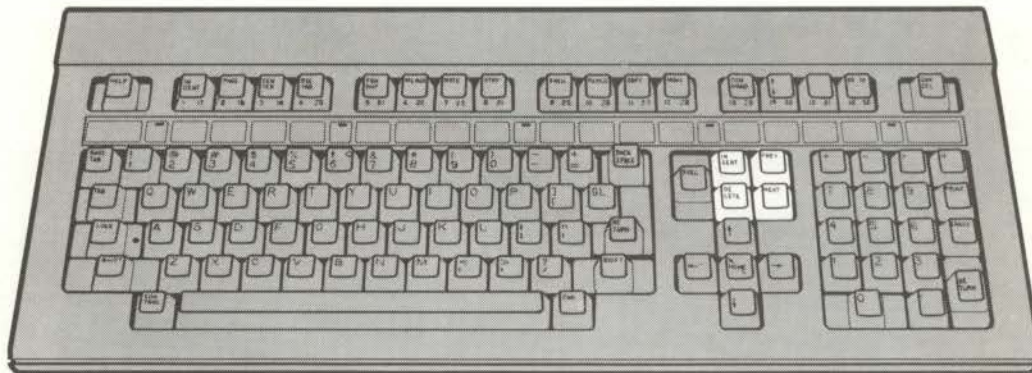


Figure 6-5. The Special Operations Keys

In general, the special operations keys perform the following functions within various applications.

INSERT -- Use INSERT to insert a character or series of characters within a field, within text, or to select an item on certain menu lists.

DELETE -- Use DELETE to delete a character or series of characters within a field. You can also use this key to deselect an item you previously selected in a menu list.

PREV -- Press PREV (the previous screen key) to move to the previous display. This key does not work in the system menus or within the operating system. In those cases, press CANCEL instead.

NEXT -- Press NEXT to proceed to the next display. NEXT does not work in the system menus or within the operating system. In those cases, make a selection and press EXEC instead.

6.8 SPECIAL FUNCTION KEYS

Within various applications, this group of sixteen keys can be programmed to have special functions. The keycaps are labelled with the Wang Word Processing function names, since Word Processing is a widely used type of software. The Wang Professional Computer Word Processing Reference Guide describes the function of each of these keys in detail.

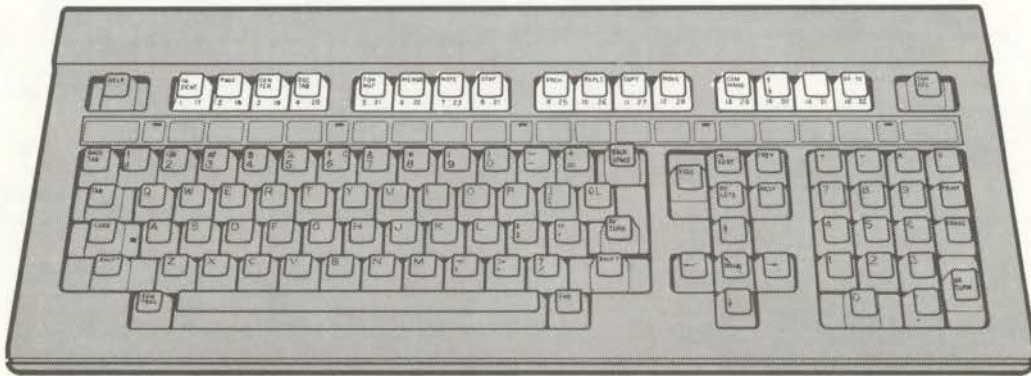


Figure 6-6. The Special Function Keys

In addition to PC Word Processing, many other types of software, including Multiplan, use the special function keys. Since the meaning of each key is different in Multiplan than in Word Processing, the labels on the keys are less than helpful if you're trying to use Multiplan. Therefore, Wang provides a new strip of labels, called a function strip, for many Wang-supplied software packages. These strips have an adhesive backing so that you can place them on your keyboard below the special function keys. You attach a function strip to the keyboard by positioning the strip so it is aligned with the proper function keys, and pressing it in place (refer to Figure 6-7).

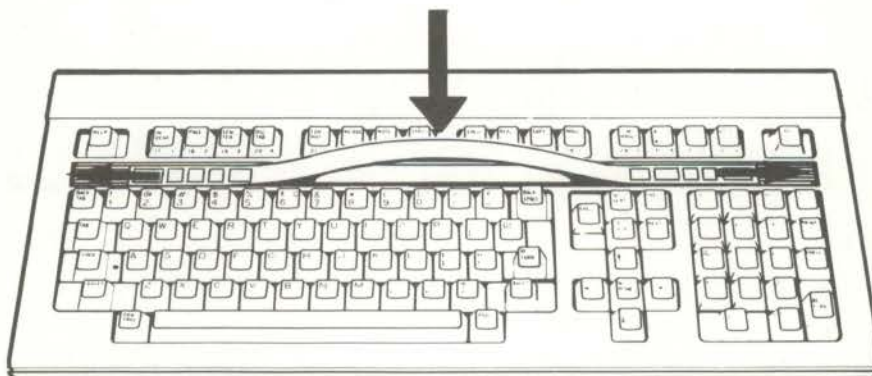


Figure 6-7. Installing a Function Strip

The special function keys can be used in a shifted mode within certain applications to produce a total of 32 special functions. The numbers on the vertical face of each of these keys represent their special function numbers, with 1 through 16 being the unshifted forms and 17 through 32 the shifted forms.

6.9 IMPORTANT KEYS AND KEYBOARD LEDs

You can use the keys described in this section to perform a wide range of functions. Though described last, they are among the most important keys for you to become familiar with. The keyboard LEDs are also defined in this section.

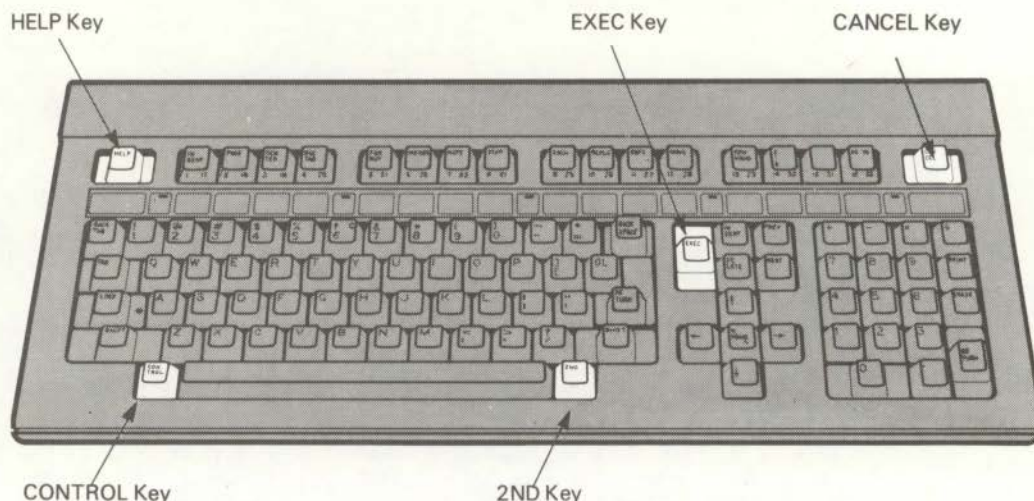


Figure 6-8. Important Keys and LEDs

HELP -- Press HELP to receive descriptions of the menu selections, functions, or commands available within a particular piece of software. These descriptions vary from one piece of software to another.

SHIFT + HELP -- Use this combination when you are in a Wang PC Word Processing document to produce a display that lists all the available Help screens (refer to Section 1.3.2).

CANCEL -- Press CANCEL while using the system menus to have the system ignore the work you've done in the present operation or selection and return to the previous operation or selection.

CONTROL -- Press CONTROL and one of the specified control code keys to perform specific functions.

2ND -- Press 2ND together with one of the specified 2ND code keys to perform special functions.

2ND + COMMAND, and then CANCEL -- Press 2ND + COMMAND simultaneously and then press CANCEL to restart the system. Refer to Section 3.3 for details.

EXEC -- Press EXEC to tell the computer to accept a display and to begin to carry out the function you selected.

The LEDs -- The 5 LEDs (Light Emitting Diodes) are used during the power-on diagnostics to indicate the status and results of the diagnostic tests. After you start your system, the LEDs can perform various functions within particular applications.

7

USING THE WANG PC SYSTEM SCREENS

Introduction

The Date and Time Screen

The Main System Menu

Loading and Exiting a Selection

Loading and Running Interpretive BASIC

CHAPTER 7

USING THE WANG PC SYSTEM SCREENS

7.1 INTRODUCTION

As discussed in Chapter 4, the Wang Professional Computer functions interactively by means of prompts. You communicate with the Wang PC by responding to these prompts as they appear on the screen. This chapter describes the series of screens and prompts that appear when you start the system with System Diskette I. The displays in which these prompts occur are known as system screens. Most of the screens on the Wang PC fit the descriptions in this chapter. However, some applications, such as PC Multiplan, PC Database, and PC Business Graphics use different screen designs. Refer to the documentation that accompanies these applications for a description of their screens.

As mentioned in Section 3.1, when you start the Wang PC, the monitor briefly displays the Start-up screen with the version number of your system. If the default drive contains a diskette with the system files, a second screen appears briefly to display the version number and copyright of the MS-DOS operating system. If you have installed a device driver (refer to Appendix I), this screen also displays the name of the driver you have installed. In normal operation, the next screen that appears contains a date and time prompt. This Date and Time screen is followed by the Main System Menu, offering choices that lead you to all the functions of the Wang PC. The screens that follow the Main System Menu depend on the choice you make from that menu.

The normal sequence of system screens may not appear if the diagnostic tests encounter an error. (Refer to Appendix B.) The sequence may also be interrupted if there is a problem with a diskette containing the system files, if you have modified the system software to display the DOS Command Processor prompt instead of the Main System Menu, or if System Diskette I contains a file named AUTOEXEC.BAT. (Refer to The Wang Professional Computer Utility Programs User Guide.)

As you purchase additional software, you may want to modify the system menus or add new menus by using the MODIFY SYSTEM MENUS utility. The Wang Professional Computer Utility Programs User Guide discusses this utility.

The system screens are designed for monitors with 80-character line displays. If your monitor has a 40-character line, you must use the DOS Command Processor rather than the system menus to give instructions to the computer. For either type of monitor, you can go directly from the Date and Time screen to the DOS Command Processor by pressing SHIFT + FORMAT. Refer to Section 7.3.6 of this manual and The Wang Professional Computer Utility Programs User Guide for explanations of the DOS Command Processor.

NOTE:

The screen descriptions in this chapter apply to the system screens as shipped by Wang Laboratories, Inc. The descriptions may not apply to screens created or altered after shipment of the system.

7.1.1 System Screen Design

A system screen is normally divided into three main areas. The title of the screen appears at the top. The body of the screen, which contains the prompts by which you communicate with the computer, occupies the middle of the screen. The bottom of the screen is a message area containing two sections of its own. The left-hand section is reserved for error messages or other messages that appear only in special situations. (For instance, whenever you give the computer a command that takes a few seconds to process, a message appears to let you know the command is in progress. Otherwise, you might think the delay meant something had gone wrong.) The right-hand section of the message area lists the keys you use with that screen to give instructions to the computer. Figure 7-1, the Wang PC Main System Menu, illustrates a typical system screen.

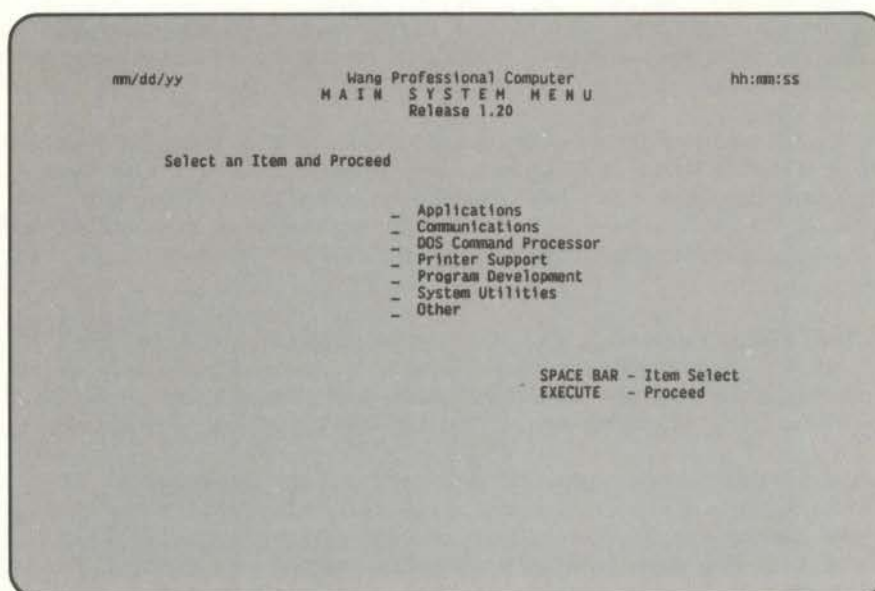


Figure 7-1. The Wang PC Main System Menu

7.1.2 Key Usage

A brief description of the major key functions for each screen also appears in the right-hand portion of the message area. In certain applications, some of the keys on the keyboard are nonfunctional. When you press a nonfunctional key, a beep sounds.

The keys named in the right-hand portion of the message area are usually not the only ones that are functional within a particular screen. The functions of some keys are so common that repeating them is unnecessary. For example, the message area does not tell you that you can use the standard typewriter keys to respond to a prompt. Similarly, the function of the HELP key, described in the next section, is the same for each screen and is therefore not listed in the message area.

When the body of the screen is a menu, the message area includes the following:

SPACE BAR - Item Select

This tells you to press the space bar in order to move the acceptance block from item to item. When the acceptance block is at the last item in the list, pressing the space bar moves it back to the first item.

On most menus, you can also move the acceptance block by pressing the alphabetic key that corresponds to the first letter of the item you want. For example, on the Main System Menu, pressing uppercase or lowercase A moves the acceptance block directly to Applications from anywhere else on the menu.

When you have moved the acceptance block to the item you want or entered the parameters called for by a prompt, you must still tell the computer to process the instruction. The key you use to send an instruction from the system screens to the computer is EXEC. On most system screens, the function of the EXEC key is listed as follows in the right-hand section of the message area:

EXECUTE - Proceed

In other words, pressing the EXEC key tells the computer to process the instruction you have selected and go to the next screen.

When a screen prompts you for parameters, the position of the cursor shows you where to begin typing each parameter value. If the value you enter takes up the entire field, the cursor remains in the last (right-hand) position in the field. At any time, you can move the cursor to the next field by pressing RETURN. If the cursor is at the last field on the screen, pressing the RETURN key moves it to the first field. On most system screens, the function of the RETURN key is listed as follows in the right-hand portion of the message area:

RETURN - Go To Next Field

To correct an error before moving to another field, you can use the BACK SPACE key or the West cursor control key to move the cursor to the left within the field. To correct an error in a previous field, use the RETURN key to bring the cursor back to that field.

7.1.3 The HELP Key

The HELP key is in the upper left-hand corner of the keyboard. Pressing this key gives you information about whatever screen is currently displayed. If the screen asks you to supply parameters, pressing HELP gives you information about the acceptable values for those parameters. If the screen is a menu, pressing HELP gives you information about whatever menu item the acceptance block is next to. To return from the Help screen to the original screen, press CANCEL.

7.2 THE DATE AND TIME SCREEN

Figure 7-2 shows the Date and Time screen. This screen allows you to enter the current date and time. The computer records this information in the disk directory. Entering the date and time before you edit a file or make a backup copy of it is a good habit to get into, since it ensures that you will always know which copy of a file is the most recent.

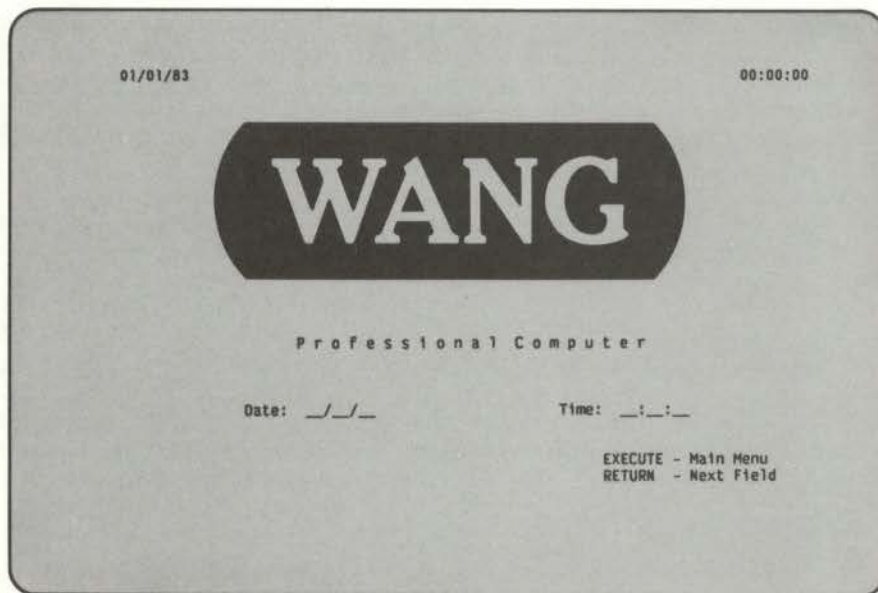


Figure 7-2. The Date and Time Screen

If the date and time are not necessary for what you plan to do during a session, you do not need to supply these values. Instead, press EXEC to go to the next screen. If you do not enter the time and/or date, the computer's clock increments the time from zero and the date from January 1, 1983. If you later need to set the date or time, you do not have to return to the Date and Time screen. The SET DATE and SET TIME utilities on the System Utilities Menu allow you to enter the current date and time. (Refer to The Wang Professional Computer Utility Programs User Guide for a description of these utilities.)

If you wish, you may respond to the prompt displayed on the Date and Time screen by entering the date or time or both. As long as the computer is on, an internal clock increments the time and date starting from the values you enter here. The computer knows whether the month has 28, 29, 30, or 31 days and whether the year is a leap year. You must use numeric keys to enter the date and time, as the computer does not recognize letters in these fields.

You must enter the numbers in 2-digit form. For example, enter 1 as 01, 2 as 02, and so on. Unless you are using a format other than the U.S. Standard format for the date, you must enter the date values in the month/day/year format. (To use a different format, refer to the discussion of the SET NATIONAL DEFAULTS utility in The Wang Professional Computer Utility Programs User Guide.) The month entry must be a number between 01 and 12. The day must be a number between 01 and 31. The year must be a number between 80 and 99.

In the U.S. standard format for time, you must enter the time values in the hour:minute:second format. (Refer to the discussion of the SET NATIONAL DEFAULTS utility in The Wang Professional Computer Utility Programs User Guide for other national formats.) The minute and second entries must be numbers between 00 and 59. (The second entry is optional.) The hour must be a number between 00 and 23. Midnight is 00; noon is 12. To translate pm times other than noon from the standard clock to the 24-hour clock, just add 12 to the hour on the standard clock. For example, 1 pm on the standard clock becomes hour 13 on the 24-hour clock, 2 pm on the standard clock becomes hour 14 on the 24-hour clock, and so on.

When you have entered the values you want, press EXEC. Unless you have entered an invalid value, the Main System Menu appears. If you have entered an invalid value, a message appears telling you which field is invalid. For example, if you enter 25 for the hour, the message "Invalid Hour" appears. Enter a valid hour and press EXEC, or press CANCEL to start the process again.

7.3 THE MAIN SYSTEM MENU

The system screen that appears after the Date and Time screen is the Wang PC Main System Menu (Figure 7-1). The column in the center of the Main System Menu is a list of options from which to choose. An acceptance block appears immediately to the left of the first item on the list. To select an option from the menu, press the space bar to move the acceptance block to the option you want. Then press EXEC.

The following sections give brief descriptions of each of the options on the Main System Menu, with references to more complete descriptions elsewhere in the Wang PC manuals.

7.3.1 Applications

Applications are programs you use to achieve a specific practical objective. For example, the Multiplan program helps you answer specific business and financial questions, and Wang PC Word Processing facilitates the writing, editing, and printing of text.

As soon as you select the Applications option on the Main System Menu, the Applications Menu appears on the screen. (Refer to Figure 7-3.)

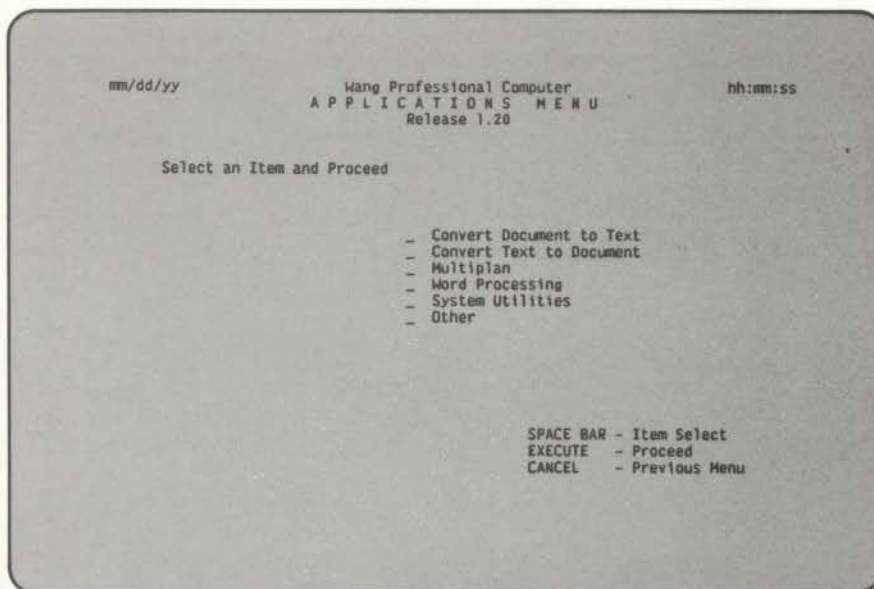


Figure 7-3. The Applications Menu

The options on this menu include PC Multiplan and Word Processing. The manuals that accompany these applications explain them in detail. This menu also contains two programs known as conversion aids. One of these conversion aids allows you to convert Wang Word Processing documents to the format of program files, such as Multiplan spreadsheets. The other conversion aid allows you to convert program files to Wang Word Processing documents. In addition, you can integrate program files with Word Processing documents, or Word Processing documents with program files.

If you have not purchased Multiplan or Word Processing with your system, you will not be able to access the options on the Applications Menu. You can use the MODIFY SYSTEM MENUS utility to delete them, or to add the names of other options you have purchased.

7.3.2 System Utilities

System utilities are general purpose programs that support other functions of the computer. For example, system utilities allow you to add or delete files from a diskette, reset the date or time, combine files, or make copies of diskettes. You are likely to use the System Utilities option frequently.

As soon as you select the System Utilities option, the System Utilities Menu appears on the screen. Figure 7-4 illustrates this menu. The Wang Professional Computer Utility Programs User Guide discusses the System Utilities Menu and each of the items on it in detail.

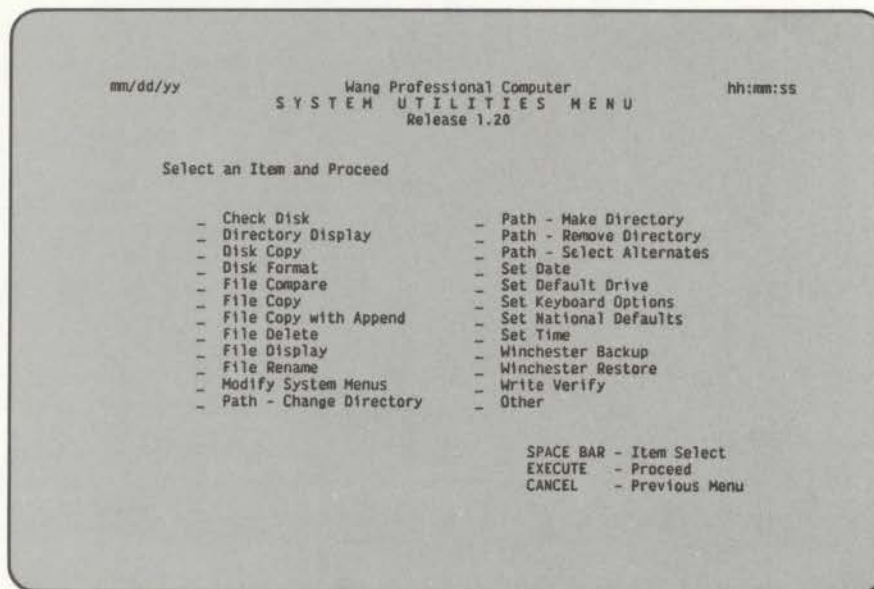


Figure 7-4. The System Utilities Menu

7.3.3 Program Development

The Program Development Menu lists programs that are useful for writing, correcting, modifying, and running other programs. For example, the Program Development Menu lists an option named BASIC. Selecting this option allows you to use the programming language known as interpretive BASIC. The Program Development Menu also lists an option named Editor that allows you to create and modify text files such as reports and letters.

When you select Program Development from the Main System Menu, the Program Development Menu appears. Figure 7-5 illustrates the Program Development Menu.

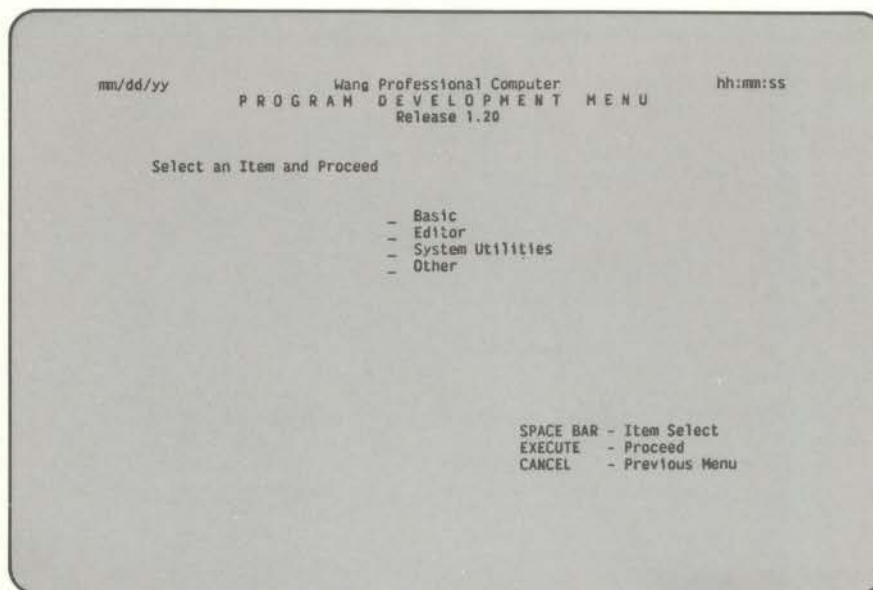


Figure 7-5. The Program Development Menu

Refer to The Wang Professional Computer BASIC Language Guide for a description of interpretive BASIC. Refer to The Wang Professional Computer Program Development Guide for a description of the other options on this menu.

7.3.4 Communications

When you select Communications from the Main System Menu, the Communications Menu appears. (Refer to Figure 7-6.) The options on this menu allow the Wang PC to serve as a workstation on Wang 2200, VS, OIS, or Alliance systems or to communicate with a host computer. As a workstation on any of these multiuser Wang systems, the Wang PC has access to the software, data, and resources of that system. Communicating with host computers allows you to access time-sharing systems and to speedily collect, transfer, and analyze data, including data from business information services and commercial data bases.

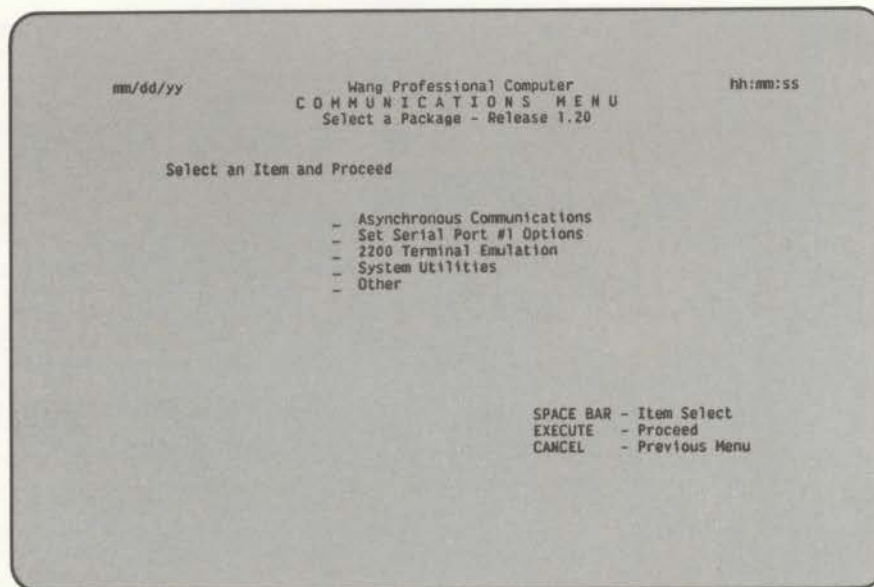


Figure 7-6. The Communications Menu

The items on the Communications Menu are optional on the Wang PC. If you have not purchased the appropriate software, you cannot use the corresponding option on the Communications Menu. Refer to the appropriate communications manuals for descriptions of the Communications Menu options.

7.3.5 Printer Support

When you select the Printer Support option from the Main System Menu, the Printer Support Menu shown in Figure 7-7 appears.

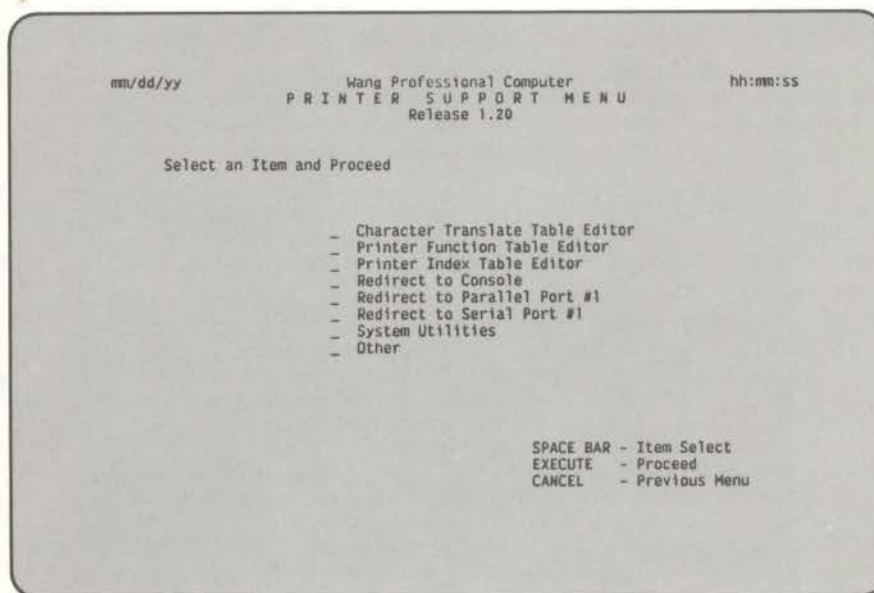


Figure 7-7. Printer Support Menu

This menu lists options that create the printer table structures that are necessary for a printer driver to function with a given printer. The Printer Function Table Editor and Character Translate Table Editor options let you edit and/or create printer table and character translate table files. You then enter the names of these files in the printer index table with the Printer Index Table Editor option. The Printer Support Menu also includes three print redirection options that allow you to direct the system to the console, parallel port, or serial port.

Appendix I explains the options on the Printer Support Menu in detail.

7.3.6 DOS Command Processor

The DOS Command Processor option offers you a way to give instructions to the computer without using menus. When you select this option from the Main System Menu, the following prompt, known as the DOS prompt, appears on the screen:

A: _

You respond to this prompt by typing in a DOS command (refer to The Wang Professional Computer Utility Programs User Guide) or a file specification and then pressing RETURN. A file specification consists of a 1- to 8-character file name, optionally preceded by a directory path, and optionally followed by a 1- to 3-character extension. Refer to The Wang Professional Computer Utility Programs User Guide for a complete explanation of file specifications.

The letter A designates the default drive. A different letter may appear if you have changed the default drive. The Wang Professional Computer Utility Programs User Guide describes how to change the default drive while using the DOS Command Processor. You can also change the default drive by using the SET DEFAULT DRIVE system utility.

From the Command Processor, you can execute any program that appears on any of the other menus. You can also use the Command Processor to execute any of your own programs, except those written in interpretive BASIC. To get from the Command Processor to programs written in interpretive BASIC, you must first instruct the computer to run interpretive BASIC, as explained in Section 7.5. Refer to The Wang Professional Computer Utility Programs User Guide for a more detailed description of the Command Processor.

7.3.7 Other

Like the DOS Command Processor option, the option called Other allows you to execute programs without using menus. The main difference between these two options is the screen each one returns to when a program called from it has executed. The DOS Command Processor option returns to the DOS prompt. The Other option returns to the Main System Menu. Another difference is that you cannot execute batch command files (refer to The Wang Professional Computer Utility Programs User Guide) from the Other option.

When you select Other from the Main System Menu, the following prompt appears:

File Spec:

You respond to this prompt by supplying a file specification for the program you want to execute. To execute the program, you can press either the EXEC or the RETURN key.

The drive you request in the file specification for the Other option becomes the default drive for the duration of the program you specify. Thus, if that program accesses another file, the computer looks for the file on the drive you requested, unless you supply a different drive designation for the file. However, if the program you execute from the Other option changes the default drive while executing, the drive it establishes remains in effect when you return to the Main System Menu.

7.4 LOADING AND EXITING A SELECTION

When you use any of the methods just described to instruct the computer to load and run a program, the computer searches for that program on a diskette or on the Winchester. If you make a selection from the Applications, System Utilities, Program Development, or Communications Menus, the computer searches for the program on the default drive. If you execute a program in BASIC or through the DOS Command Processor or Other options, the computer uses the default drive unless you designate another drive in the file specification.

If it finds the program, the computer loads it into memory and executes it. If it does not find the program, the computer displays a "File not found" message. In this case, in order to execute the program, you must load a diskette containing the program in the proper drive and press any key but CANCEL. You do not have to repeat the process of selecting the program. For example, if the computer could not find the FILE COPY program you selected from the System Utilities Menu, then as soon as you put the correct diskette in the default drive and press any key except CANCEL, the computer once again searches the diskette for FILE COPY.

To save time, it is better to mount a diskette containing a program before you call that program. Once you have loaded the system files, you can remove that diskette from the default drive and insert another diskette before calling your program.

When the computer has completed running the program you requested, it returns you to the same screen from which you selected the program. If you requested a program from the DOS Command Processor, the system returns you to the DOS prompt. To return to the Main System Menu from the DOS prompt, type the word EXIT and press RETURN.

If you requested a program from one of the options listed on the Main System Menu, you return to the menu you selected. From there, you can return to the Main System Menu by pressing CANCEL. If you requested a program from the Other option on the Main System Menu, you return to the Main System Menu.

Often you exit from a program by responding to a prompt displayed by the program itself. For instance, when the DISK FORMAT system utility has finished formatting a diskette, it asks you whether you want to format another diskette by displaying the following prompt:

Format another (Y/N)?_

To return to the System Utilities Menu, enter N and press EXEC.

In order for you to return to the place from which you requested a program, however, the default drive must contain a disk with the system files. If it does not, a message appears to inform you of this. To return to the place from which you requested the program, mount a diskette with the system files in the default drive and press any key.

As you work with your Wang PC, you may find it easier to put all the files you usually use on one diskette. This eliminates the need for you to switch diskettes in order to ensure that the file you want to access is in the default drive. Appendix J shows you how to do this.

7.5 LOADING AND RUNNING INTERPRETIVE BASIC

All Wang PC systems include the interpretive BASIC programming language. Using BASIC, you can write, revise, store, and run your own programs. To call BASIC from the Program Development Menu, select the Program Development option from the Main System Menu. Make sure that the acceptance block is next to the BASIC option. Replace System Diskette I with System Diskette II and press EXEC. To call BASIC from within the DOS Command Processor or from the Other option on any menu, make sure that System Diskette II is in the default drive, then type the word BASIC and press RETURN.

When you select BASIC, the letters "Ok" appear on the upper left-hand side of the screen. This is the BASIC prompt. You begin giving instructions to BASIC at the cursor position below the prompt. If you want to load and run a BASIC program that already exists, type Load" followed by the program name and press the RETURN key. When the Ok prompt appears again, type RUN and press RETURN to execute the program. Alternately, you can press PF 3, enter the program name, and press RETURN. You then need only press PF 2 to start program execution. Refer to The Wang Professional Computer BASIC Language Guide for a further discussion of this method.

When your BASIC program has executed, the BASIC prompt returns to the screen. If you do not wish to use BASIC further, you can return to the screen from which you entered BASIC by typing the word SYSTEM after the BASIC prompt, inserting System Diskette I, and pressing the RETURN key. You can also exit from BASIC by first inserting System Diskette I in the default drive, and then typing the system restart sequence: 2ND + COMMAND, followed by CANCEL. When you exit using this method, the Date and Time screen, not the Main System Menu, appears on the monitor.

For instructions on how to create, store, and modify programs in BASIC, refer to The Wang Professional Computer BASIC Language Guide.

8

USING YOUR WINCHESTER DISK DRIVE

Overview

Copying the System Diskettes
to Your Winchester Disk

Controlling Your System
Through the Winchester Disk

Starting Your System from the Winchester Drive

Loading an Application

CHAPTER 8

THE WINCHESTER DISK DRIVE

8.1 OVERVIEW

A Winchester disk drive is an auxiliary storage device. It contains a read/write head that can read information from the disk or write information onto the disk. Unlike a diskette drive, the Winchester is a sealed unit that stores information on hard disk.

When the disk in the Winchester drive is correctly formatted, it can store up to 10MB of information, or more than twenty-six times the capacity of a single 360KB diskette. A more dramatic way of illustrating the amount of information you can store on a 10MB Winchester disk is to convert the number of megabytes into an equivalent number of typewritten pages. A full 10MB Winchester disk can hold the equivalent of approximately 4,000 single-spaced typewritten pages.

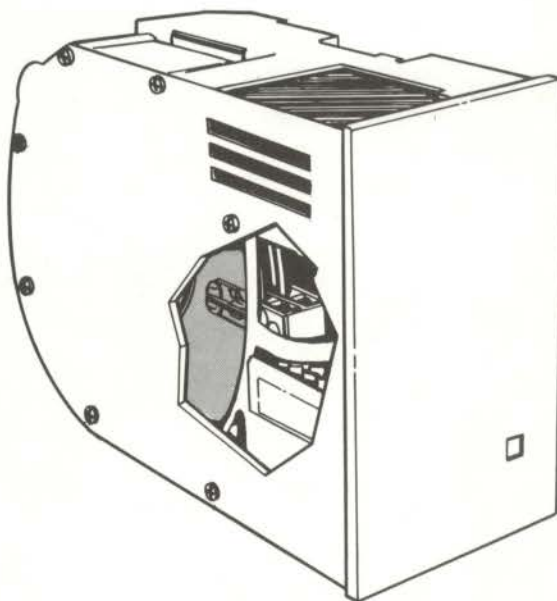


Figure 8-1. Inside a Winchester Drive

The front of your Winchester disk drive has a red indicator light that lights up whenever the drive is reading or writing. Your Winchester can hold any software, including the system software. You can start your system through the Winchester once you copy the system software onto it. Once you have done this, you can access all of the system menus from the Winchester drive. The Winchester is known as Drive C within the Wang PC system.

Sections 8.2 through 8.4 discuss the procedures for copying System Diskettes I and II to the Winchester disk and subsequently starting your system from this drive. Before you perform these tasks, you should read Section 9.3, which provides instructions for installing your Winchester drive. You should also read the section in The Wang Professional Computer Utility Programs User Guide that explains path names and multilevel directories.

8.2 COPYING THE SYSTEM DISKETTES TO YOUR WINCHESTER DISK

Use the following steps to guide you through the process of copying the system software onto the Winchester disk.

CAUTION:

The following procedure formats the Winchester disk and in so doing erases all of the files currently on it. If you want to save any of the files on the Winchester disk, copy those files onto diskettes before you begin this procedure.

STEP 1: Start your system with System Diskette I in Drive A, if you have not already done so.

STEP 2: Select the System Utilities option from the Main System Menu.

STEP 3: Select the DISK FORMAT utility from the System Utilities Menu. You should see the DISK FORMAT display shown in Figure 8-2.

```

SYSTEM UTILITIES - DISK FORMAT

Drive: A

Define Disk Storage Capacity
_ 360 KB   _ 320 KB   _ 180 KB   _ 160 KB   _ Winchester

EXECUTE - Proceed
CANCEL  - Return to Menu
RETURN  - Go to next field

```

Figure 8-2. The DISK FORMAT Display

STEP 4: Change the A in the Drive field to a C and press RETURN. You have now instructed the system to format the Winchester disk in Drive C.

STEP 5: Use the space bar to set the acceptance block in the Define Disk Storage Capacity field next to the word Winchester. Press EXEC to begin the formatting process.

STEP 6: When the system finishes formatting the Winchester, return to the System Utilities Menu and select the FILE COPY utility.

NOTE:

Do not use the DISK COPY utility; the Wang PC does not support the DISK COPY utility on the Winchester.

STEP 7: The Input File field should be Drive A. Enter the Volume ID or skip the Volume ID field. Enter the all-purpose file specification *.* in the File ID field. This set of responses instructs the system to copy every file on the diskette in Drive A. Press EXEC.

STEP 8: After you press EXEC, a screen display appears. (Refer to Figure 8-3.) This display asks you to enter one of three options for copying existing files to the output disk. Since no files exist on the Winchester, it does not matter which option you choose for this procedure. (Refer to The Wang Professional Computer Utility Programs User Guide for an explanation of these options). Press EXEC.

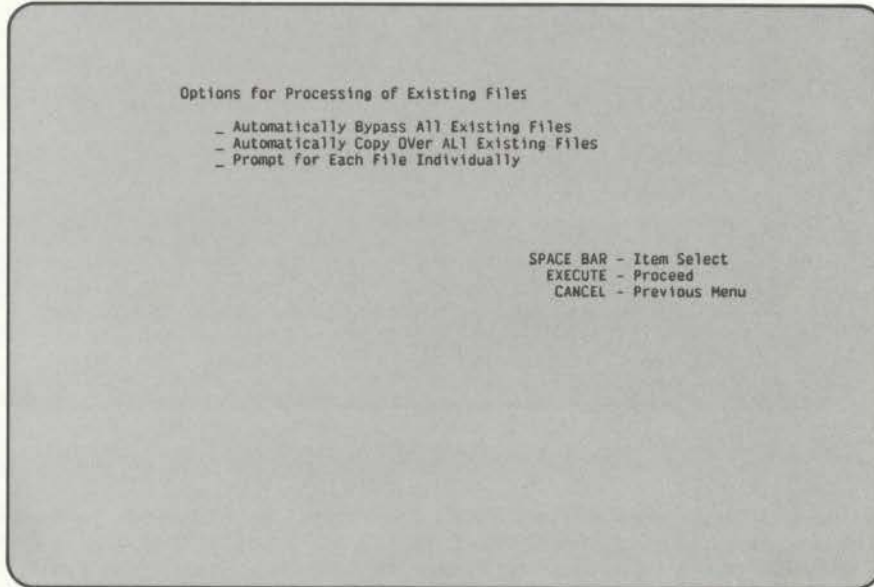


Figure 8-3. All-Purpose File Specification Processing Options

STEP 9: After you press EXEC, the parameters for the Output File appear on the utility display. Change the Output File field to Drive C. Enter the Volume ID or skip the Volume ID field. Leave the File ID field, *.* , as it is. This set of responses completes the FILE COPY utility by instructing the system to copy every file on Drive A over to Drive C, without changing any of the file names.

STEP 10: Press EXEC to begin the copying process. Notice that the indicator lights on both the diskette drive and the Winchester drive alternately go on and off as information is transferred between these two storage devices. When the system completes this process, you have successfully copied every file on System Diskette I onto your Winchester disk.

STEP 11: To copy System Diskette II to your Winchester, take System Diskette I out of Drive A. Replace it with System Diskette II. Repeat the process starting with Step 7.

NOTE:

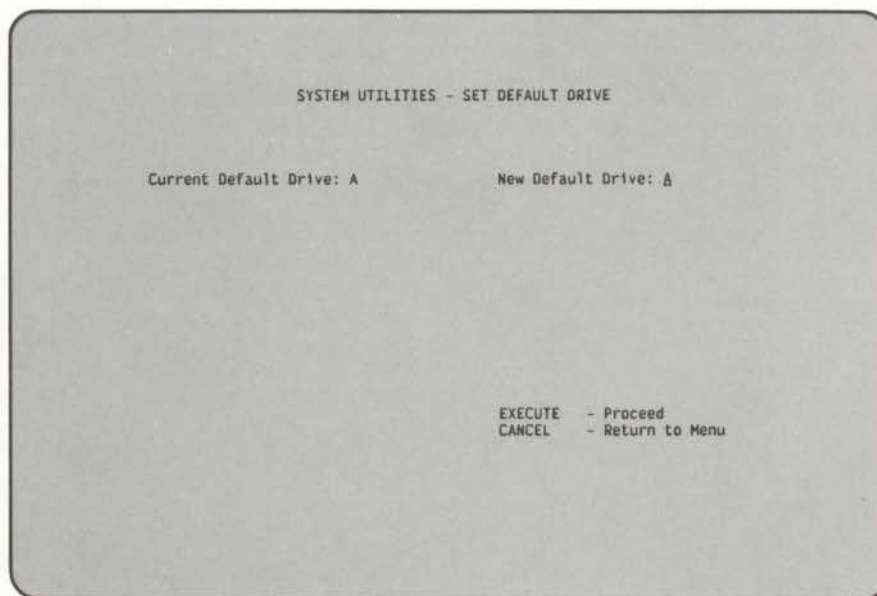
You can copy application diskettes to your Winchester by using a similar process. Once you have formatted the Winchester, select the FILE COPY utility. Take System Diskette I out of Drive A and replace it with your application diskette. Then follow the above procedure starting with Step 9.

8.3 CONTROLLING YOUR SYSTEM THROUGH THE WINCHESTER DISK

Your Winchester should now have a complete copy of both System Diskettes. At this point, however, Drive A still controls your system. If you want to transfer control of your system to the Winchester drive, follow these steps.

STEP 1: Go back to the System Utilities Menu.

STEP 2: Select the SET DEFAULT DRIVE utility from the System Utilities Menu. You should see the following display.



SYSTEM UTILITIES - SET DEFAULT DRIVE

Current Default Drive: A New Default Drive: A

EXECUTE - Proceed
CANCEL - Return to Menu

Figure 8-4. SET DEFAULT DRIVE Utility Screen

STEP 3: Your Winchester drive is known as Drive C. Enter C in the New Default Drive field and press EXEC. Drive C is now the default drive.

8.4 STARTING YOUR SYSTEM FROM THE WINCHESTER DRIVE

It is extremely easy for you to start your system using the Winchester disk. After you turn on your system, while the power-on diagnostic tests are running, the system checks to see which device it can start from. If it finds a diskette in Drive A that contains the system files, it starts from there. If it finds that the door to Drive A is open and that there is a copy of the system software on the Winchester, it starts from the Winchester. If it can't find a copy of the system software on the Winchester, it displays the message: ***41 START FAILED or ***44 SYSTEM FILES MISSING. Therefore, to start your system from the Winchester disk, simply do this:

STEP 1: Start your system with Drive A's door open. Be sure that a copy of the system software is on the Winchester disk.

NOTE:

If you have installed a PC Local Communications card or any other start option cards, make sure that the Remote/Local switch located on the back panel of the electronics unit is set at Local.

STEP 2: After the power-on diagnostics finish running, the Start-up screen should look like the sample screen shown in Figure 8-5.

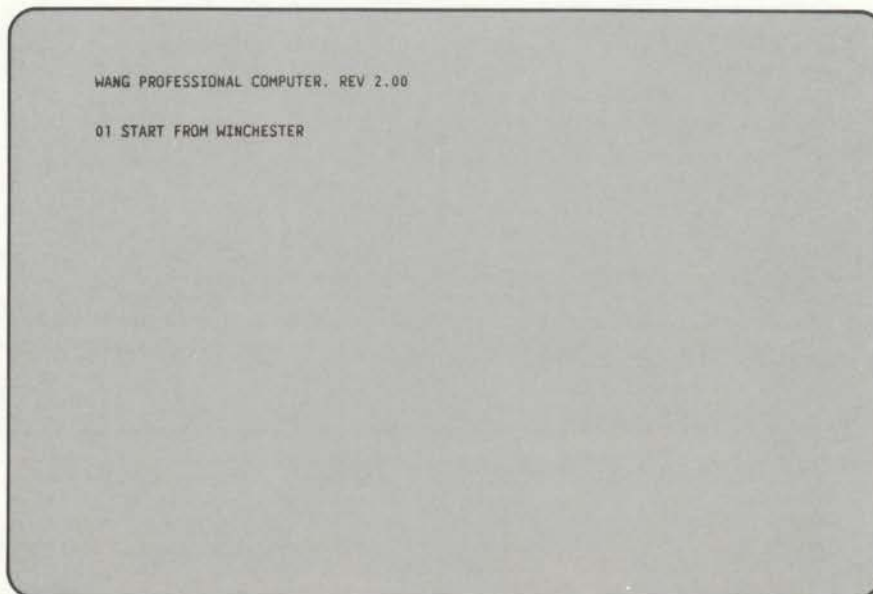


Figure 8-5. Sample Winchester Start-up Screen

NOTE:

If you have version 1.0 of the start PROM, the Winchester startup screen also includes the messages ***22 DRIVE B DEFECTIVE and 50 OR MISSING. These are merely informational messages that indicate that your system does not have a second diskette drive. These messages do not mean that you have a problem with your system.

STEP 3: After a 5-second delay, the Date and Time screen appears. Enter the date and time next to the appropriate prompts. Press EXEC to proceed to the Main System Menu.

You have now started your system through the Winchester drive. The system is running under the control of the system software located on the Winchester disk. If for any reason you need to restart your system, use the same keystroke sequence (2ND + COMMAND simultaneously, and then CANCEL) you use with Drive A. After you enter the restart key sequence, the system bypasses the power-on diagnostics and displays the Start-up screen.

8.5 LOADING AN APPLICATION

The process you use to load an application from the Winchester while you're using the Main System Menu is identical to the process you use with diskettes. Follow these steps to load an application.

STEP 1: Start your system from the Winchester, as described in Section 8.4. The Main System Menu appears on your screen.

STEP 2: Select the Applications option from the Main System Menu.

STEP 3: Insert the diskette for your application in the diskette drive. If your application is listed on the Applications menu, select it and press EXEC. Your application should now be running.

NOTE:

If your application is not listed on the Applications menu, check to see if it appears under another Main System Menu selection such as Communications or Program Development. If the application isn't listed on the menus, you need to use the MODIFY SYSTEM MENUS utility to add it to the appropriate menu. The MODIFY SYSTEM MENUS utility is described in The Wang Professional Computer Utility Programs User Guide.

9

ELECTRONICS UNIT OPTIONS

Understanding Cards

Installing a Card

Removing the Cover of the Electronics Unit

Unpacking the Card

Unscrewing the Panel

Sliding Out the Blank Panel

Aligning the Card

Inserting the Card

Replacing the Cover of the Electronics Unit

Reconnecting Your System

Testing Your Card

Installing a Winchester Disk Drive

Installing a Second Diskette Drive

Installing the Electronics Unit on the Desk Clamp



THE UNIVERSITY OF CHICAGO

The University of Chicago is a private research university in Chicago, Illinois. It was founded in 1837 and is one of the oldest and most prestigious universities in the United States. The university is known for its commitment to academic excellence and its wide range of research programs. It has a long history of producing world-class scholars and leaders in various fields of study. The university's campus is located in the Hyde Park neighborhood of Chicago, and it is home to over 10,000 students and faculty members. The University of Chicago is a member of the Association of American Universities and is ranked among the top universities in the world by various international ranking agencies.

CHAPTER 9

ELECTRONICS UNIT OPTIONS

This chapter provides the installation procedures for all the options currently available on the Wang PC electronics unit. These options include the Winchester disk drive, the second diskette drive, the optional desk clamp, and various option cards.

9.1 UNDERSTANDING CARDS

All Wang PC option cards have certain characteristics in common. They all contain a set of circuits that increase the capabilities of your Wang PC. Each card has a connector on its bottom edge containing 43 pins on each side, and a black metal panel on its vertical edge. (Refer to Figure 9-1.) Some cards have connectors built into these back panels; others do not. Back panels that have no connectors have a number of small holes covering them so that you can distinguish them from blank panels, which have no cards attached to them at all. These blank panels interlock with the cards installed in your electronics unit to form a solid back panel. Since each blank panel represents an available expansion slot, you can tell at a glance whether you have room to install any additional cards.

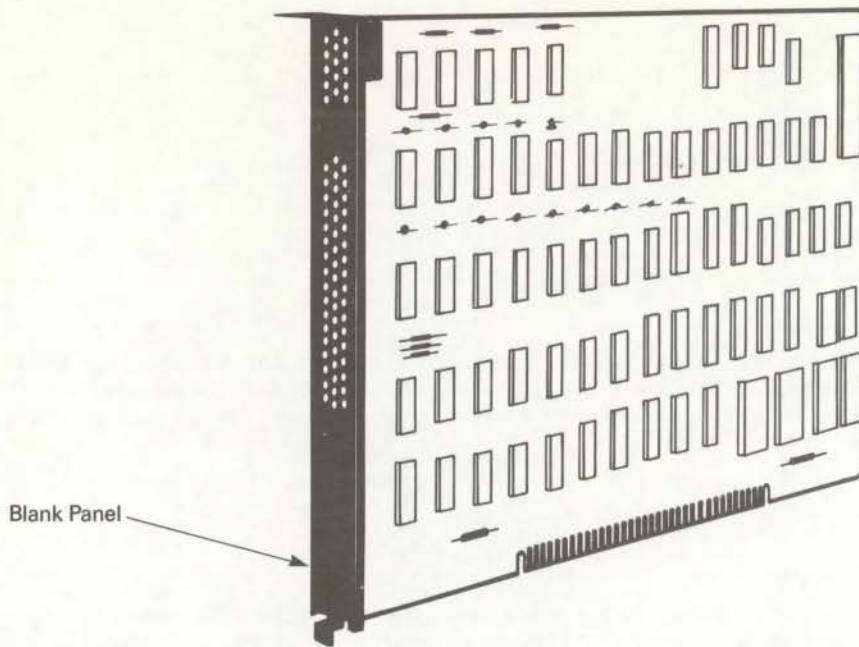


Figure 9-1. The Generic Wang PC Card

9.2 INSTALLING A CARD

As you read this section, you may find that your system is different from the one shown in the illustrations. For example, your system might have different types of cards already installed in different expansion slots. Regardless of any inconsistencies between the illustrations and what you see in your system, you can use the information presented in this section to help you install any card in any Wang Professional Computer system.

If you're working with a new Base Unit, the expansion slots are empty when you begin to install your first card. (Refer to Figure 9-3.) All preconfigured systems, on the other hand, will have at least the Wang Monochrome Monitor card installed in an expansion slot. You can check which cards are installed in your system by reading the name printed on the top of the circuit side of each card.

You can install any of the following cards in your electronics unit:

- CP/M-80 Emulation card -- This card allows you to use software written for the CP/M-80 operating system.
- Wang Monochrome Monitor card -- This card supports the Wang Monochrome Monitor.

- Wang Graphics card -- You can use this card in conjunction with the Wang Monochrome Monitor card to provide your Wang Monochrome Monitor with graphics capabilities.
- Industry-standard Monitor/Graphics card -- This card supports monitors other than the Wang Monochrome Monitor.
- Memory Expansion card -- This card permits you to add up to 512KB of memory, in 128KB modules, to the original 128KB that is standard with your system.
- Telecommunications cards -- There are several types of telecommunications cards that perform data formatting and control functions to facilitate data transmission and reception.

The installation procedures for all of these cards are virtually identical. You must, however, observe the following restrictions in positioning and installing your cards:

- You can only use the Wang Graphics card in conjunction with the Wang Monochrome Monitor card. You must position the Wang Graphics card in the slot behind the Wang Monochrome Monitor card. (For example, if the Wang Graphics card is in Slot 3, you must install the Wang Monochrome Monitor card in Slot 2.) You must also install the Wang Graphics card first. Use the short jumper cable shown in Figure 9-2 to connect the two cards.

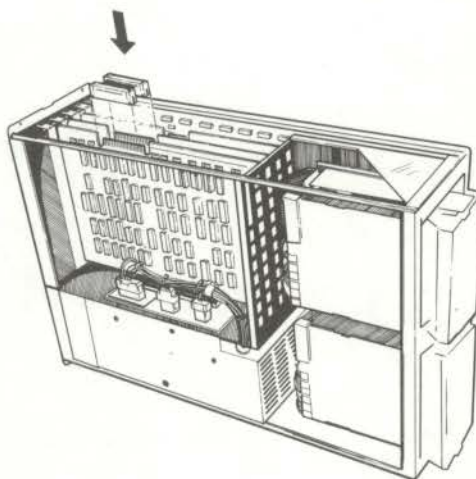


Figure 9-2. Jumper Cable

- If your system has a Winchester drive, you must install the Winchester Controller card in the slot furthest from the System card. Figure 9-3 shows the expansion slot numbers.

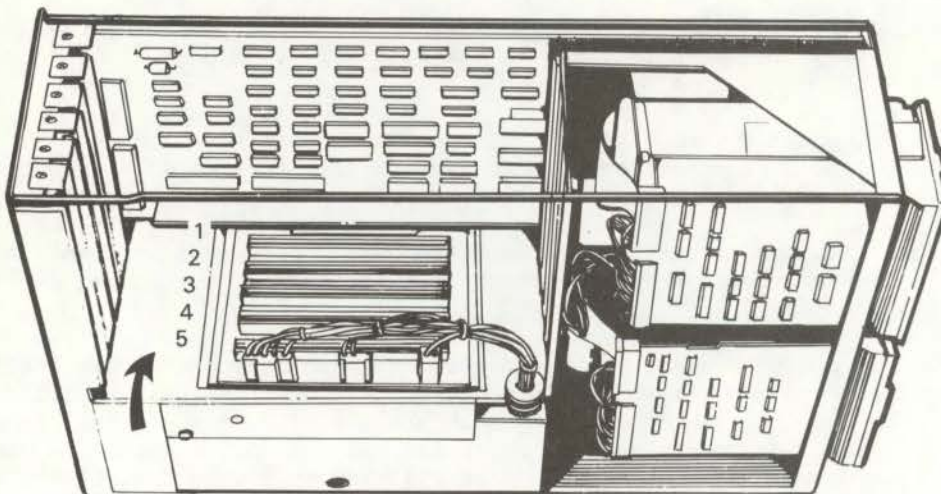


Figure 9-3. Expansion Slot Numbers

The procedure for installing a card in your electronics unit consists of the following steps:

- Removing the cover of the electronics unit
- Unpacking the card
- Unscrewing the panel
- Sliding out the blank panel
- Aligning the card
- Inserting the card into the guides
- Replacing the cover of the electronics unit
- Reconnecting your system
- Testing your card

The following pages provide a step-by-step description of this procedure.

9.2.1 Removing the Cover of the Electronics Unit

Before you can install a Winchester drive, you must remove the cover of the electronics unit.

STEP 1: Make sure the power switch is turned off. Then, disconnect the power cord from the electronics unit using a standard screwdriver. Disconnect your monitor, keyboard, and any remaining printer or communications cables. The electronics unit should be free of any external cables before you proceed. (Refer to Figure 9-4.)

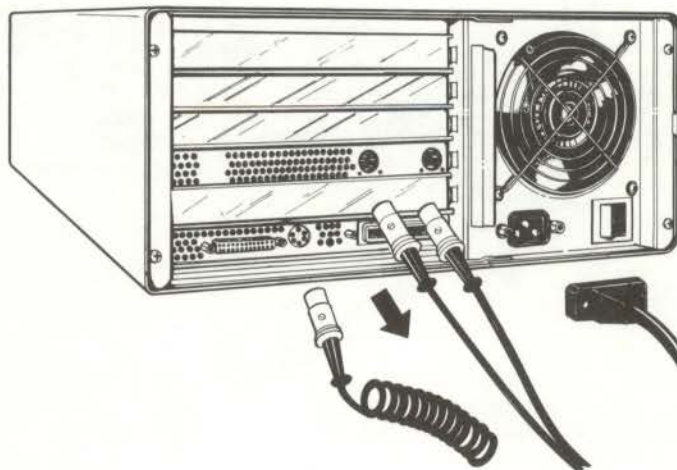


Figure 9-4. Disconnecting Your System

STEP 2: Position your electronics unit as shown in Figure 9-5. Be sure that there is room on your desk for the chassis to slide completely out of its cover toward you.

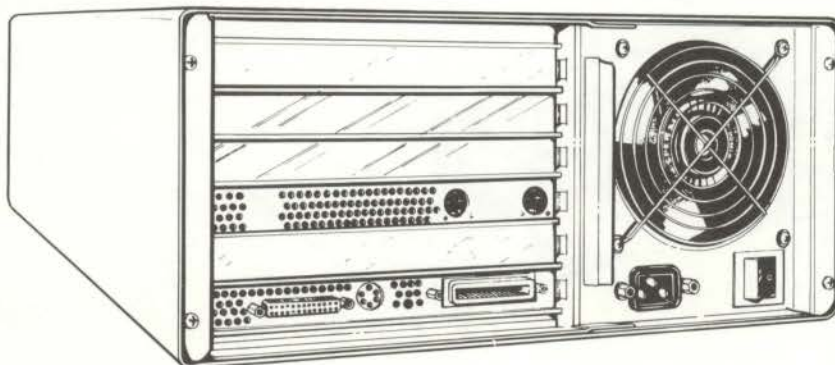


Figure 9-5. Positioning the Electronics Unit

STEP 3: Unscrew the four Phillips screws located in the corners of the back panel, as shown in Figure 9-6. Put these screws safely to one side; you will need them when you replace the cover.

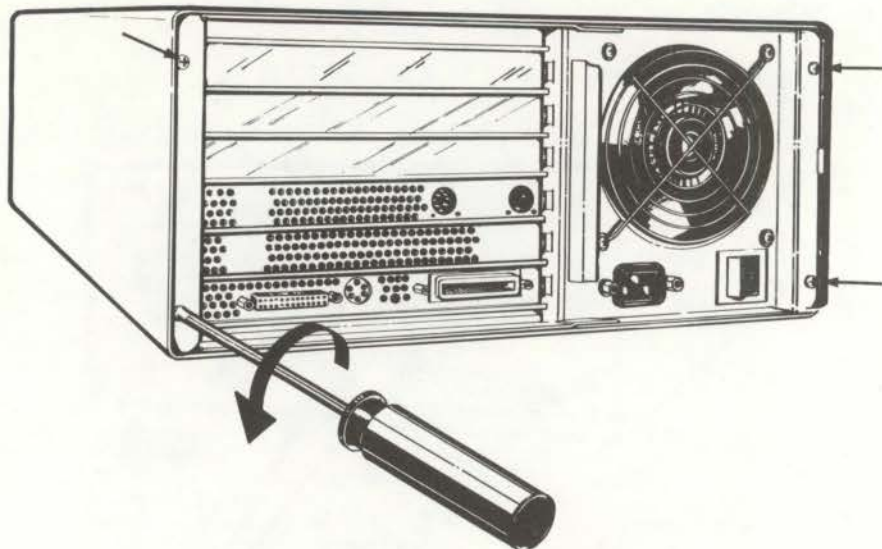


Figure 9-6. Removing the Four Cover Screws

STEP 4: Put one hand on the handle on the back panel. Place your other hand firmly on top of the electronics unit as shown in Figure 9-7.

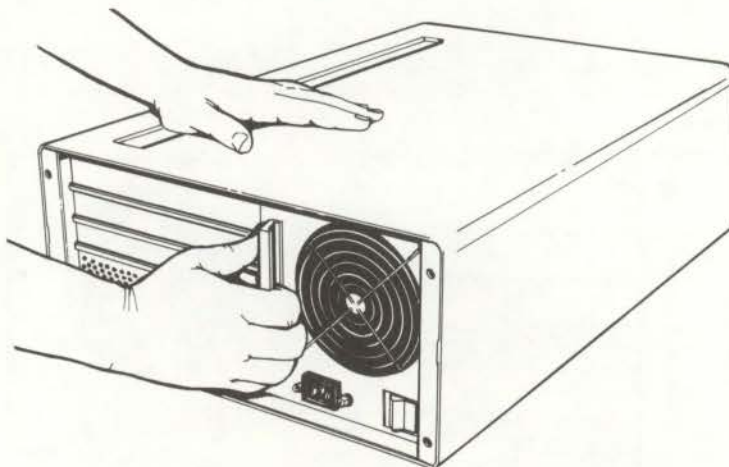


Figure 9-7. Preparing to Remove the Cover

STEP 5: Pull the chassis out of the cover, as shown in Figure 9-8.

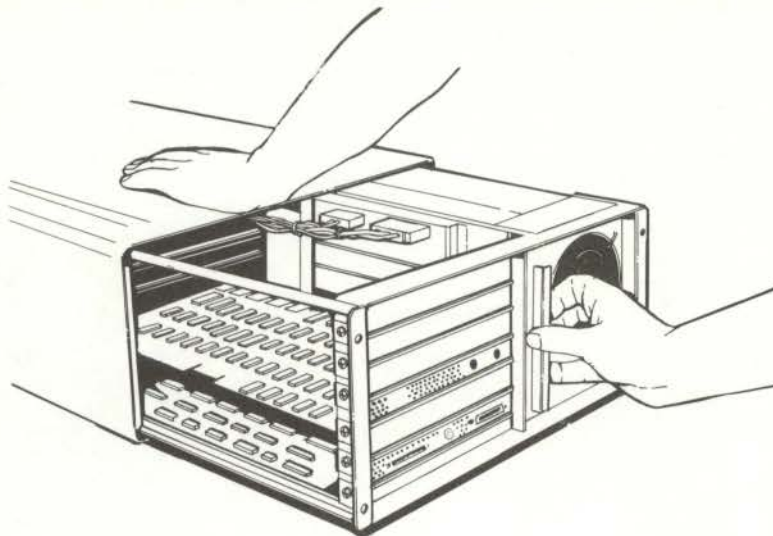


Figure 9-8. Removing the Cover

STEP 6: Move the cover off to one side of your work area.

STEP 7: Place the electronics unit in a vertical position, as shown in Figure 9-9. Remove the hold down device from the top of the electronics unit by following the directions on the label.

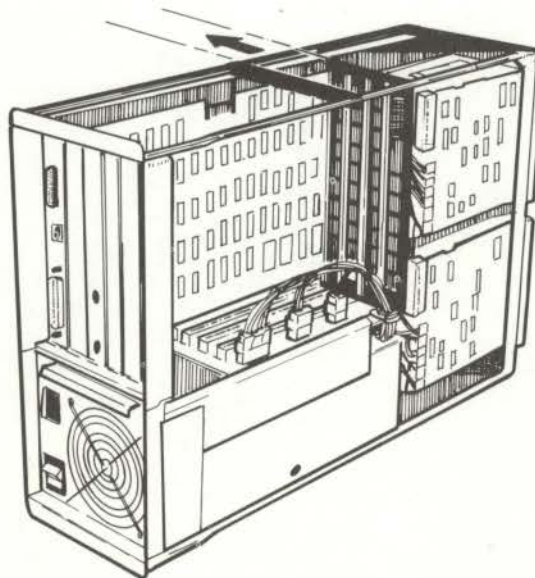


Figure 9-9. Working Position of the Electronics Unit

9.2.2 Unpacking the Card

Unpack the card as shown in Figure 9-10. Be sure to open the envelope containing the card along the edge indicated, or you may damage the card in the process of unpacking it. Keep the packing material with your other Wang PC packing material.

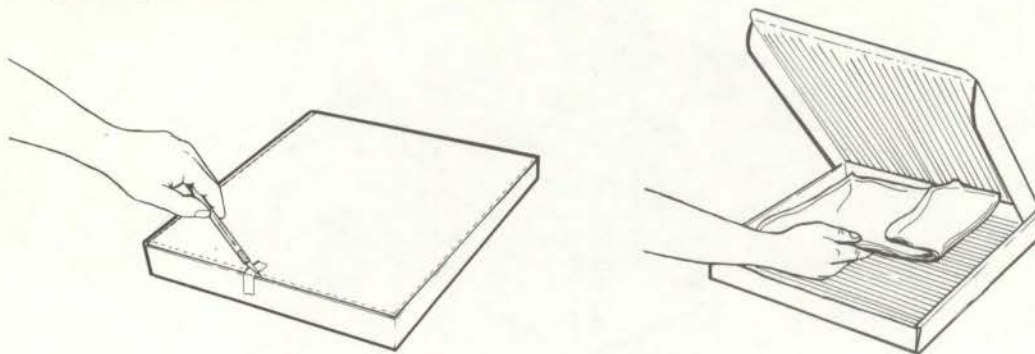


Figure 9-10. Unpacking a Card

9.2.3 Unscrewing the Panel

Remove the screw from the top of the panel that occupies the space where you want to insert a card. (Refer to Figure 9-11.) Put the screw to one side; you will need it again a little later.

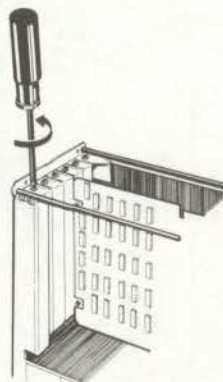


Figure 9-11. Unscrewing a Panel

9.2.4 Sliding Out the Blank Panel

Slide the blank panel out of its space in the electronics unit. You can do this by pushing up on the panel from underneath, as shown in Figure 9-12. Slide the panel up and out of the electronics unit.



Figure 9-12. Removing a Panel

9.2.5 Aligning the Card

Position the card you want to install above the electronics unit, so that its back panel is aligned with the other back panels. (Refer to Figure 9-13.)

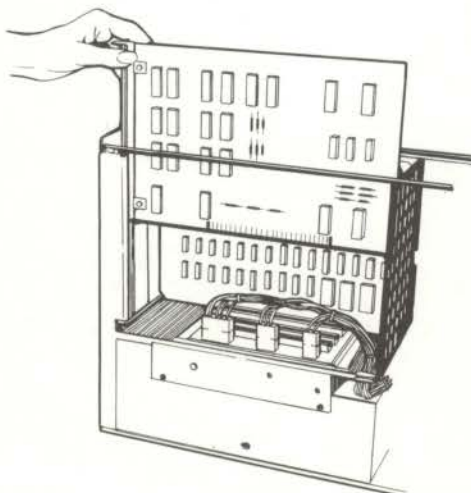


Figure 9-13. Aligning the Card

9.2.6 Inserting the Card

STEP 1: Slip the front of the card into the card guide while fitting its back panel into the interlocking back panels on either side of it.

STEP 2: Firmly press the set of pins on the lower edge of the card into place while fitting the tooth on the bottom of the panel into the slot in the chassis. The lip on top of the panel should fit flush on top of the chassis. The hole in the card's panel should line up with the hole in the chassis. When the holes are aligned, use the screw you removed from the blank panel to secure the card to the chassis. Your installed card should look like the one in Figure 9-14.

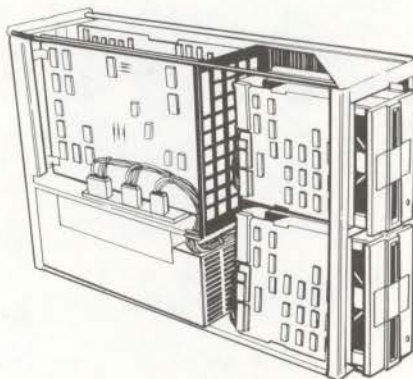


Figure 9-14. Completed Card Installation

STEP 3: If you are installing both the Monitor and Graphics cards, connect the two cards with the short jumper cable. When both cards are installed, the card assembly should look like the one in Figure 9-2.

STEP 1: Position the chassis and the cover as shown in Figure 9-15.

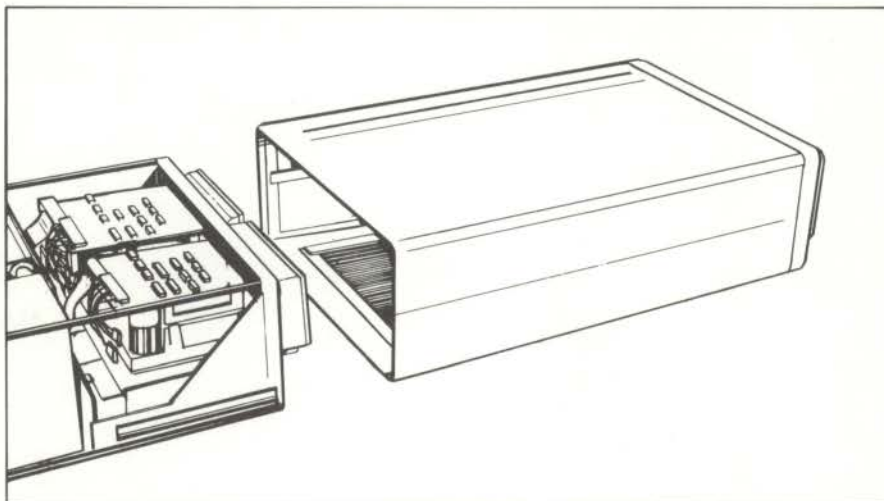


Figure 9-15. Preparing to Replace the Cover

STEP 2: Grasp each side of the chassis and lift it over the bottom edge of the cover. Slowly slide the electronics unit into the cover (as shown in Figure 9-16), placing one hand on the cover while using the other hand to push on the handle of the electronics unit.

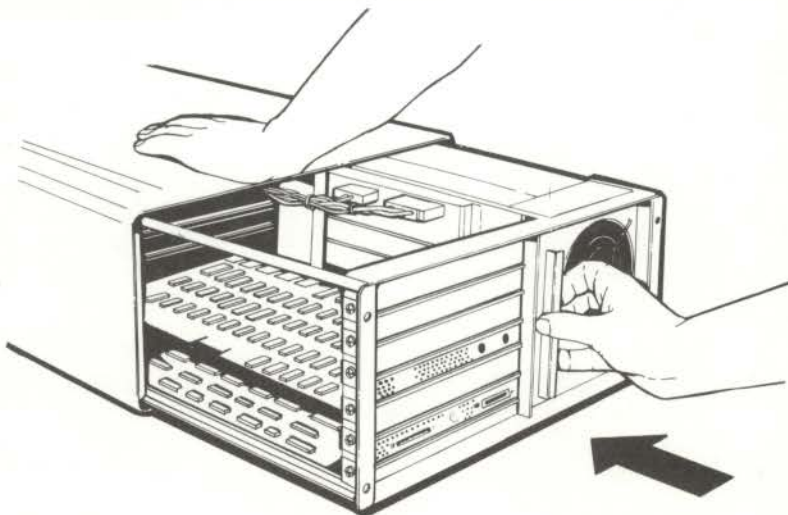


Figure 9-16. Replacing the Electronics Unit in Its Cover

NOTE:

If you have trouble sliding the electronics unit into the cover, pull it back out. Check to see that the cables are threaded so that they won't catch on the cover as you slide the chassis back in.

STEP 3: Push the electronics unit completely into its cover. The disk drives should fit snugly inside their housings. The four screw holes on the back panel should line up with the screw holes in the cover. Replace the four screws in the corners of the cover, as shown in Figure 9-17.

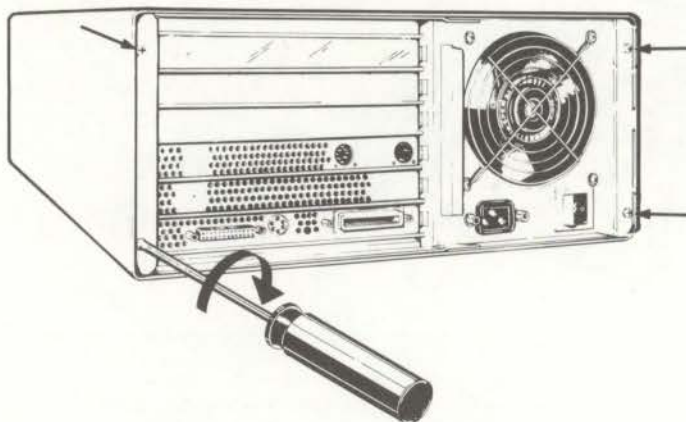


Figure 9-17. Reattaching the Cover of the Electronics Unit

9.2.8 Reconnecting Your System

This section presents basic instructions for reconnecting your system. If you require more specific instructions, read Sections 2.4 through 2.9.

Remember that your video card may appear in a different position from the one shown in the illustrations. Remember that no matter where this card is located, the process of connecting is exactly the same.

STEP 1: Position the electronics unit as shown in Figure 9-18. Plug the keyboard cable into its connector. Remember to align the connectors before you attempt to make this connection.

STEP 2: Reconnect both sets of video cables, as shown in Figure 9-18.

STEP 3: Make sure the power switch is set in the OFF position. Reconnect the power cord, as shown in Figure 9-18.

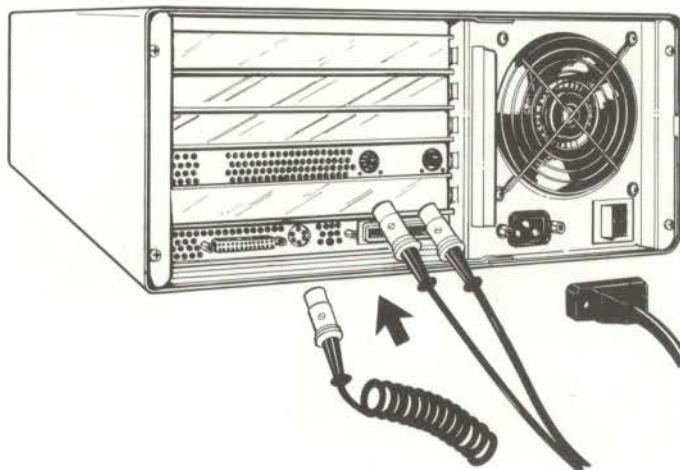


Figure 9-18. Reconnecting Your System

9.2.9 Testing Your Card

After installing a card, you should start your system as described in Section 3.1. Each time you start your system, the power-on diagnostics test all the system devices, including the card you've added. If the power-on diagnostics detect any problems with your card, an error message like the following will appear on the Start-up screen: *21 VIDEO CARD IN SLOT 3 DEFECTIVE. If this or a similar message appears, reinstall the card and restart your system. If you receive the same message on the Start-up screen, call the support personnel at the Wang Professional Computer Assistance Center at 1-800-343-1098 for an evaluation of the problem.

9.3 INSTALLING A WINCHESTER DISK DRIVE

Follow the procedures outlined in this section to add a Winchester disk drive to your system. The only tool you need to complete this installation is a #1 Phillips screwdriver. This process consists of the following steps:

- Removing the cover of the electronics unit
- Installing the Winchester Controller card
- Removing the disk drive mounting plate or Drive B
- Removing the ribbon cable from the System card
- Installing the Winchester drive
- Replacing the cover of the electronics unit
- Reconnecting your system
- Testing your Winchester drive

The first step (removing the cover of the electronics unit) is described in Section 9.2.1. The following sections describe the remainder of the process, beginning with installing the Winchester Controller card.

9.3.1 Installing the Winchester Controller Card

Follow the procedures in Sections 9.2.2 through 9.2.6 to insert the Winchester Controller card in the slot furthest from the System card. (Refer to Figure 9-3.) Once this card is installed, your unit should look like Figure 9-19.

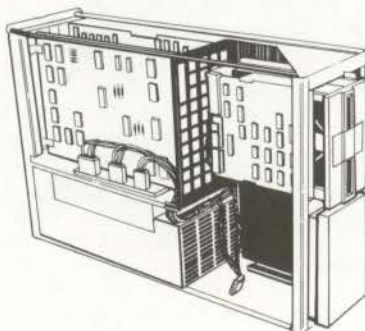


Figure 9-19. The Installed Winchester Controller Card

NOTE:

You must install the Winchester Controller card in the highest numbered slot so that the cables can be routed correctly from the drive to the connectors on the card. Improper routing of these cables can damage the cables and create problems when you try to replace the cover of the electronics unit.

9.3.2 Removing the Disk Drive Mounting Plate

Use the following procedure to remove the disk drive mounting plate.

STEP 1: Remove the screw holding the blank drive compartment cover and disk drive mounting plate to the chassis. Remove the drive compartment cover by squeezing its sides and pulling it from the chassis.

STEP 2: Slide the disk drive mounting plate completely out of the drive compartment. (Refer to Figure 9-20.) You will later attach this plate to the Winchester drive.

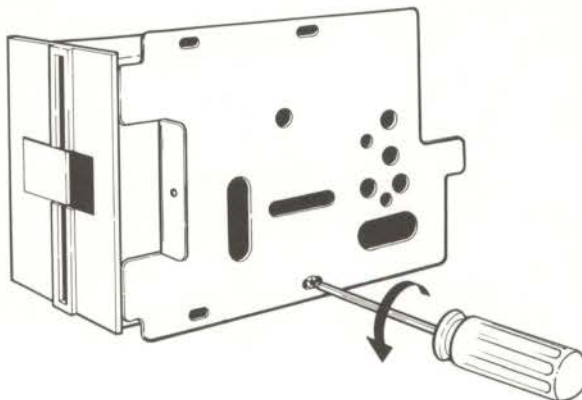


Figure 9-20. Removing the Disk Drive Mounting Plate

9.3.3 Removing Drive B

If you need to remove Drive B before installing your Winchester drive, use the following procedure.

STEP 1: Remove the screw holding Drive B in the chassis. Slide Drive B halfway out of the chassis.

STEP 2: Rock the ribbon cable off the back of Drive B, as shown in Figure 9-21.

STEP 3: Pull the 4-pinned power cable from the 4-pinned connector on Drive B, as shown in Figure 9-21. You will later attach this cable to the Winchester drive.

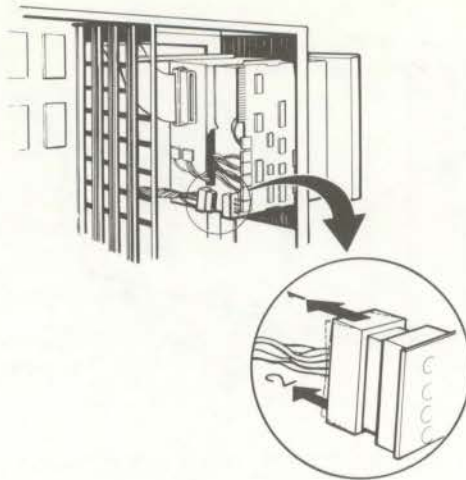


Figure 9-21. Removing the Power Cable

STEP 4: Pull Drive B completely out of the chassis.

STEP 5: Remove the screws holding the disk drive mounting plate to Drive B. You will later attach this plate to the Winchester drive.

NOTE:

Do not rest Drive B on your desk with its controller card facing down. You can inadvertently damage the controller by doing this.

9.3.4 Removing the Ribbon Cable from the System Card

STEP 1: Open the clips of the forwardmost connector on the System card. Remove the ribbon cable from the connector. (Refer to Figure 9-22.)

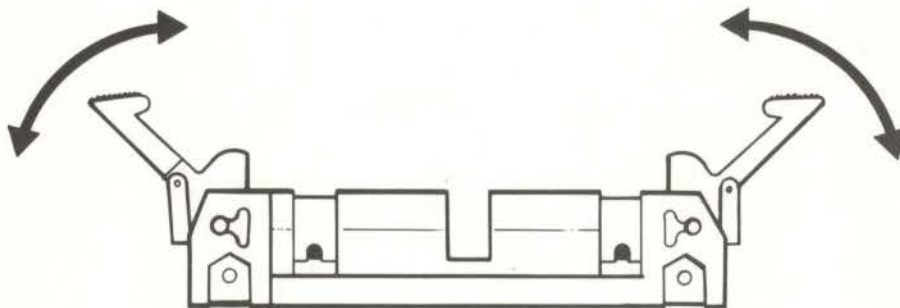


Figure 9-22. Removing the Cable from the Card

STEP 2: Place one hand on each end of the disconnected ribbon cable. Guide the cable back through the slot at the back of Drive A. Disengage the cable from the clips that secure it to the back of the drive compartment. Then pull the cable through the slot until it drops into the empty drive compartment. You will later attach this cable to the Winchester drive and the Winchester Controller card.

9.3.5 Installing the Winchester Disk Drive

STEP 1: Unpack the Winchester disk drive. Attach the mounting plate you removed in Section 9.3.2 or 9.3.3 tightly to the Winchester drive, using the screws provided on the inside of the drive compartment cover.

STEP 2: Slide the drive about halfway into the chassis, as shown in Figure 9-23.

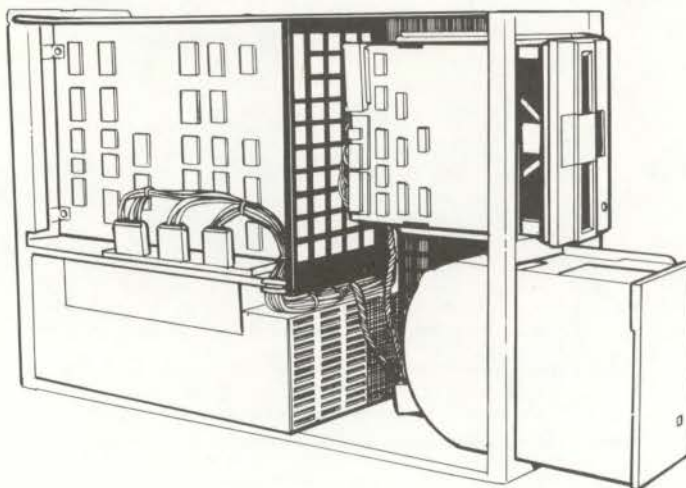


Figure 9-23. Inserting the Winchester Drive

STEP 3: Plug the 4-pinned power plug to the 4-pinned connector on the drive, as shown in Figure 9-24.

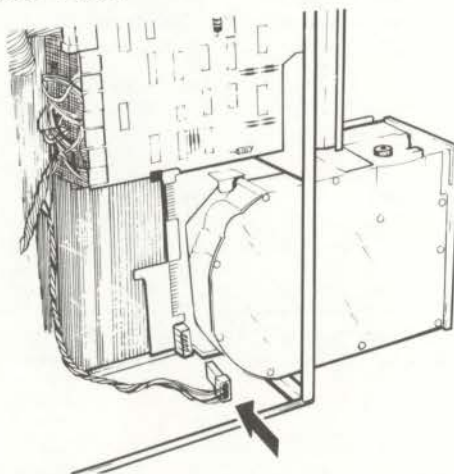


Figure 9-24. Connecting the Power Cable

STEP 4: Connect the ribbon cable you removed from the System card to the larger connector on the back of the drive, as shown in Figure 9-25. You cannot mount the connector incorrectly on the drive.

STEP 5: Connect the ribbon cable provided with the Winchester drive to the smaller set of connector pins on the drive. (Refer to Figure 9-25.)

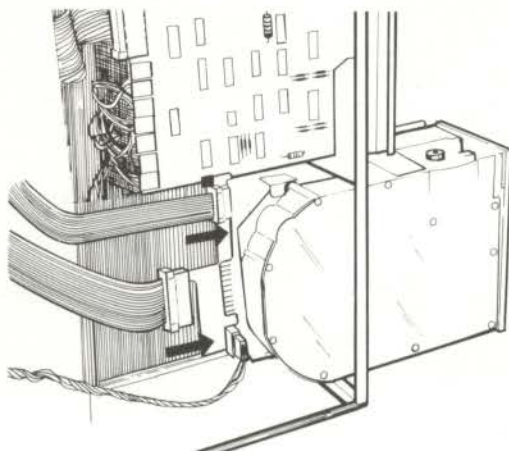


Figure 9-25. Connecting the Cables to the Drive

STEP 6: Feed the cables through the slot in the chassis behind the Winchester Controller card. Secure the cables in the clips on the back of the drive compartment. (Refer to Figure 9-26.)

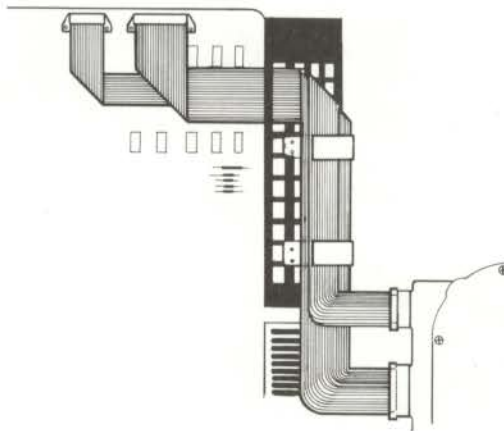


Figure 9-26. Threading the Winchester Cables

STEP 7: Connect the System card ribbon cable to the larger connector at the top of the Winchester Controller card, as shown in Figure 9-27.

STEP 8: Connect the Winchester ribbon cable to the smaller connector on the Winchester Controller card, as shown in Figure 9-27.

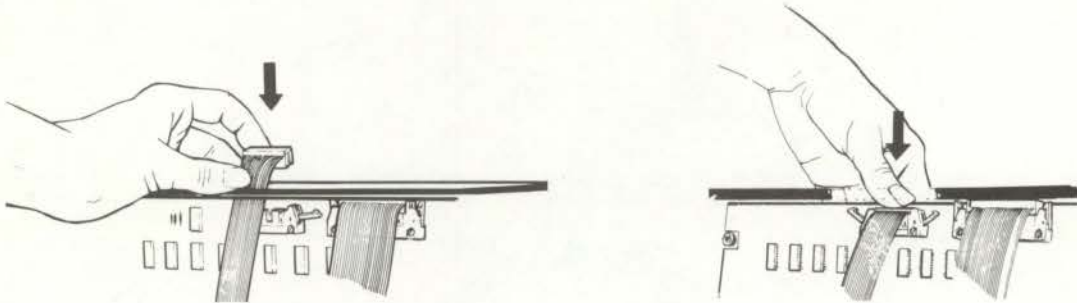


Figure 9-27. Winchester Controller Cable Connections

STEP 9: Slide the drive completely into the chassis. Fasten the drive to the chassis by replacing the screw in the mounting plate, as shown in Figure 9-28.

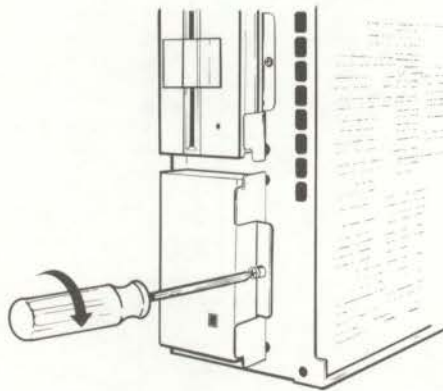


Figure 9-28. Securing the Winchester Drive to the Chassis

STEP 10: Make sure all cables are inside the chassis so that you can replace the cover of the electronics unit without damaging them.

9.3.6 Final Installation Steps

Replace the cover of the electronics unit. (Refer to the procedures and illustrations in Section 9.2.7.) Then reconnect your system as shown in Section 9.2.8.

The power-on diagnostics test both the Winchester Controller card and the Winchester drive each time you start your system. If the Winchester disk drive is operating correctly, your system follows the normal start-up sequence. However, if the power-on diagnostics detect a problem with the Winchester disk drive, the system displays the message, *22 WINCHESTER IN SLOT ## DEFECTIVE. The same message is displayed if the power-on diagnostics encounter a problem with the Winchester Controller card. If your system reports that Drive C is defective, you should reread Section 9.3, reinstall the Winchester disk drive, and retest your system to see if the problem was caused by an installation error. If Drive C remains defective after the retest, call the Wang Professional Computer Assistance Center at 1-800-343-1098.

9.4 INSTALLING A SECOND DISKETTE DRIVE

Installing a second diskette drive, or Drive B, consists of the following procedures:

1. Removing the cover of the electronics unit
2. Removing the disk drive mounting plate
3. Attaching the disk drive mounting plate to the drive
4. Installing Drive B
5. Replacing the cover of the electronics unit
6. Reconnecting your system
7. Testing Drive B

The first two procedures in the list -- removing the cover of the electronics unit and removing the disk drive mounting plate -- are covered in Sections 9.2.1 and 9.3.2, respectively. The remaining procedures in this list are described in the following sections.

9.4.1 Attaching the Disk Drive Mounting Plate

STEP 1: Remove the screws from the inside of the blank drive compartment cover.

STEP 2: Using these screws, attach the disk drive mounting plate firmly to the diskette drive. (Refer to Figure 9-29.)

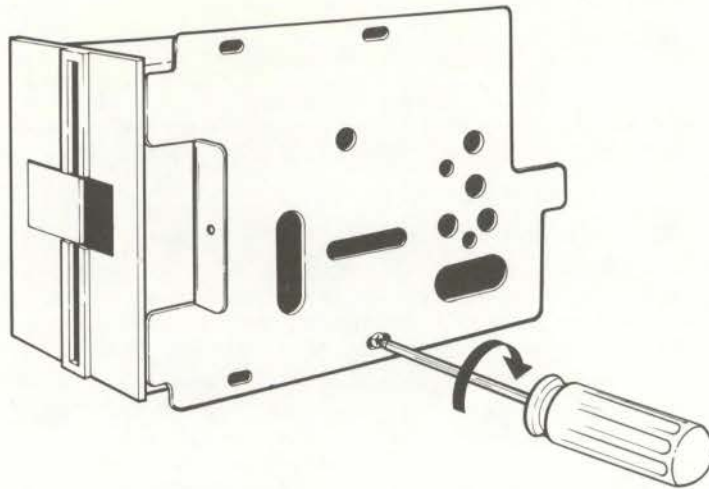


Figure 9-29. Installing the Drive Plate

9.4.2 Installing Drive B

STEP 1: Position the drive as shown in Figure 9-30.

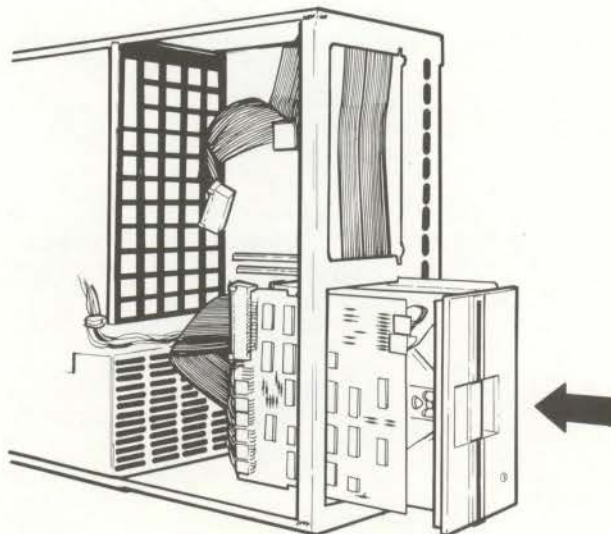


Figure 9-30. Inserting Drive B

STEP 2: Slide the drive halfway into the chassis, as shown in Figure 9-30. Be sure that the drive is sliding in the guides.

STEP 3: Remove the tie wrap from the 4-pinned power plug that extends from the power supply and connect it to the connector on the back of the diskette drive. (Refer to Figure 9-31.)

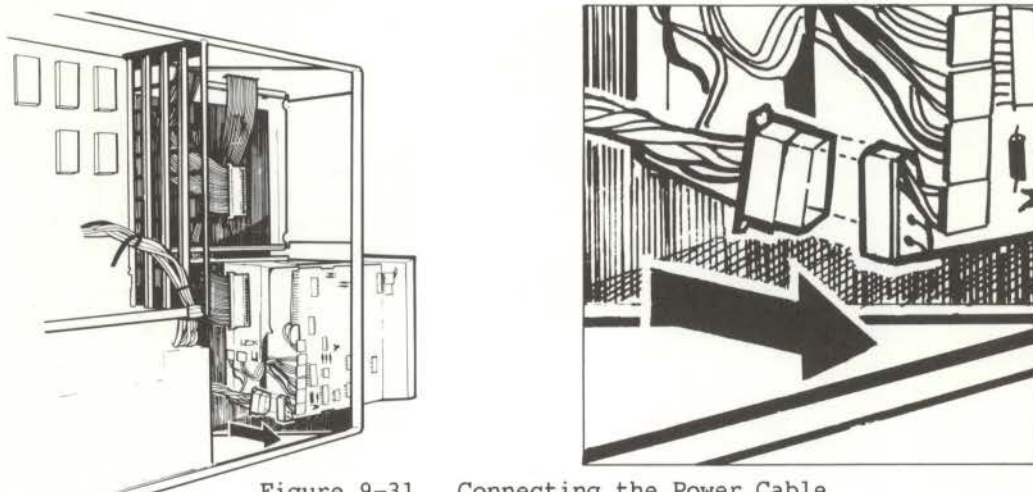


Figure 9-31. Connecting the Power Cable

STEP 4: Press the ribbon cable connector onto the keyed connector on the back of the diskette drive. Position the ribbon cable so it runs out of the connector as shown in Figure 9-32. The red stripe on the ribbon cable should face up.



Figure 9-32. Positioning the Ribbon Cable

STEP 6: Slide the drive the rest of the way into the chassis. Secure the drive to the chassis by tightening the screw shown in Figure 9-33. If the drive won't slide all the way into the chassis, check to see if the tab at the back of the drive is aligned with the slot at the back of the compartment, as shown in Figure 9-33.

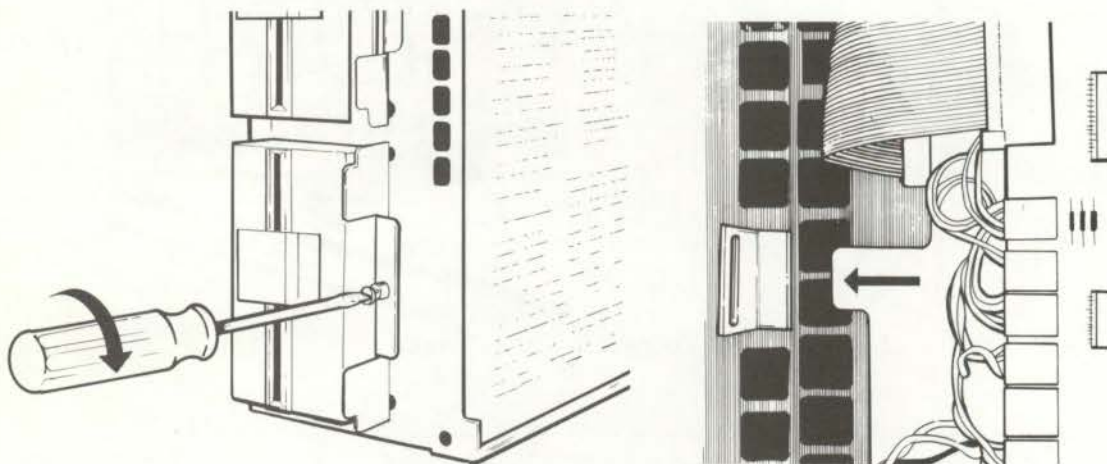


Figure 9-33. Installing Drive B

9.4.3 Final Installation Steps

Replace the cover of the electronics unit. (Refer to the procedures and illustrations in Section 9.2.7.) Then reconnect your system as shown in Section 9.2.8. After you reconnect your system, turn on the power switch. The power-on diagnostics will now run a test on Drive B each time you start your system. If Drive B is operating correctly, your system follows the normal start-up sequence. However, if the power-on diagnostics detect a problem with Drive B, the system displays the message: *22 DRIVE B DEFECTIVE. If this happens, you should reread Section 9.4, reinstall Drive B, and retest your system to see if the problem was caused by an error in installation. If Drive B remains nonfunctional after the retest, call the Wang Professional Computer Assistance Center at 1-800-343-1098.

9.5 INSTALLING THE ELECTRONICS UNIT ON THE DESK CLAMP

If you have purchased the optional desk clamp, you can use it to mount the electronics unit on the side of your desk. Before you install the desk clamp, you should use the following guidelines to determine whether or not you can safely install the clamp on your desk. Figure 9-34 and Table 9-1 outline the requirements that will ensure a safe installation and eliminate the possibility of unbalancing the desk.

CAUTION:

Do not use the desk clamp if any of your desk's measurements fail to meet the safety specifications shown in Figure 9-34. Do not use the desk clamp if your desktop either sits on a single pedestal base or rests upon, but is not secured to, its supports. Failure to observe these warnings will result in a potentially dangerous installation.

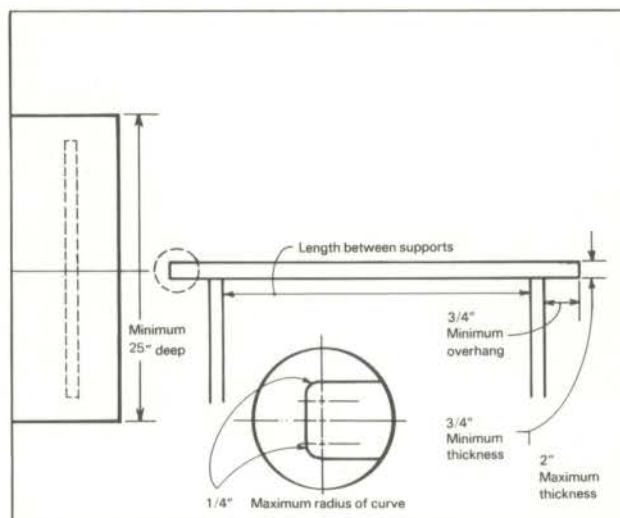


Figure 9-34. Desk Clamp Safety Specifications

As shown in Figure 9-34, your desktop must be between three-quarters of an inch and two inches thick in order for the desk clamp to work effectively. Second, there must be at least a 3/4-inch clearance between the edge of the desktop and the outer edge of any desk support or drawer underneath the desk in the immediate area of the desk clamp. Third, your desk must be at least 25 inches deep to enable you to position the electronics unit on the clamp while providing adequate ventilation.

In addition to the preceding specifications, your desk must conform to certain other minimum requirements in order to ensure its stability once the electronics unit is installed on the desk clamp. To determine this, you must measure the following:

- the length between the desk's supports (in inches)
- the overhang length (in inches)
- the approximate weight of the desk (in pounds)

Use Table 9-1 to interpret these measurements. The following procedure will help you to do this.

STEP 1: Find the Length Between Supports measurement on the chart that comes closest to yours.

STEP 2: Locate the approximate weight of your desk in the Weight column.

STEP 3: Read across the chart, and find the overhang that corresponds to the approximate weight of your desk.

STEP 4: Compare your measured overhang with the figure in the Maximum Overhang column. If the measured overhang is less than or equal to the overhang in the desk, your desk can support the electronics unit attached to the desk clamp.

Table 9-1. Desk Stability Relationships Chart

Length Between Supports (in.)	Weight (lb.)	Maximum Overhang (in.)	Length Between Supports (in.)	Weight (lb.)	Maximum Overhang (in.)
40"	56	.75	60"	37	.75
	75	2.2		50	2.2
	100	4.1		75	5.1
	125	6.1		100	8.0
	150	8.0		125	10.9
	175	9.9		150	13.8
	200	11.8		175	16.6
				200	19.5
45"	50	.8	65"	34	.75
	75	2.9		50	2.7
	100	5.1		75	5.8
	125	7.3		100	9.0
	150	9.4		125	12.1
	175	11.6		150	15.2
	200	13.8		175	18.3
50"	45	.8		200	21.5
	50	1.3		250	27.7
	75	3.7	70"	32	.8
	100	6.1		50	3.2
	125	8.5		75	6.5
	150	10.9		100	9.9
	175	13.3		125	13.3
	200	15.7		150	16.6
55"	41	.8		175	20.0
	50	1.7		200	23.4
	75	4.4		250	30.1
	100	7.0	75"	30	.8
	125	9.7		50	3.7
	150	12.3		75	7.3
	175	15.0		100	10.9
	200	17.6		125	14.5
				150	18.1
				175	21.7
				200	25.3
				250	32.5

For example, if your desk is 60 inches long between supports, has a 6-inch overhang, and weighs 100 pounds, you would use the following process to determine if your desk will support a Wang Professional Computer attached to the desk clamp.

STEP 1: Locate the 60-inch length in the Length Between Supports column of Table 9-1.

STEP 2: Locate the 100-pound entry in the Weight column.

STEP 3: Read across to the overhang figure -- in this case, 8 inches.

STEP 4: Compare your overhang measurement (6 inches) with the 8-inch figure in the chart. Since the measured figure is less than the figure in Table 9-1, your desk will support the electronics unit attached to the desk clamp.

If your desk meets the desk clamp safety requirements, you can use the following steps to attach the desk clamp to your desk.

CAUTION:

Turn the ON/OFF switch to the OFF position and unplug the power cord from the wall outlet before you begin to attach the electronics unit to the desk clamp.

STEP 1: Open the jaws of the clamp. Position the clamp where you want to install it on the desk. You should install the desk clamp/electronics unit assembly where you can comfortably open and close each of the diskette drive doors from your normal working position.

NOTE:

Position the clamp as far forward on your desk as possible to enable the interior fan to cool the electronics unit. Inadequate ventilation can lead to system failure.

STEP 2: Push the clamp up against the edge of your desk. Tighten the bolts by turning them counterclockwise. After you have tightened the jaws flush with the bottom of your desk, turn each bar at least two more revolutions or until it is completely secure.

STEP 3: Carefully pick up the electronics unit and position it so that the front is facing forward, as shown in Figure 9-35.

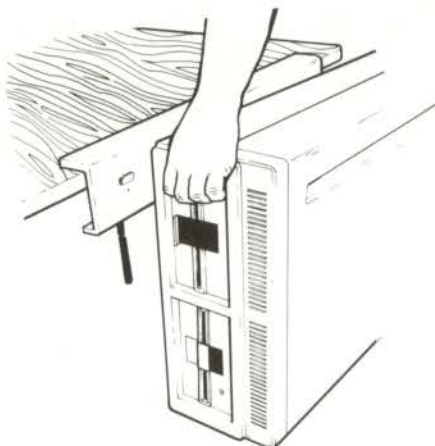


Figure 9-35. Positioning the Electronics Unit

STEP 4: Make sure that all of the cables are slack and untangled. Locate the cutouts on the side of your electronics unit. Refer to Figure 9-36.

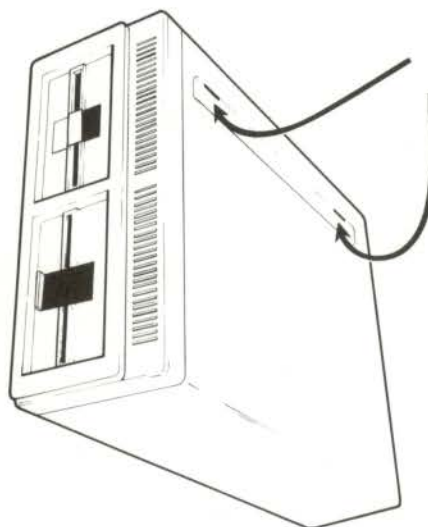


Figure 9-36. The Electronics Unit Cutouts

STEP 5: Attach the electronics unit to the desk clamp by fitting the cutouts on the electronics unit over the prongs on the clamp. Do not let go of the electronics unit until the top of the electronics unit is even with the top of the desk clamp. (Refer to Figure 9-37.)

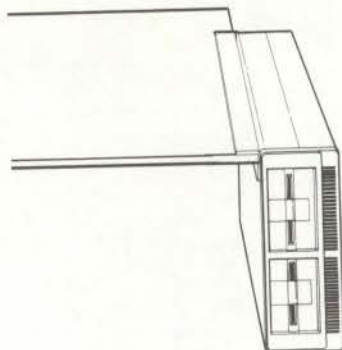


Figure 9-37. The Electronics Unit on the Desk Clamp

STEP 6: Reconnect the power cord to the wall outlet. Reposition your keyboard and monitor if necessary. Your computer system is now ready to use.

10

MONITOR OPTIONS

Connecting a Monitor
Assembling the Monitor Arm
Attaching the Assembled Monitor Arm



NOTICE

THE BOARD OF DIRECTORS
OF THE
CITY OF NEW YORK
HAS RESOLVED THAT
THE FOLLOWING
OFFICERS AND
MEMBERS OF THE
BOARD OF DIRECTORS
SHALL BE
ELECTED TO
OFFICE FOR
THE TERM OF
THREE YEARS
BEGINNING ON
JANUARY 1, 1991
AND ENDING ON
DECEMBER 31, 1993
AND THAT THE
SAYED OFFICERS
AND MEMBERS
SHALL BE
ELECTED BY
THE VOTERS
OF THE CITY OF
NEW YORK
ON NOVEMBER 3, 1991
AT THE
GENERAL ELECTIONS
FOR THE
CITY OF NEW YORK
AND THAT THE
SAYED OFFICERS
AND MEMBERS
SHALL BE
ELECTED BY
THE VOTERS
OF THE CITY OF
NEW YORK
ON NOVEMBER 3, 1991
AT THE
GENERAL ELECTIONS
FOR THE
CITY OF NEW YORK

CHAPTER 10 MONITOR OPTIONS

This chapter explains the procedure for connecting a monitor other than the Wang Monochrome Monitor to the industry-standard Monitor/Graphics card. (Directions for connecting the Wang Monochrome Monitor are included in Section 2.7.) If you are using the Wang Monochrome Monitor, you may also have purchased the optional monitor arm. This chapter also describes how to assemble the monitor arm, and tells you how to attach it to your desk.

10.1 CONNECTING A MONITOR

If you are using a monitor other than the Wang Monochrome Monitor with your Wang PC, you must first connect that monitor to the industry-standard Monitor/Graphics card. (Refer to Section 9.2.) Use the following set of instructions to connect your monitor to your system.

STEP 1: Connect your monitor's cable to the monitor cable connector on the back panel of the electronics unit, as shown in Figure 10-1.



Figure 10-1. Connecting an Industry-standard Monitor

STEP 2: Plug the monitor's power cord into an appropriately rated power outlet. Make sure the monitor is turned off.

STEP 3: Connect the electronics unit power cord to the back panel, as shown in Figure 10-2. Set the red power switch in the OFF position. Plug the free end of this cord into an appropriately rated power outlet.



Figure 10-2. Connecting the Power Cord

STEP 4: Turn on your monitor.

CAUTION:

Make sure that you have removed the shipping protector(s) from your diskette drive(s) before you turn on your system. (Refer to Section 2.3 for instructions on how to remove the shipping protector.)

STEP 5: Turn on the power switch at the back of your electronics unit.

At this point, your computer system is on. Each time you turn on the system, the computer runs its power-on diagnostic tests. While the tests are running, the five indicator lights on the keyboard light up. All of the indicator lights should go off after about 30 seconds, after which the Start-up screen should appear. (Refer to Figure 3-3.)

NOTE:

The Start-up screen should also include the messages ***41 START FAILED and 72 DRIVE A NOT READY. These messages do not indicate that your system is malfunctioning; they merely point out that you did not insert a diskette in Drive A. The computer can't do anything else until you load System Diskette I in Drive A and restart the system.

If any of the diagnostic indicator lights remains on for longer than 25 seconds, or if the system displays diagnostic messages other than ***41 START FAILED and 72 DRIVE A NOT READY on the screen, you probably have a problem with one of your components. If this is the case, you should turn to Appendix B, System Diagnostics, for instructions on what to do next.

If the Start-up screen does not appear after about 30 seconds, you should adjust the brightness and contrast knobs. If nothing appears on the screen after you do this, your monitor connections are probably loose. Check these connections and make any necessary adjustments.

After the Start-up screen appears, turn off your system. Before you do any work on your system, you should read Chapter 4. This chapter discusses some general concepts you should understand before you begin to work with diskettes. You should also read Section 3.1, which explains how to load System Diskette I and start the system.

Before you begin to use your system, set it up on your desk, following the guidelines specified in Section 2.9.

10.2 ASSEMBLING THE MONITOR ARM

If you have purchased the optional monitor arm, you can attach the Wang Monochrome Monitor to it. Note, however, that this arm is intended for use with the Wang Monochrome Monitor only. Follow the steps below to assemble the monitor arm.

STEP 1: Make sure that your desk meets the critical safety specifications shown in Figure 10-3.

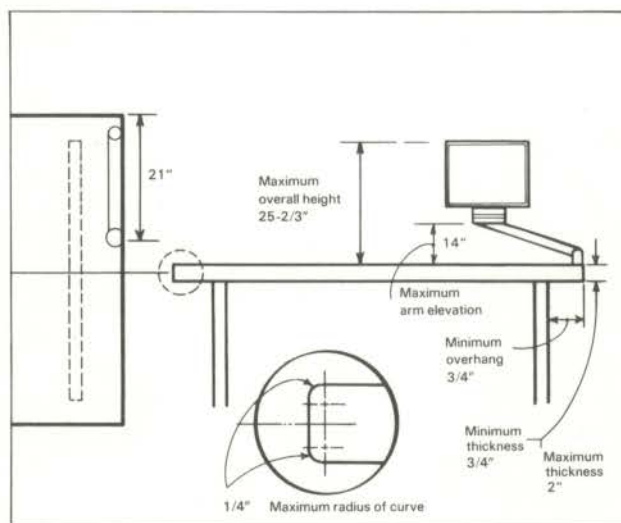


Figure 10-3. Monitor Arm Safety Specifications

In summary, the safety specifications in Figure 10-3 say the following. First, your desktop must be at least $\frac{3}{4}$ of an inch thick, but no more than 2 inches thick in order for the clamp to work effectively. Second, there must be at least a $\frac{3}{4}$ -inch clearance between the edge of the desktop and the outer edge of any desk support or drawer underneath the desk in the immediate area of the monitor arm. Third, there must be at least a 21-inch radius between the point at which you intend to attach the clamp and any walls or objects that may interfere with the movement of the monitor arm. Fourth, you should check to be sure that there are no objects (such as bookshelves or lamps) placed less than 26 inches above the desk, since they will also inhibit the movement of the monitor arm. Finally, if your desktop has rounded edges, you can't use the monitor arm unless the radius of arc on each edge is less than $\frac{1}{4}$ inch.

WARNING:

If any of your desk's measurements fails to meet the safety specifications shown in Figure 10-3, do not attach the monitor arm to your desk. Also, if your desktop either sits on a single pedestal base or rests upon, but is not directly attached to, its supports, you should not use the monitor arm. Failure to observe this warning may result in a potentially dangerous installation in which the monitor may fall off your desk and be damaged.

STEP 2: Make sure that your computer is turned off.

STEP 3: Disconnect the monitor cable from the back panel of the electronics unit by pulling out the top connector. Then pull out the bottom connector. It is not necessary to disconnect the monitor cable from the monitor during this procedure.

STEP 4: Turn the Wang monitor upside-down so that the pedestal base is facing upward, as shown in Figure 10-4.

STEP 5: Using a flat-blade screwdriver, a dime, or other flat object, pry out the arm's protective cover, as shown in Figure 10-4.

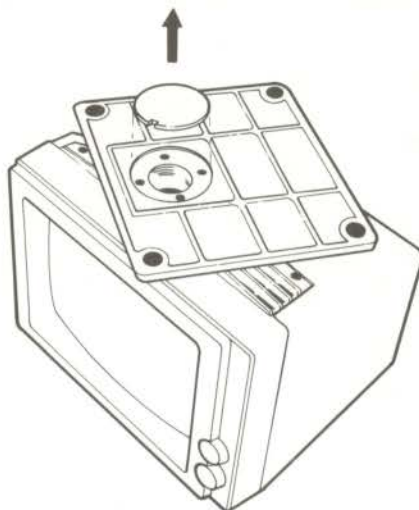


Figure 10-4. Preparing to Attach the Monitor Arm

STEP 6: Locate the four screws that hold the base to the monitor, as shown in Figure 10-5a. Use a #1 point-size Phillips screwdriver to unscrew each of these screws. Be sure to save these screws, since they also fasten the arm to the monitor.

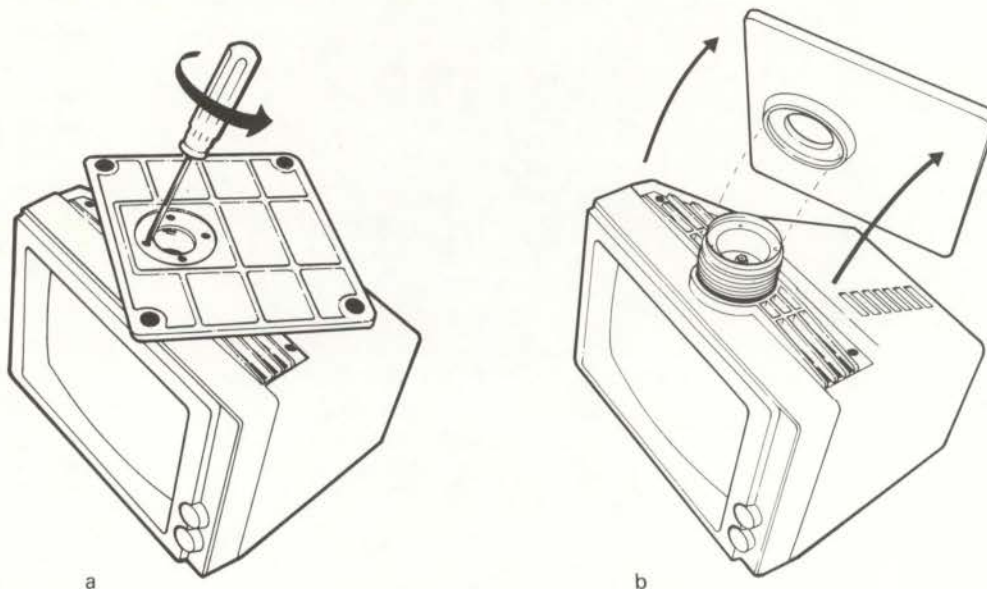


Figure 10-5. Removing the Pedestal Base

STEP 7: Gently lift the pedestal base off the monitor, as shown in Figure 10-5b.

STEP 8: Pinch the rubber bellows so you can remove it from the monitor as shown in Figure 10-6. You will be putting the rubber bellows back in place after you remove the movement restrictor band in Step 10.

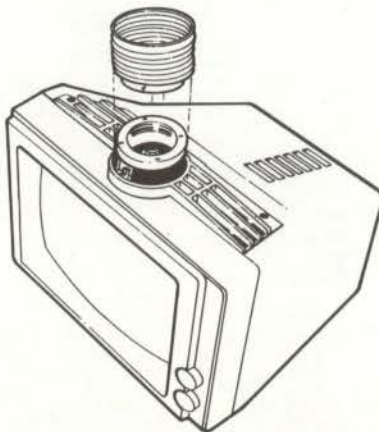


Figure 10-6. Removing the Bellows

STEP 9: Find the movement restrictor band and unsnap it, as shown in Figure 10-7. This band restricts the right and left rotation of the monitor when it is on its pedestal base. The movement restrictor band is not used in the monitor arm assembly. As a result, you can freely turn the monitor to the left or right when it's on the monitor arm.

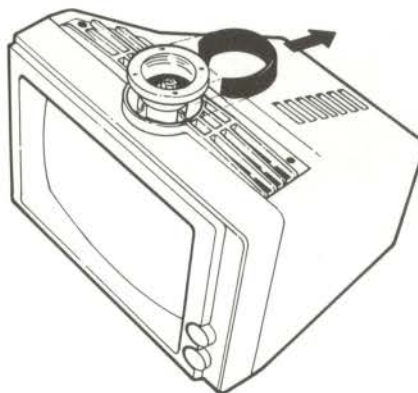


Figure 10-7. Removing the Movement Restrictor

NOTE:

Keep the movement restrictor band in case you decide to put the monitor back on its pedestal base.

STEP 10: Replace the rubber bellows, as shown in Figure 10-8.

STEP 11: Place the monitor arm on the monitor as shown in Figure 10-8. The gray plastic cable guide cover should be facing you.

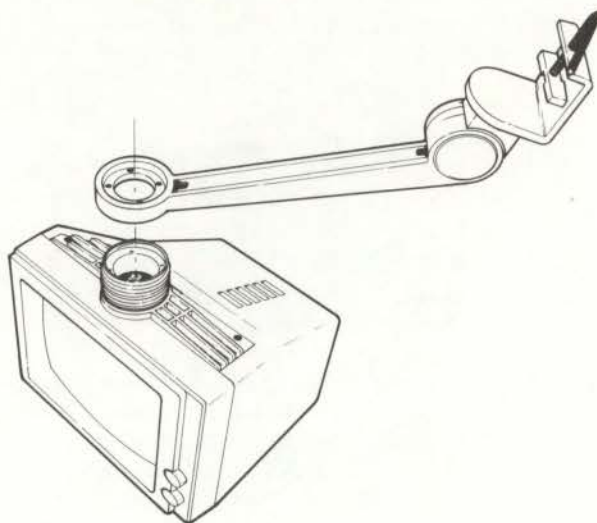


Figure 10-8. Positioning the Monitor Arm

STEP 12: Line up the screw holes in the arm with those on the monitor. You will probably need someone to support the arm as you begin to attach it to the monitor. Refer to Figure 10-9.

STEP 13: Use the four screws you removed from the base to secure the arm to the monitor. Do not let go of the monitor arm until after you screw down the third screw.

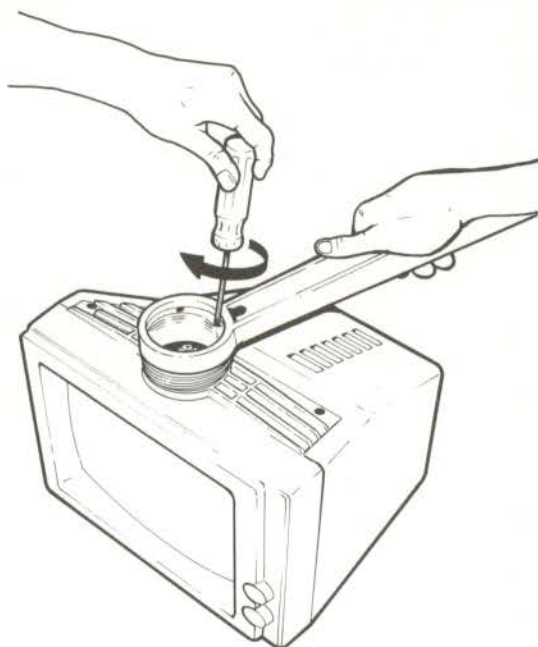


Figure 10-9. Attaching the Arm

STEP 14: Snap the round protective cover onto the bellows, as shown in Figure 10-10.

STEP 15: Remove the cable guide from the arm. Pry out the cable guide with your screwdriver as shown in Figure 10-10a.

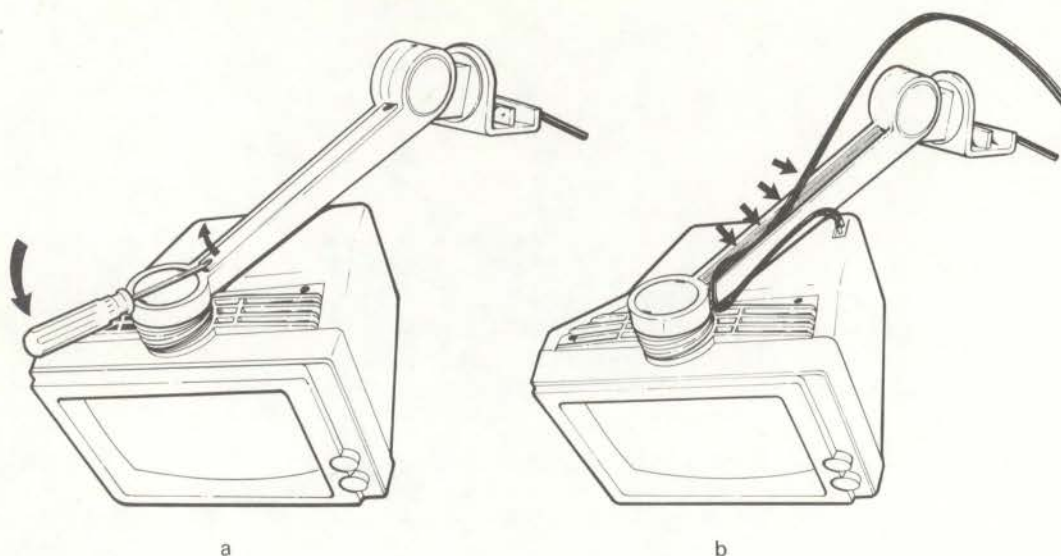


Figure 10-10. Threading the Monitor Cable

STEP 16: Thread the monitor cable over the far end of the arm and into the cable channel, as shown in Figure 10-10. Leave some slack in the cable between the monitor's cable connectors and the bellows end of the cable channel. Place the monitor cable in the arm as shown in Figure 10-11 and snap the cable guide back in place. Once you complete this process, you have finished assembling the monitor arm.

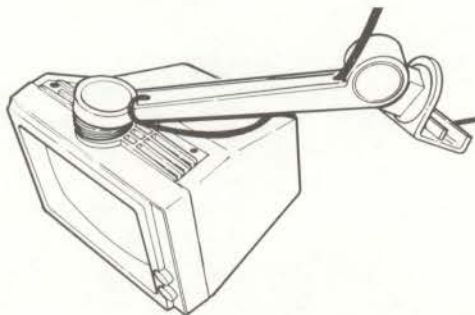


Figure 10-11. The Assembled Monitor Arm

10.3 ATTACHING THE ASSEMBLED MONITOR ARM

After you attach the monitor arm to your desk, you can adjust the height of the monitor, tilt the monitor up or down, or swing the monitor to the left or right. Although the monitor arm is preset to swing left or right through an arc of 180 degrees, you can either restrict the arm's movement to a 90-degree arc or increase it to a full 360 degrees. If you want to change this setting, you should do so before you clamp the monitor arm onto your desk. Figure 10-12a shows where the arc restrictors are located inside the monitor arm. Figure 10-12b illustrates how you change the arc setting.

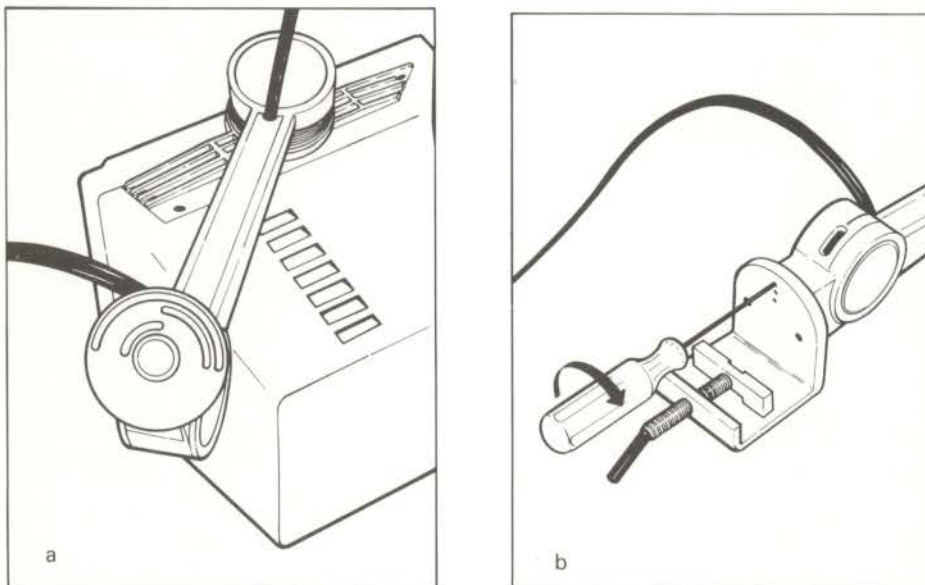


Figure 10-12. The Arc Restrictors

Figure 10-13 shows the range of motion that each of the arc settings creates for the most common configurations of the monitor arm on a desk. The black dot to the left of the setting indicates the position of the set screw.

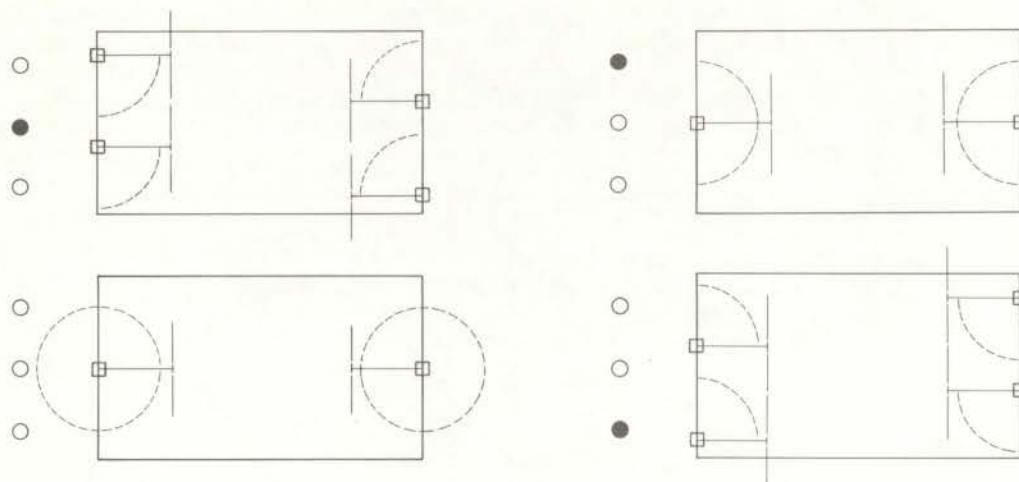


Figure 10-13. Monitor Arm Arc Settings

If you want your monitor to move in a 180-degree arc, leave the set screw in the outermost arc (the hole the screwdriver is in in Figure 10-12b). If you want the monitor to swing only 90 degrees, move the set screw to either the center or innermost arc setting. Use Figure 10-13 to determine which setting is most suitable to your needs.

Once you have selected the setting you want, insert the 3/32-inch Allen wrench supplied with the monitor arm into the 180-degree arc restrictor hole. Remove the set screw by placing the Allen wrench in the outermost arc and turning it counterclockwise until the set screw is completely out of the arm. Place the set screw in the arc setting you've selected and turn the wrench clockwise until the screw is completely tightened in the new setting. To allow the monitor to swing in a 360-degree arc, you need only remove the set screw.

You are now ready to install the monitor arm on your desk. The following procedure tells you how to do this.

STEP 1: To avoid the possibility of someone tripping over the monitor cable, tape the cable to the arm, as shown in Figure 10-14a.

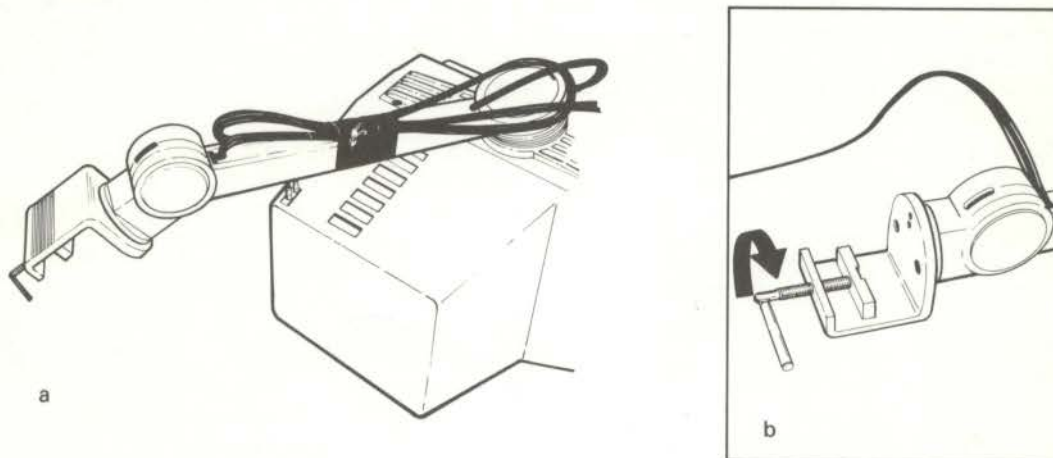


Figure 10-14. Taping the Monitor Cable

STEP 2: Before you pick up the assembled arm, make sure that the clamp is opened wide enough to fit over the edge of your desk. (Refer to Figure 10-14b.) Turn the bar clockwise to open the clamp.

STEP 3: Have someone pick up the monitor arm assembly, supporting it from underneath as shown in Figure 10-15.

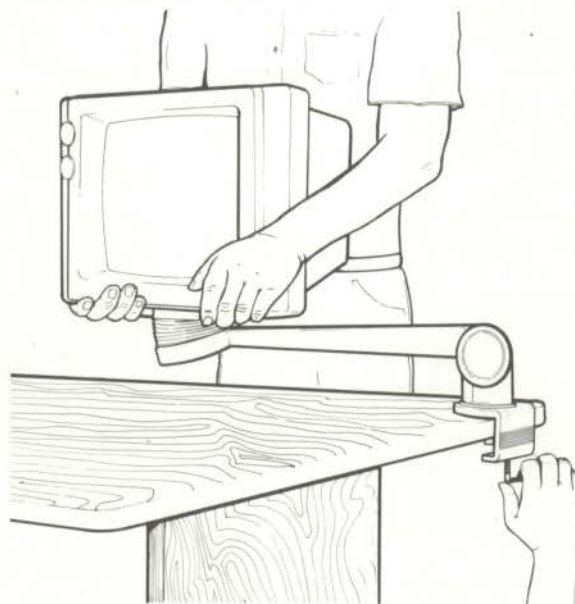


Figure 10-15. Installing the Monitor Arm

STEP 4: Position the clamp in the desired location on your desk.

STEP 5: Tighten the clamp by turning it counterclockwise, as shown in Figure 10-16. Make sure that the back edge of the clamp is flush against the edge of your desk. When the bottom jaw of the clamp is tight against the bottom of your desk, continue to turn the tightening bar for at least two more revolutions, or until it is completely secure.

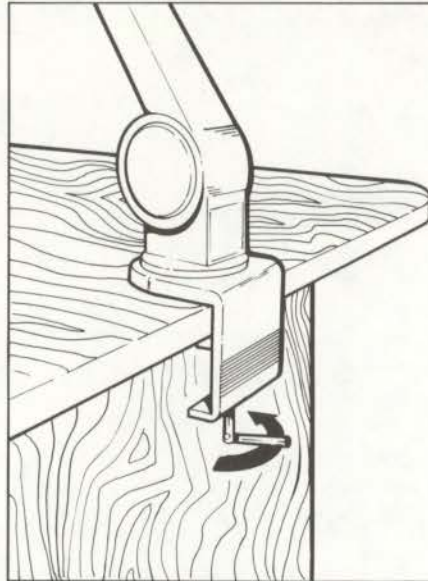


Figure 10-16. Tightening the Monitor Arm Clamp

STEP 6: Reconnect the two connectors on the monitor cable to the electronics unit. (Refer to Figure 10-17.)

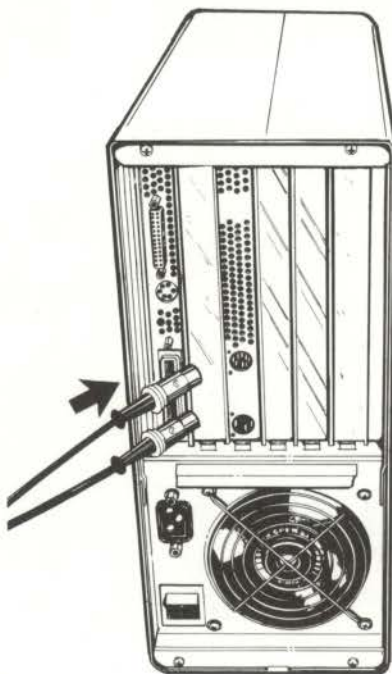
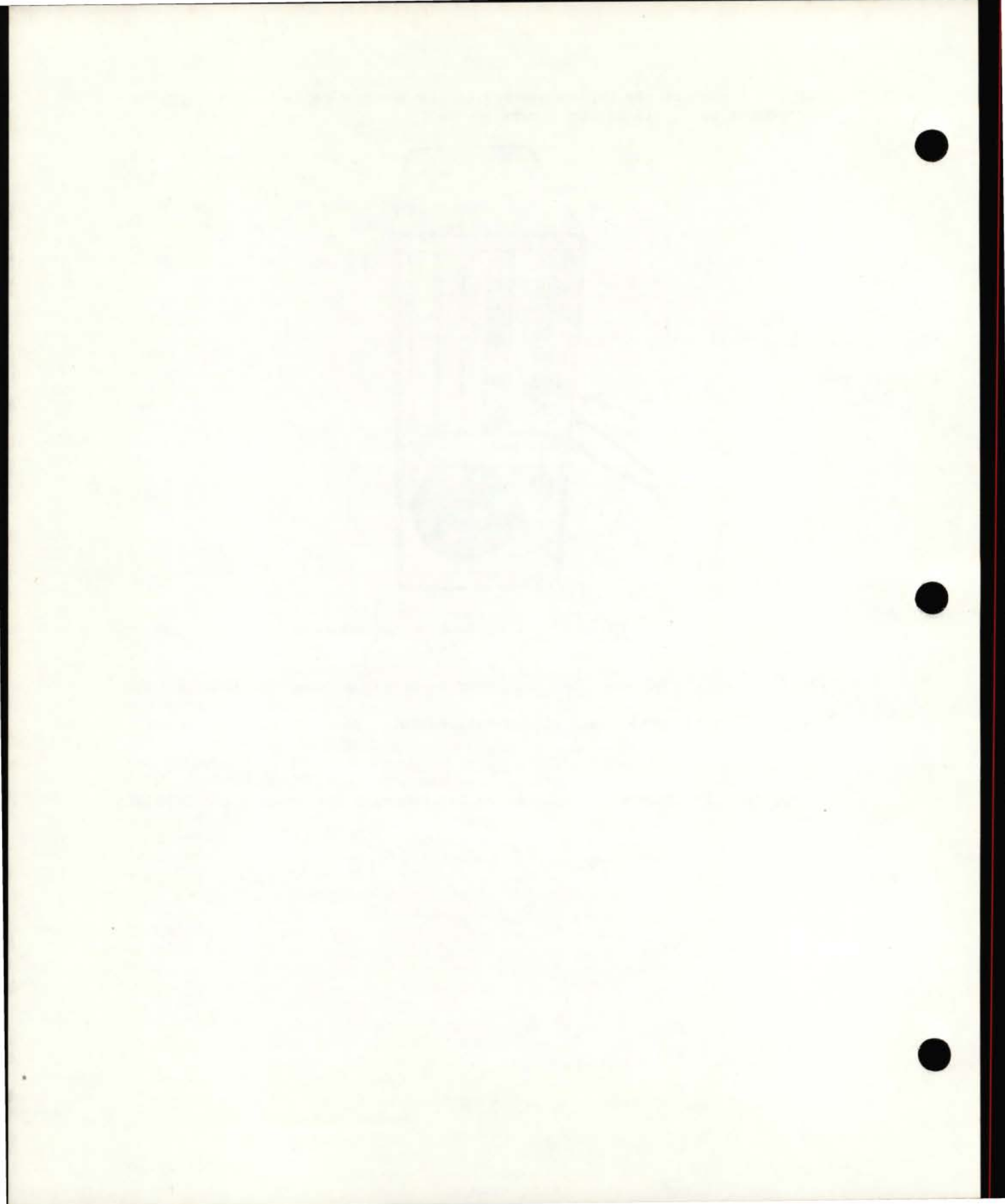


Figure 10-17. Reconnecting the Monitor

STEP 7: Check to be sure that the power switch is in the OFF position.

STEP 8: Plug the power cord into a wall outlet. Your monitor arm is now installed.

Appendix F describes the procedure for removing the arm and reassembling the base.



APPENDICES

APPENDIX A COMMON PROBLEMS

A.1 INTRODUCTION

Problems are not always what they seem. Many of the problems that arise when you first begin to use a computer may appear to be serious but are actually easy to diagnose and correct. This appendix describes situations that may develop as you learn to use your Wang Professional Computer. Each one is described and then explained. A solution is presented for each problem and, if appropriate, references are given to sections within this manual where a particular procedure is discussed in more detail.

Each of the problems described in this chapter is the result of user error or misunderstanding. If you encounter a problem, look through this list. You should be able to match your problem to one of those described in this appendix and correct your mistake. If the problem you've encountered isn't described in this appendix, turn to Appendix B, System Diagnostics, to see what you should do next. Appendix B lists the procedures you should follow to contact the Wang Professional Computer Assistance Center about a problem. Appendix B also describes how you can use the System Diagnostics diskette to detect hardware problems in your system.

A.2 STARTING THE SYSTEM

The Problem	Possible Causes and Solutions
You turn on the Wang PC, the power-on diagnostics run, and the Start-up screen appears. The following message appears on the Start-up Screen:	
***41 START FAILED 72 DRIVE A NOT READY	The diskette drive door is closed but there is no diskette in the drive. Insert System Diskette I in Drive A and restart the system as described in Section 3.1. You inserted the diskette incorrectly. Remove the diskette, make sure that the arrows are pointing in the right direction, and reinsert the diskette. Restart your system.
***41 START FAILED 73 DRIVE A FAILURE	There is an unformatted and uninitialized diskette in the drive. Take out the diskette and format it. Refer to Section 3.4 for details on how to format a diskette.
***40 NO AUTO-START DEVICE	Both diskette drive doors are open. Insert System Diskette I in Drive A, close the door, and restart the system.
***41 START FAILED 71 DRIVE A NO WANG START TRACK	Check to make sure that System Diskette I is in Drive A. Remove System Diskette I and reinsert it, making sure that the arrows are oriented correctly.
You start your system with System Diskette I in Drive A. The drive indicator light comes on, the drive makes a whirring sound, but nothing appears on the screen.	The Wang Monochrome Monitor is not connected or is connected improperly. See Section 2.7 for details on how to connect the Wang Monochrome Monitor.

A.3 USING DISK DRIVES AND DISKETTES

The Problem	Possible Causes and Solutions
After starting your system and inserting a diskette, you get the following message: ***45 DISK READ ERROR - RESTART	The diskette is inserted incorrectly. Reinsert the diskette, making sure that the arrows are oriented correctly.
You want Drive B to be the default drive.	Select the DOS Command Processor from the Main System Menu. At the DOS prompt "A:" type the drive designation "B:". Drive B is now the default drive. Drive B is the default drive if you start or restart your system by loading System Diskette I in Drive B and leave Drive A's door open.
You insert a diskette correctly but it doesn't load successfully.	The diskette may be either unformatted or damaged. Insert a formatted diskette. Refer to Section 3.4 for details.
You want to use a diskette for the first time.	Format the diskette. Refer to Section 3.4 for instructions on how to format a diskette.
You try to use a file on a diskette but you're unsuccessful.	The diskette is write-protected. Remove the write-protect tab from the diskette and try again.
You can't find a directory on a diskette.	Make sure that you are specifying the directory correctly. If you still can't find the directory, the diskette has not been formatted. Format the diskette as described in Section 3.4.

The Problem	Possible Causes and Solutions
You try to use a file but you get a "File not found" message.	The file you're looking for isn't on the diskette in the current drive. Check the directory to confirm this. If the file appears in the directory, retype the file name. You may have used the wrong syntax or an incorrect spelling the first time you entered the command.
You try to save a file on a diskette but you get a "Diskette full" message.	There isn't enough room left on the diskette in the current drive. Use a different diskette to store file.

A.4 USING THE MENUS

The Problem	Possible Causes and Solutions
You want to select a menu option.	Press the space bar to move the acceptance block to the desired menu selection. Press EXEC. NOTE: On many Wang PC menus, you can move the acceptance block by typing the first letter of the name of the item you wish to select.
You want to get out of the system menus and into the DOS Command Processor.	Select the DOS Command Processor menu option from the Main System Menu.
You want to move out of BASIC and back to the system menus.	Type the word SYSTEM, make sure that System Diskette I is in the default drive, and press RETURN.
You want to move from the Command Processor back to the system menus.	Type the word EXIT and then press RETURN.
You make a menu selection but nothing happens.	The diskette in the default drive does not include the software for your selection. Check the disk directory. Locate the diskette with the appropriate software and insert it in the default drive. Make your menu selection again.

A.5 RESTARTING YOUR SYSTEM

The Problem	Possible Causes and Solutions
You try the restart key sequence but nothing happens.	You may have typed the restart key sequence incorrectly. Press 2ND + COMMAND simultaneously, then release that key combination and press CANCEL. If this does not work, turn the power switch off, wait five seconds, and turn it on again.

A.6 USING THE KEYBOARD

The Problem	Possible Causes and Solutions
You're not sure when you can begin to type.	You can type whenever you see a prompt followed by a cursor (a blinking bar). In DOS, the prompt is a capital A followed by a colon (A:); the cursor appears next to the prompt. The BASIC prompt is the word Ok; the cursor appears underneath the prompt. In a utility display, the cursor appears next to the first prompt when the display appears.
Nothing happens when you press the keys.	The keyboard cable is unplugged or partially unplugged. Plug the end of the keyboard cable into the connector on the back of the electronics unit. Section 2.6 shows the procedure for connecting the keyboard cable.
You want the computer to accept what you've typed.	In the DOS Command Processor or in BASIC, press RETURN. In a utility display, press EXEC after you respond to all prompts in the display.
You want to make a key repeat.	Press the key. It will begin to repeat if you hold it down for more than one-third of a second.

The Problem	Possible Causes and Solutions
The Word Processing special function keys or Multiplan special function keys don't work.	The Word Processing special function keys only work when the Word Processing software is loaded into the system. When you select Word Processing or Multiplan from the Applications Menu, a diskette with the application should be loaded in the default drive.
You can't get CONTROL to work.	You're not using the key correctly. First, press CONTROL. Then press the combination code key while continuing to hold down CONTROL. This process is the same one you use to type uppercase letters on a typewriter.

A.7 USING YOUR MONITOR

The Problem	Possible Causes and Solutions
You can't get a picture.	The contrast knob is turned down. Slowly turn this knob to adjust the contrast. If turning the contrast knob doesn't work, try turning the brightness knob. The monitor is not plugged in. Check your connections. Refer to Section 2.7 for details on connecting the Wang Monochrome Monitor.
Characters are too light or too bright	The brightness and/or contrast knobs are set incorrectly. Slowly turn these knobs until the characters are easy to read on a solid background.
Your monitor doesn't show color.	Either your video card or the monitor doesn't have color capability. The application you're using doesn't have any color displays.
Your monitor doesn't show graphics.	Either your video card or the application you're using doesn't have graphics capability.

A.8 PRINTING

The Problem	Possible Causes and Solutions
Nothing prints.	Your printer may not be selected. Select the printer. Check the printer reference manual for details. The printer cable is not securely connected. The printer's power switch isn't turned on.
Pages not starting to print and/or not stopping in the right place.	Adjust top of form. Your printer reference manual explains how to adjust the top of form.
You can't figure out how to get your system to print.	Consult your printer reference manual. Verify that a device driver is installed in the operating system. (Refer to Appendix I.)
The paper rips every time you tear a page off the printer.	The paper is jammed or there is no line feed. Check your printer reference manual for details.
The print quality is poor.	Replace the ribbon or adjust the forms thickness. Refer to your printer reference manual for instructions.

A.9 FURTHER PROBLEMS

If you are having a problem with your system that you haven't been able to solve by using the procedures suggested in this chapter, turn to Appendix B, System Diagnostics, to decide what you should do next.

APPENDIX B SYSTEM DIAGNOSTICS

B.1 INTRODUCTION

This chapter explains the functions of the two types of diagnostic tests (power-on diagnostics and System Diagnostics) that run on the Wang Professional Computer. The chapter tells you what you should do if the power-on diagnostics report that your system contains a defective device. The chapter also contains a description of how you should use the System Diagnostics diskette.

Most problems that will arise as you begin to use your system are explained in Appendix A, Common Problems. If you need help on a specific procedure, consult the appropriate chapter in this manual. If you need immediate assistance in diagnosing a problem with your system, you can call the Wang Professional Computer Assistance Center at 1-800-343-1098. The Professional Computer Assistance Center is located in Lowell, Massachusetts, and supports a toll-free phone line from 8:30 am to 5:30 pm, Monday through Friday, Eastern time. By calling this number you can receive answers to questions about any Wang-provided application, utility, language, or operating system. You can use the toll-free number from anywhere within the United States, Puerto Rico, or the Virgin Islands, with the following exceptions. If you're located in Massachusetts, Alaska, or Hawaii, you should call 617-459-5000 and ask to be connected to the Wang Professional Computer Assistance Center.

B.2 THE POWER-ON DIAGNOSTICS

You may have a serious problem with your system if an alarm sounds while your system runs the power-on diagnostics and any single LED or combination of LEDs remains lit for more than 30 seconds. If this happens, restart your system and see if the problem recurs. If it does, you should call the Wang Professional Computer Assistance Center.

NOTE:

If you have an On-site Maintenance Contract covering your system, you should contact your customer engineer at the number provided on your copy of the service agreement contract.

The personnel at the Assistance Center will help you determine which component is causing the problem. Once the problem has been identified, you will be told to send the defective component to one of the three Wang Field Service Centers in Lawrence, MA, Atlanta, GA, or Marina Del Ray, CA.

If the power-on diagnostics run successfully but the Start-up screen reports that there are one or more defective devices in your system (as in the sample shown in Figure B-1), you should also call the Wang Professional Computer Assistance Center. The personnel at the Assistance Center may request that you use the System Diagnostics diskette to isolate the problem. Though in many cases you can continue to use a system with a defective device, at some point you will have to send the defective component to a service center to be repaired.

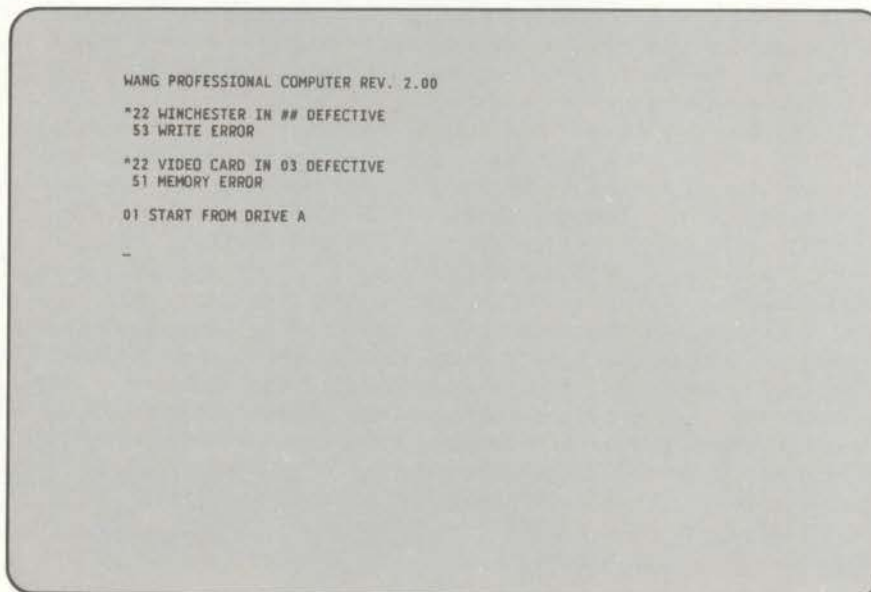


Figure B-1. Sample Defective Device Start-up Screen

B.3 USING THE SYSTEM DIAGNOSTICS DISKETTE

The System Diagnostics diskette is a piece of software that contains a wide range of diagnostic tests that can determine where your system is malfunctioning.

The Wang PC Assistance Center may ask you to use the System Diagnostics diskette to identify a problem indicated by an unsuccessful power-on diagnostics test. The personnel at the Assistance Center may also ask you to run the System Diagnostics to pinpoint a defective device reported on the Start-up screen. The following steps outline the procedure for using the System Diagnostics diskette.

STEP 1: Insert the System Diagnostics diskette in Drive A and power on your system. Read the System Diagnostics Disclaimer screen. (Refer to Figure B-2.)

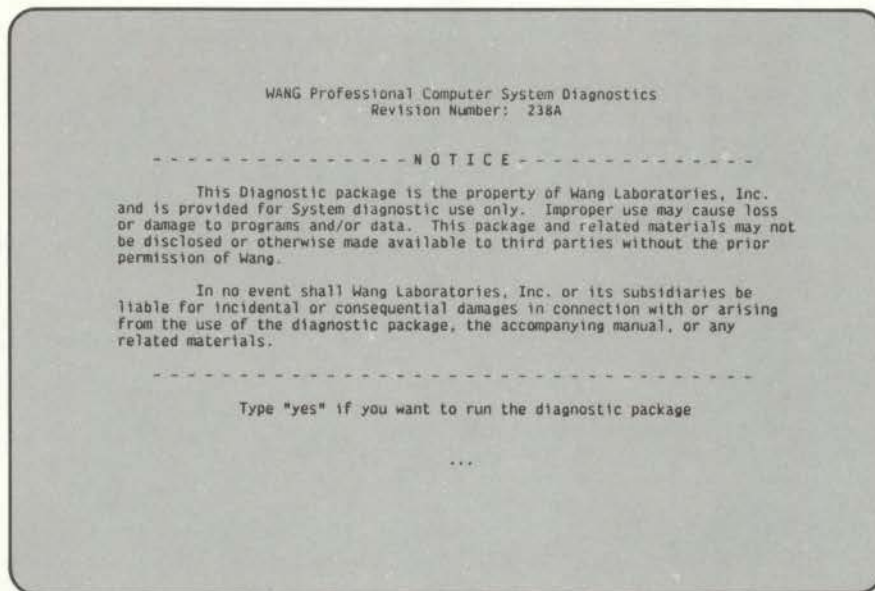


Figure B-2. The System Diagnostics Disclaimer Screen

STEP 2: Type the word yes to start the System Diagnostic tests. A System Diagnostics Menu similar to the one shown in Figure B-3 appears on the screen.

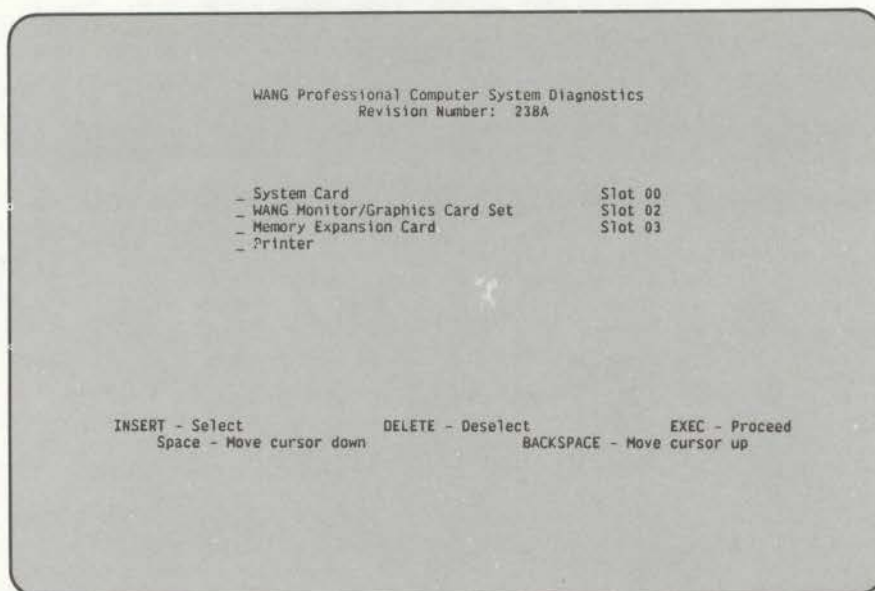


Figure B-3. Sample System Diagnostics Menu

NOTE:

If you decide not to run the System Diagnostic tests, remove the System Diagnostics diskette from Drive A. You can then reinsert System Diskette I, turn the power switch off and then on again, and restart your system.

This menu is customized for each Wang Professional Computer system. The menu displays the name of each card installed in your system and the expansion slot in which each one is located. This menu lists only those devices that your PC contains. All selections on the System Diagnostics menu with an acceptance block next to them are preselected tests. These tests run automatically after you press EXEC. The System card tests and the video card tests are preselected tests for all Wang PC configurations. If you have a loop back connector connected to the serial and parallel ports on the System card when you start your system, the menu also includes selections for parallel and/or serial port diagnostics. (Refer to the discussion of the Remote Communications Card test in Section B.3.2 for information on loop back connectors.) If your system includes other cards and/or a printer, the menu may also indicate that the tests for these devices are preselected.

If you want to deselect one of the preselected tests, use the space bar to move the cursor next to the item you want to deselect and press DELETE. Similarly, if you want to test items on the System Diagnostics menu that aren't preselected, move the cursor next to each item and press INSERT. An acceptance block appears next to each item you select.

NOTE:

Some diagnostic tests require special equipment or can only be run under certain conditions. Be sure to read Section B.3.2 before you run tests other than the System Card test.

STEP 3: Press EXEC to start the testing. While each test runs, a series of displays appear on your screen that report information to you about the status of the testing. Figure B-4 is a sample test screen.

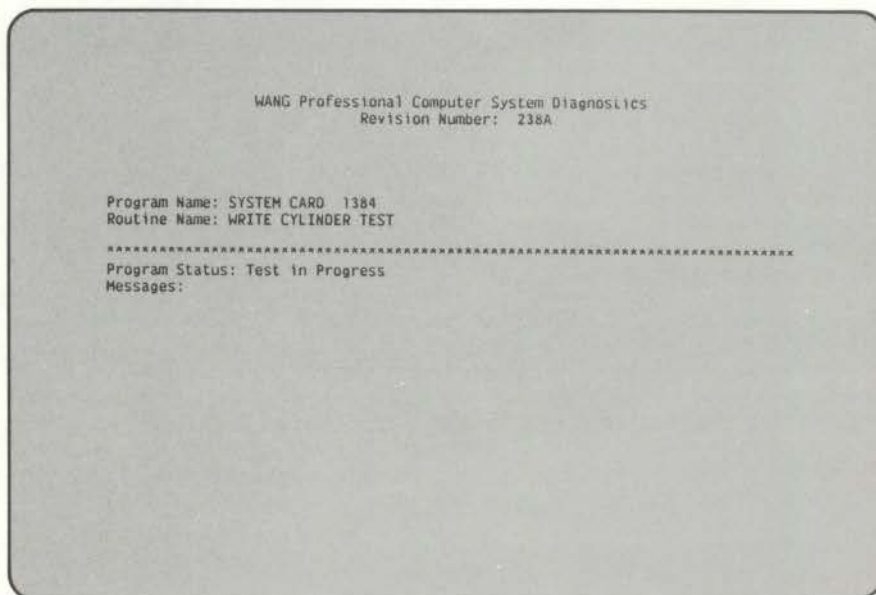


Figure B-4. Sample Test Screen

Each test is made up of various routines. The routines proceed one after another until the system detects an error. The Program Name field on the screen displays the name of the current test. The routine name changes as the various routines complete their testing. When all of the routines that make up a particular test finish, the program name changes and a new test begins. If an error occurs, the test screen freezes and the Likely Failing Module field in the report displays the one, two, or three most likely causes of the error. The Program Status field displays the current status of the testing. If the tests are waiting for you to input some information, the Program Status field contains the message "Enter Parameters." If an error occurs, the Program Status field displays an error message. The message area displays various types of information including warnings and instructions.

B.3.1 System Card Test

The System Card test includes routines that test the main memory and the diskette drives. Unless you deselect this test, the System Card test runs first. There is a pause in the System Card tests before the diskette drive tests begin. The display in Figure B-5 appears on the screen.

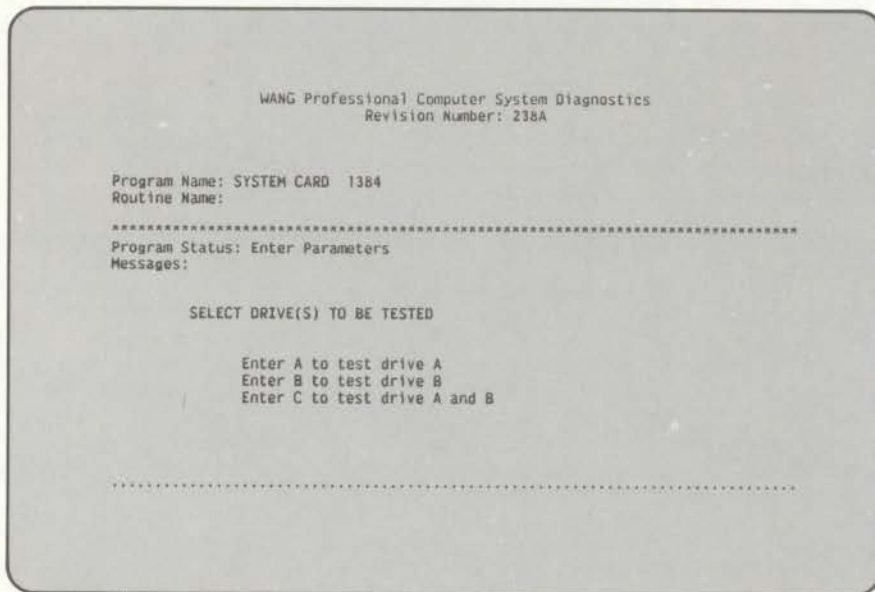


Figure B-5. Diskette Drive Test Screen #1

Follow these steps to run the diskette drive tests.

STEP 1: Read the message on the test screen.

STEP 2: Type A, B, or C and press EXEC. The screen in Figure B-6 appears.

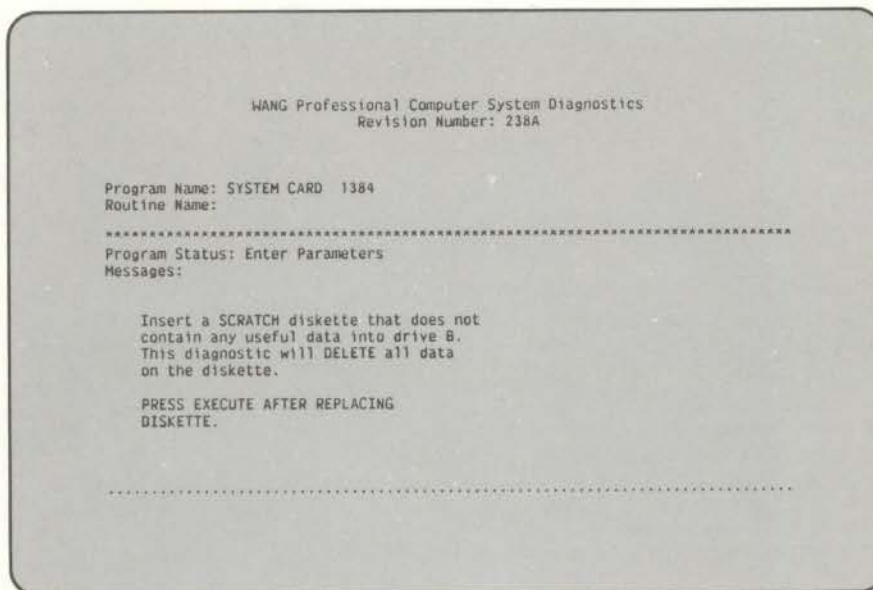


Figure B-6. Diskette Drive Test Screen #2

STEP 3: Replace the System Diagnostics diskette in Drive A with a blank diskette.

NOTE:

The testing involved in the System Card Format test reformats the diskette in Drive A. All of the files on the diskette in Drive A are erased in the reformatting process.

STEP 4: Press EXEC to continue with the System Card tests.

NOTE:

If you forget to replace the diagnostics diskette, the screen in Figure B-6 reappears along with the message "Drive A still has the PCDS diskette." The tests will not proceed until you replace the diagnostics diskette with a blank diskette and press EXEC.

STEP 5: Shortly after you press EXEC, the first screen for the Door Interrupt test appears on the screen. (Refer to Figure B-7.) Close the doors of the diskette drives and press EXEC.

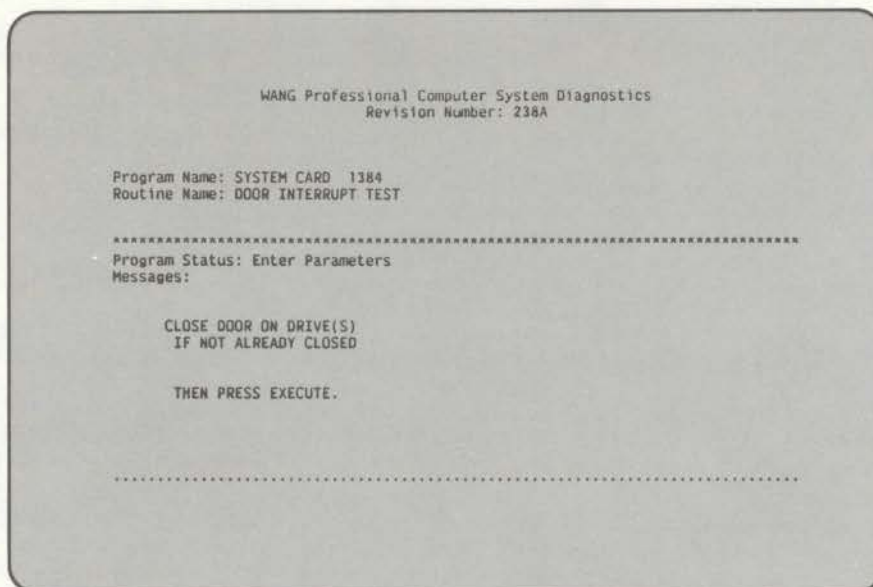


Figure B-7. Door Interrupt Test Screen #1

STEP 6: After you press EXEC, a second Door Interrupt test screen appears. (Refer to Figure B-8.) Open and close the doors of the diskette drives that are being tested and press EXEC.

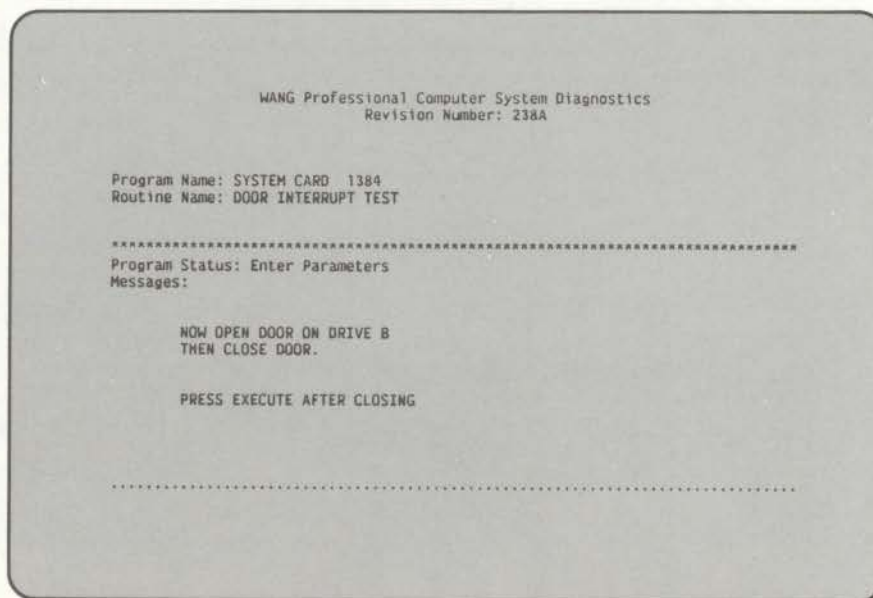


Figure B-8. Door Interrupt Test Screen #2

STEP 7: Remove the blank diskette when the test screen prompts you to do so. Reinsert the System Diagnostics diskette and press EXEC to continue with the other diagnostic tests.

NOTE:

If you forget to remove the blank diskette and attempt to proceed, the message "??Insure Diagnostics Diskette is installed??" appears on the screen. At this point, you must remove the blank diskette, reinsert the diagnostics diskette, and press any key except CANCEL to continue with the diagnostic tests.

B.3.2 Other Diagnostic Tests

In addition to the System Card test, the System Diagnostics diskette also contains diagnostic tests for the following devices:

- Expanded Memory card
- Winchester Controller card
- CP/M-80 Emulation card
- Wang monitor
- Industry-standard monitor
- Monitor/Graphics card set
- Local Communications card
- Remote Communications card
- Multiport Communications Controller (MCC) card
- Matrix printer
- Daisy printer

The System Diagnostics Menu (refer to Figure B-3) contains a selection for each item from the above list included on your PC. If you select any of these diagnostic tests, they run immediately after the System Card test, in the order that they appear on your menu. Many of these tests require no user intervention to run, or provide prompts that give you a sufficient explanation of what you must do to run them. The following tests, however, have special features, need additional equipment, or require an explanation before you attempt to run them.

- Winchester Controller Card test -- Please note that the Converging Diverging Seeks routine takes 1-1/2 minutes to complete, and the Sequential Reads Test routine requires 6-1/2 minutes. As long as the message "Stopped on Error" does not appear on the screen during these routines, you do not have a problem with your system.
- Monitor tests -- If you have a modem connected to a serial port, you must disconnect it before you can run any monitor diagnostics.

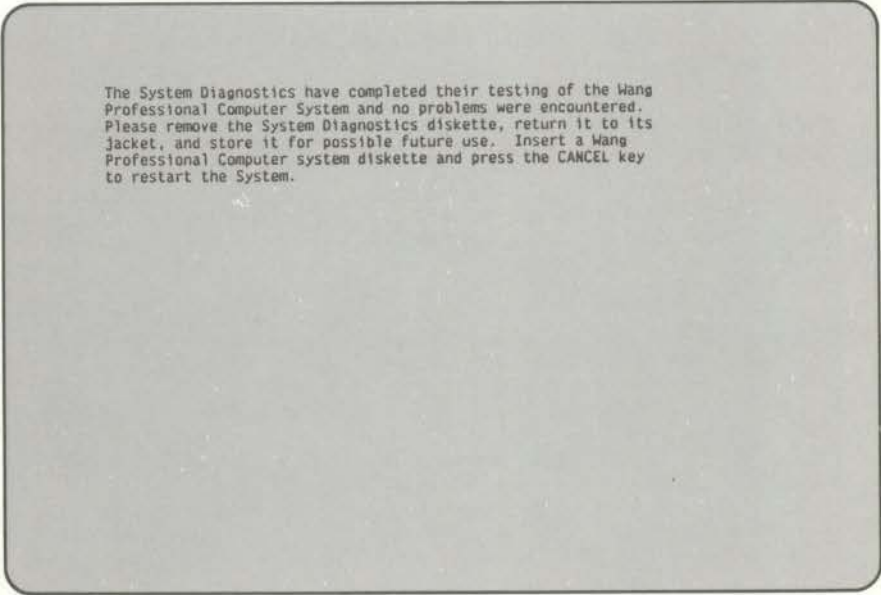
- Printer tests -- Make sure that your printer is on, properly connected, and has sufficient paper before you run a printer test. Also, at the start of the matrix printer diagnostics test, a menu appears listing the different matrix printer diagnostic routines that you can run. To run a routine, enter the number from 1 to 9 that corresponds to the routine you want to run and press EXEC. To run all routines, enter a 0 and press EXEC. To leave the matrix printer diagnostics, enter an X and press EXEC.
- Wang Monitor/Graphics Card Set test -- This test includes routines that test the appearance of various screen displays. During the first routine, a display of monitor card attributes appears. This display includes the complete PC character set, plus lines that appear in blinking, reverse video, bold, overscored, underscored, subscripted, and superscripted type. After you verify that this display is correct, press the MERGE key. The monitor alignment package routine then occurs. This consists of a title screen plus four alignment screen displays. Press any key on the keyboard to begin the test or to go from one routine to the next. (After the fourth screen, the routine returns to the first screen.) To exit this routine, press CANCEL.
- Remote Communications Card test -- You must install a parallel loop back connector (item #420-1104) and a serial loop back connector (item #420-1040) on the ports in the back of this card in order to run the diagnostic tests. (Contact your Wang representative for information on how to obtain these connectors.)

To install these connectors, you need only align the pins and sockets of both the connector and the port and press firmly. You cannot incorrectly mount the connector.

- Multiport Communications Controller (MCC) Card test -- This test requires the serial loop back connector in order to run. The back of the MCC card contains three serial ports. At the start of this test, the screen prompts you to install the serial loop back connector on Port 1 (the one closest to the fan). When you install the connector and press EXEC, the diagnostics run for Port 1. The screen then prompts you to install the connector on Port 2 (the port directly above Port 1) and press EXEC to run the diagnostics on Port 2. After the diagnostics finish for Port 2, you then install the connector on Port 3 and press EXEC to run the diagnostics for that port.

B.3.3 Final Diagnostic Screens

When all the System Diagnostic tests that you have selected are complete, one of two screens appears. If the System Diagnostics complete their testing without finding an error, the following screen appears.



The System Diagnostics have completed their testing of the Wang Professional Computer System and no problems were encountered. Please remove the System Diagnostics diskette, return it to its jacket, and store it for possible future use. Insert a Wang Professional Computer system diskette and press the CANCEL key to restart the System.

Figure B-10. No Error Detected Screen

However, if the System Diagnostics detect an error, you see the following screen.

The System Diagnostics have completed their testing of the Wang Professional Computer System and a problem was encountered. To display the error log on the Screen press the COMMAND key. If there are more errors than fit on the Screen use the NEXT and PREV keys to go between screens. For a printout of the Error Log press SHIFT + COMMAND. To restart the System insert a Wang Professional Computer system diskette and press the CANCEL key.

Figure B-11. Error Detected Screen

If you want to display the error log, press COMMAND. A display like the one shown in Figure B-12 appears on the screen.

Program Name	Routine Name	Slot Number	Pass Count	Error Number	Elapsed Time
SYSTEM CARD 1384	DOOR INTERRUPT TEST	00	0000	0001	00:00:08
Likely Failing Unit 1) FLOPPY DRIVE B 2) FLOPPY CABLE 3) SYSTEM CARD					

<< Press Space Bar to EXIT Display >>

NEXT - Next Screen
PREV - Previous Screen

Figure B-12. Sample Error Log

If you want to print out the error log on the Wang matrix printer, press SHIFT and COMMAND simultaneously.

If the System Diagnostics pinpoint a defective component, you should call the Wang Professional Computer Assistance Center to determine what you should do next.

APPENDIX C MESSAGES

This appendix contains the messages that the programs on System Diskettes I and II may display. It also includes a brief explanation of each message. The messages are listed in numerical order. The 2-digit number preceding each message is an international translation code that you can disregard if you are a domestic Wang PC user. This appendix also tells which version or versions of the start PROM the messages apply to. When two messages appear next to a number, the first message is the message for version 2.00 of the start PROM, and the message that follows it in parentheses applies to version 1.00 of the start PROM.

The messages incorporate various device names and expansion slot numbers. The list of device names contained in the messages includes the following:

- DRIVE A
- DRIVE B
- WINCHESTER
- VIDEO CARD
- LOCAL COM OPTION (version 2.00 only)
- OPTION CARD (version 2.00 only)
- SERIAL PORT
- PARALLEL PORT
- KEYBOARD

The range of legal slot numbers is from 01 to 15 (decimal). (Refer to Figure 9-3.) Messages that refer to the System card do not include a slot number.

WANG PROFESSIONAL COMPUTER REV. 2.00 (WANG PROFESSIONAL COMPUTER. REV 1.00)

The system is performing the power-on diagnostics and preparing to start. The revision number displayed is the version of the EPROM in your system.

01 START FROM device (WILL START FROM device)

This message indicates which start-up device the system will start from. The system uses the list of priority start-up devices described in Appendix G to select the start-up device. When this message appears on the screen, the power-on diagnostics have completed their tests. There is a 3-second pause after this message appears during which you can enter one of the following 1-letter commands: G (truncates the 3-second pause); P (runs the power-on diagnostics again); Q (executes a quick restart); D (redirects the start to another device); I (redirects console input to another device); or O (redirects console output to another device). Refer to Appendix G for a further explanation of these commands.

02 STARTING FROM device (version 1.00 only)

This message appears when the 3-second delay is over. The system is now ready to begin the final start-up sequence.

10 GO (version 2.00 only)

The feedback response that appears on the screen when you press G during the 3-second delay after the 01 START FROM device message. This truncates the 3-second delay.

11 RETRY (version 2.00 only)

The feedback response that appears on the screen when you press R after a START FAILED message. The system attempts the start sequence again.

12 QUICK RESTART (version 2.00 only)

The feedback response that appears on the screen when you press Q after a START FAILED message or during the 3-second delay after the 01 START FROM device message. The system attempts to restart, but does not diagnose memory.

13 POWER-UP DIAGNOSTICS (version 2.00 only)

The feedback response that appears on the screen when you press P after a START FAILED message or during the 3-second delay after the 01 START FROM device message. The system attempts to restart and runs the full power-on diagnostics.

14 RE-DIRECT START (version 2.00 only)

The feedback response that appears on the screen when you press D after a START FAILED message or during the 3-second delay after the 01 START FROM device message. This allows you to direct the start to a desired device, bypassing the normal hierarchy of start-up devices. (Refer to Appendix G.)

*21 device IN ## DEFECTIVE (device IN SLOT ## DEFECTIVE)

This warning appears for each start-up device and console output device that fails the power-on diagnostics. If the diagnostics can determine a reason for the problem, it appears directly underneath this message. Possible reasons are listed as messages 50-69 in this appendix.

*22 device DEFECTIVE (both versions)

This warning appears for each System card device, such as Drive B, that fails the power-on diagnostics. If the diagnostics can determine a reason for the problem, it appears directly underneath this message. Possible reasons are listed as messages 50-69 in this appendix.

***40 NO AUTO-START DEVICE (both versions)

The system could not find a usable start device during the start-up sequence. This message can occur if all of the auto-start devices (Drive A, Drive B, and the Winchester) are defective or nonexistent. You can also cause this message to appear if your system does not include a Winchester drive and you leave the diskette drive doors open while the system is starting. You must correct this situation before the system can proceed.

***41 START FAILED (both versions)
device - reason

The system encountered a serious error during the start-up sequence. You must correct this error before the system can start. Reasons that can appear in this type of message are listed as messages 70-76 in this appendix.

***42 INVALID INTERRUPT (both versions)

The system encountered an invalid interrupt during the start-up sequence. You must correct this condition before the system can start.

***43 PARITY ERROR (both versions)

The system encountered a memory parity error during the start-up sequence. You must correct this condition before the system can start.

***44 SYSTEM FILES MISSING (both versions)

The system cannot proceed until you restart the system from a diskette or Winchester disk that contains the system files.

***45 DISK READ ERROR (both versions)

The system cannot read the disk in the default drive. You can create this condition by starting from a defective or unformatted diskette or a defective or unformatted Winchester disk.

***46 DEFECTIVE START DISK (both versions)

The diskette or Winchester disk you are trying to start the system from contains invalid File Allocation Table (FAT) data.

***47 MISSING SYSTEM FILE (version 2.00 only)
[- file name]

The system file [- file name] is missing on the source from which you are trying to start.

***48 READ ERROR
[- device]

A read error occurred on the source from which you are trying to start. The message lists the device, if known, to localize the problem.

50 OR MISSING (version 1.00 only)

The device listed in message 21 or 22 is not installed in or connected to the system.

51 MEMORY ERROR (both versions)

The device listed in message 21 or 22 has a problem with its memory. In version 2.00, this message also lists the specific failure, if known.

52 READ ERROR (both versions)

A problem has occurred in transferring data from the option to the system. In version 2.00, this message also lists where the problem occurred, if known.

53 WRITE ERROR (both versions)

A problem has occurred in transferring data from the system to the option. In version 2.00, this message also lists where the problem occurred, if known.

54 DMA ERROR (both versions)

The Direct Memory Access chip is not transferring data correctly. In version 2.00, this message also lists where the problem occurred, if known.

55 STATUS ERROR (both versions)

A device or LSI chip returned an incorrect or bad status. In version 2.00, this message also lists the device, if known.

56 LOOP BACK (both versions)

There is a loop back connector attached.

57 SYSTEM CARD FAILURE (both versions)

One or more components on the System card have failed.

NOTE:

In messages 58 through 64, if the word specific appears in brackets, the message lists the specific device, if known, to localize the problem. If the word specific does not appear in brackets, the message always lists the specific device.

58 NOT READY [- Specific] (version 2.00 only)

A ready condition that was expected did not occur.

59 INIT FAILED [- Specific] (version 2.00 only)

Initialization failed.

60 MISSING Specific (version 2.00 only)

The specific signal or status did not occur (for example, MISSING VERT. SYNC.)

61 PROCESSOR FAILURE [- Specific] (version 2.00 only)

A microprocessor has failed.

62 REGISTER FAILURE [- Specific] (version 2.00 only)

A register failed.

63 INVALID Specific (version 2.00 only)

The specific is invalid (for example, INVALID COMMAND or INVALID STATUS.)

64 FAILED TO Specific (version 2.00 only)

During the power-on diagnostics, the specific failed to occur.

69 RAM SPACE EXHAUSTED (version 2.00 only)

The device could not be tested because too little room remains in RAM to copy the diagnostic PROM.

70 device READ ERROR (both versions)

A read failed on the particular device because the disk has defective data or the disk is not formatted correctly. In version 2.00, this message indicates that there is defective data on the disk. See also message 74.

71 device NO WANG START TRACK (both versions)

The disk in the start-up drive does not have a valid Wang start-up track.

72 device NOT READY (both versions)

The start-up device was not ready. You can cause this message to appear if you forget to insert a diskette in Drive A or B and have the door closed when you start your system.

73 device FAILURE (both versions)

Failure occurred for a reason other than those listed in messages 70 through 72 or 74 through 76.

74 device FORMAT FAILURE (version 2.00 only)

The read failed because of a format error.

75 device CAN'T FIND START
FILE (version 2.00 only)

The system cannot find the start file through the Local Communications card, Network card, or other device.

76 device INVALID START FILE (version 2.00 only)

The start file from the Local Communications card, Network card, or other device contains invalid data. This message is equivalent in meaning to message 71.

91 LOOPING ON POWER-UP (both versions)

The machine is in diagnostic mode, and is running its power-on diagnostics continuously. This occurs because the switch SW-1 (a 4-position DIP switch) on the System card is set to 0000 (all closed or all on).

Refer to The Wang Professional Computer Utility Programs User Guide for a listing and explanation of error messages that are not preceded by a number.

APPENDIX D KEYBOARD CODES

Table D-1 lists the Wang Professional Computer character set.

Table D-1. The Wang PC Character Set

Decimal	Hex	Character or Explanation
000	00	Null
001	01	Edit line where error occurred
002	02	Previous word
003	03	Stop program and return to BASIC command level
004	04	
005	05	Erase from cursor to end of logical line
006	06	Next word
007	07	Sound alarm
008	08	Destructive backspace
009	09	Tab
010	0A	Line feed
011	0B	Home cursor
012	0C	Clear screen and home cursor
013	0D	Carriage return
014	0E	Append to end of line
015	0F	
016	10	
017	11	Resume program listing on screen or printer
018	12	Toggle insert mode
019	13	Suspend program listing on screen or printer
020	14	Activate and update function key display
021	15	Clear logical line
022	16	
023	17	Delete word
024	18	
025	19	
026	1A	Clear from cursor to end of screen
027	1B	Cursor right/Escape
028	1C	Cursor left
029	1D	Cursor up
030	1E	Cursor down
031	1F	Delete character at cursor location

Table D-1. The Wang PC Character Set (continued)

Decimal	Hex	Character or Explanation
032	20	Space
033	21	Exclamation point !
034	22	Double quote "
035	23	Number sign #
036	24	Dollar sign \$
037	25	Percent sign %
038	26	Ampersand &
039	27	Single quote '
040	28	Left parenthesis (
041	29	Right parenthesis)
042	2A	Asterisk *
043	2B	Plus sign +
044	2C	Comma ,
045	2D	Minus sign -
046	2E	Period .
047	2F	Slash /
048	30	0
049	31	1
050	32	2
051	33	3
052	34	4
053	35	5
054	36	6
055	37	7
056	38	8
057	39	9
058	3A	Colon :
059	3B	Semicolon ;
060	3C	Less than sign <
061	3D	Equal sign =
062	3E	Greater than sign >
063	3F	Question mark ?
064	40	At sign @
065	41	A
066	42	B
067	43	C
068	44	D
069	45	E
070	46	F
071	47	G
072	48	H
073	49	I
074	4A	J
075	4B	K
076	4C	L
077	4D	M
078	4E	N
079	4F	O
080	50	P

Table D-1. The Wang PC Character Set (continued)

Decimal	Hex	Character or Explanation
081	51	Q
082	52	R
083	53	S
084	54	T
085	55	U
086	56	V
087	57	W
088	58	X
089	59	Y
090	5A	Z
091	5B	Left bracket [
092	5C	Backslash \
093	5D	Right bracket]
094	5E	Up arrow ↑
095	5F	Underscore _
096	60	Open quote "
097	61	a
098	62	b
099	63	c
100	64	d
101	65	e
102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	Left brace {
124	7C	Vertical bar
125	7D	Right brace }
126	7E	Approximate symbol ≈
127	7F	Cent sign ¢
128	80	Degree sign °
129	81	Center graphic ◆

Table D-1. The Wang PC Character Set (continued)

Decimal	Hex	Character or Explanation
130	82	Tab graphic ►
131	83	Return graphic ◄
132	84	Indent graphic →
133	85	Decimal tabulation graphic
134	86	Format graphic
135	87	Stop graphic
136	88	Note graphic
137	89	Merge graphic
138	8A	Down arrow ↓
139	8B	Up arrow ↑
140	8C	Left arrow ←
141	8D	Plus-or-minus sign ±
142	8E	Inverted exclamation
143	8F	Inverted question mark
144	90	A circumflex
145	91	A grave
146	92	A acute
147	93	A umlaut
148	94	A tilde
149	95	Left arrow
150	96	A angstrom
151	97	Down arrow
152	98	Ligature AE
153	99	C cedilla
154	9A	Double dagger
155	9B	Bullet
156	9C	E circumflex
157	9D	E grave
158	9E	E acute
159	9F	E umlaut
160	A0	a circumflex
161	A1	a grave
162	A2	a acute
163	A3	a umlaut
164	A4	a tilde
165	A5	Right arrow
166	A6	a angstrom
167	A7	Dagger
168	A8	Ligature ae
169	A9	c cedilla
170	AA	Ballot box
171	AB	Required space
172	AC	e circumflex
173	AD	e grave
174	AE	e acute
175	AF	e umlaut
176	B0	G hacek
177	B1	IJ ligature

Table D-1. The Wang PC Character Set (continued)

Decimal	Hex	Character or Explanation
178	B2	Dotted I
179	B3	I circumflex
180	B4	I grave
181	B5	I acute
182	B6	I umlaut
183	B7	Catalonian LL ligature
184	B8	N tilde
185	B9	O circumflex
186	BA	O grave
187	BB	O acute
188	BC	O umlaut
189	BD	O tilde
190	BE	OE ligature
191	BF	slashed O
192	C0	G hacek
193	C1	ij ligature
194	C2	dotless i
195	C3	i circumflex
196	C4	i grave
197	C5	i acute
198	C6	i umlaut
199	C7	Catalonian ll ligature
200	C8	n tilde
201	C9	o circumflex
202	CA	o grave
203	CB	o acute
204	CC	o umlaut
205	CD	o tilde
206	CE	oe ligature
207	CF	slashed o
208	D0	Icelandic Thorn
209	D1	Icelandic Eth
210	D2	Y acute
211	D3	S cedilla
212	D4	Open Quote
213	D5	u circumflex
214	D6	u grave
215	D7	u acute
216	D8	u umlaut
217	D9	Copyrighted symbol
218	DA	Registered Trademark symbol
219	DB	Prescription symbol
220	DC	a superior (for Number abbrev.)
221	DD	European open quotes
222	DE	section symbol
223	DF	paragraph symbol
224	E0	Icelandic thorn
225	E1	Icelandic eth

Table D-1. The Wang PC Character Set (continued)

Decimal	Hex	Character or Explanation
226	E2	y acute
227	E3	s cedilla
228	E4	close quote
229	E5	u circumflex
230	E6	u grave
231	E7	u acute
232	E8	u umlaut
233	E9	Trademark symbol
234	EA	International Monetary Symbol
235	EB	double arrow
236	EC	o superior (for Number abbrev.)
237	ED	European close quotes
238	EE	Beta
239	EF	centered dot
240	F0	pound sterling
241	F1	florin
242	F2	yen
243	F3	1/4
244	F4	1/2
245	F5	3/4
246	F6	accent circumflex
247	F7	accent grave
248	F8	accent acute
249	F9	accent umlaut (diaeresis)
250	FA	accent tilde
251	FB	accent cedilla
252	FC	accent hacek
253	FD	accent breve
254	FE	5 unit space
255	FF	Dead key

APPENDIX E SYSTEM SUMMARY

E.1 OVERVIEW

The System Summary is a chart that presents technical information about the Wang Professional Computer. You can create a profile of your system by checking off or filling in the appropriate information about each hardware and software option you have purchased. This system profile can serve as a valuable reference tool if you decide to expand your system, purchase additional software, or arrange for service or repair.

The System Summary contains a technical overview of each component. The information in the unshaded sections of the chart describes the technical capabilities of the standard Wang PC Base Unit. The information shown in the shaded sections explains the technical capabilities of the optional parts of the Wang Professional Computer.

In each shaded section, you can fill in the box next to the option currently installed in your system. Whenever you have a component that is not Wang-supplied, use the lines provided on the chart to record the requested information about that component.

If you take the time to keep the System Summary up to date, you will always have a current technical overview of your system. As a result, when you or someone else using your system needs this kind of information -- for example, to determine whether your system has enough memory to run a particular application -- that information will be easily accessible.

E.2 YOUR WANG PROFESSIONAL COMPUTER SYSTEM

HARDWARE

Electronics Unit Serial # _____ Model # _____	Dimensions: 23.1 x 14.9 in. x 6.5 in. Weight: 28-35 lb. Power Requirements: 115 or 230 VAC Expansion Slots: 5
(Optional) Desk Clamp	Restrictions: Desk must have at least a 3/4 in. lip. Length: 21.6 in. Weight: 1.5 lb.
Central Processing Unit	Microprocessor: Intel 8086 Type: 16-bit Speed: 8MHz
(Optional) Coprocessor Intel 8087	Type: 16-bit Speed: 8MHz Function: High-speed numeric data processing
Memory	Random Access Memory: 128KB parity checked Access Time: 200ns for each 64K-bit RAM chip Cycle Time: 350Hz for each 64K-bit RAM chip
(Optional) Additional Memory (maximum total 640KB)	128KB card 256KB card 384KB card 512KB card
Total main memory in this system is: 128KB 256KB 384KB 512KB 640KB	
Erasable Programmable Read Only Memory	Size: 8KB Functions: Power-on diagnostics Start-up instructions (bootstrap)

HARDWARE

Communications	Type: Serial RS-232-C Baud Rates: 16 common rates between 50 and 19,200 Discipline: Asynchronous, Synchronous Mode: half or full duplex Protocols Supported: 3270, 2780/3780, Remote Wangnet, Local Wangnet
Diskette Drive Unit	Description: 5 1/4 in. drive Uses: DSDD or SSDD diskettes, 8 or 9 sectors per track Records At: 48 tracks per inch Storage/Diskette: 360KB
(Optional) Second Diskette Drive	(Same specifications as first diskette drive)
Winchester Disk Drive	Type: Winchester Media Size: 5 1/4 in. Maximum Memory: 10MB
Clock	Type: 8MHz
Keyboard	Home Row Key Height: 1.2 in. Keys: 101 Dimensions: 18.3 in. x 7.8 in. x 1.7 in. Weight: 4.5 lb. Programmable LEDs: 5 Key Groups: typewriter word processing/special function numeric editing cursor control special operations Operates At: 62.5 baud Keyboard Interface: UART (Universal Asynchronous Receiver Transmitter) Audio: 3 tones, 2" speaker

HARDWARE

Video Card Options:

Industry-standard
Monitor/Graphics card with
Monochrome Monitor:

Screen Size: 80 x 25 characters
Graphics Resolution: 640 x 225 dots

or

Industry-standard
Monitor/Graphics card with
Color Monitor:

Screen Size: 80 x 25 characters
Graphics Resolution: 640 x 225 dots
Number of Colors: 8 to 16, depending on
monitor
Character Cells: 120 dot (10x12)

Wang Monochrome Monitor

Screen Size: 12 in. diagonal
Dimensions: 13 in. x 10.8 in. x 11.8 in.
Weight: 14 lb.
Controls: Brightness, Contrast

Wang Monitor Card

Monochrome Display: 80 x 25 characters

Wang Graphics Card

Graphics Resolution: 800 x 300 dot

Monitor Arm

Range of Motion: 90, 180, 360 degrees
Control of Screen: Tilts up, down, left, or
right

Other Available Monitors

Make: _____
Model: _____
Serial # _____

Color Monitor

Screen Size: _____
Dimensions: _____
Weight: _____
Power: _____
Controls: _____

HARDWARE

Printers:

Wang Matrix Printer
Serial # _____

Dimensions: 14.7 in. x 12 in. x 4.2 in.
Weight: 12-15.4 lb.
Speed: 80 CPS

Wang Daisy Printer
Serial # _____

Dimensions: 19.5 in. x 12.5 in. x 9 in.
Weight: 43 lb.
Power: 115 or 230 VAC
Speed: 20 CPS

Wang PC-PM012 Printer
Serial # _____

Dimensions: 24.25 in. x 17.75 in. x 9.5 in.
Weight: 50 lb.
Speed: 20 CPS

Other Compatible Printer

Make: _____
Model: _____
Serial # _____

Optional Cards

Local Wangnet

Connected To: _____

Remote Wangnet

SOFTWARE

System Diskettes

Operating System: Wang-enhanced MS-DOS
Version 2.0
Diagnostics: System Diagnostics diskette
Language: Wang interpretive BASIC

Optional Languages

Wang PC BASIC Compiler
Wang PC COBOL Compiler
Wang PC FORTRAN Compiler
Wang PC Pascal Compiler
Wang PC Assembly Language

Optional Software Support

PC Asynchronous Communication
PC Remote WangNet
PC Local WangNet

Optional Applications Software

Multiplan
Word Processing
Other: _____

DOCUMENTATION

Documentation Guide
Introductory Guide
Utility Programs User Guide
BASIC Language Guide

Manuals Included with Purchase of the Appropriate Software Packages

Program Development Guide
Language Reference Manuals
Application Training and Reference Manuals

APPENDIX F REPACKING YOUR SYSTEM

F.1 INTRODUCTION

The purpose of this appendix is to provide you with the instructions necessary to disconnect and transport your Wang Professional Computer system. It is important to follow these instructions if you are repackaging your system prior to sending it out for repair, or if you are moving it from one location to another.

F.2 REPACKING YOUR SYSTEM

The first step in repacking your system is to disconnect the components. Disconnect the power cord, monitor cables, and keyboard cables, as shown in Figure F-1.

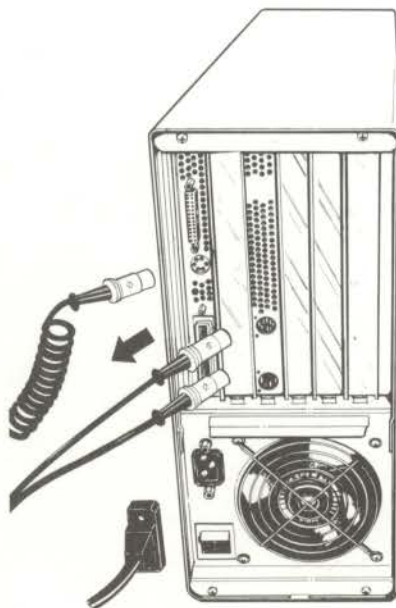


Figure F-1. Disconnecting the Wang Professional Computer

For more complete instructions on how to disconnect each component, refer to Chapter 2 and simply reverse the order of the procedures. If you have a printer, refer to your printer manual and reverse the unpacking and connecting procedures.

When you begin to repack your system, always use the original boxes and packing material. Place the foam cushions back on the equipment before you box each piece; this will ensure that the cushions are aligned properly. It is important to use the foam cushions, since moving the components subjects them to considerable vibration and shock. The foam cushions your PC was packed in were designed to absorb this shock and to protect the equipment from damage.

STEP 1: Repack the keyboard as shown in Figure F-2.

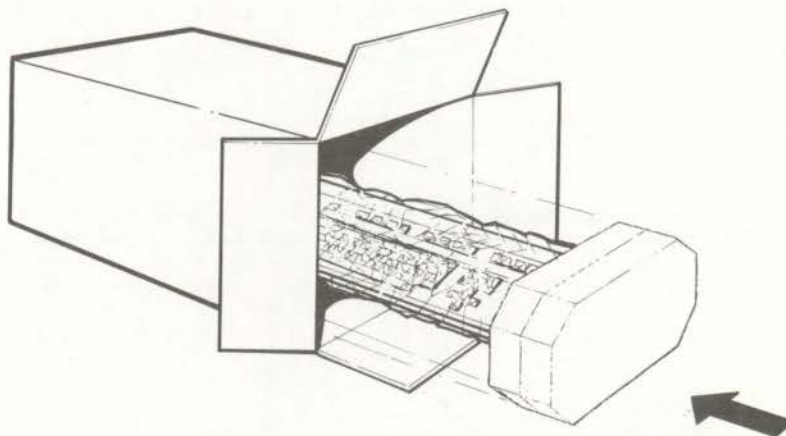


Figure F-2. Repacking the Keyboard

STEP 2: Repack the electronics unit as shown in Figure F-3. Be sure to replace the diskette drive shipping protector(s).

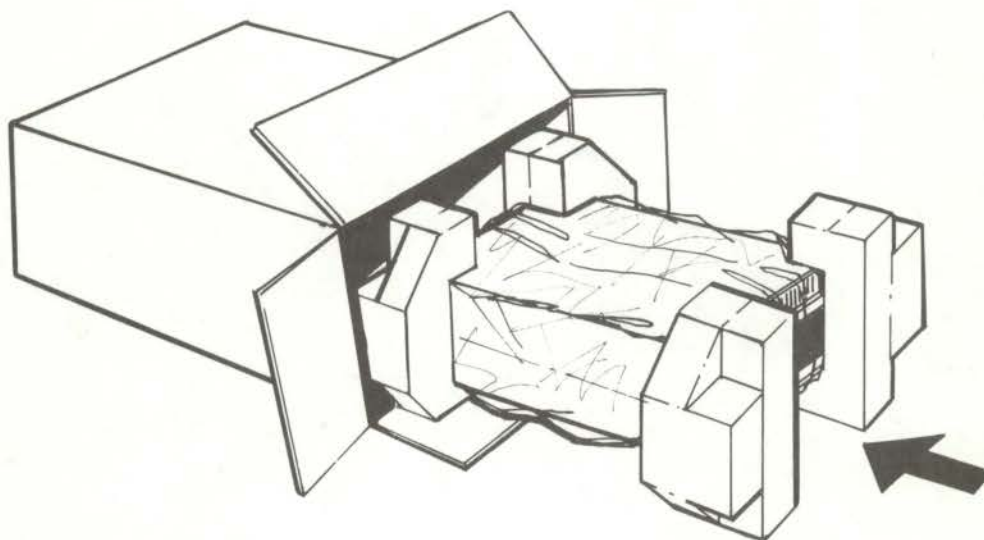


Figure F-3. Repacking the Electronics Unit

STEP 3: Repack the Wang Monochrome Monitor as shown in Figure F-4.

CAUTION:

Use special care when handling the monitor; the CRT (Cathode Ray Tube) contains glass, which can break and implode. It is best to grasp the monitor on both sides, rather than on the front and rear.

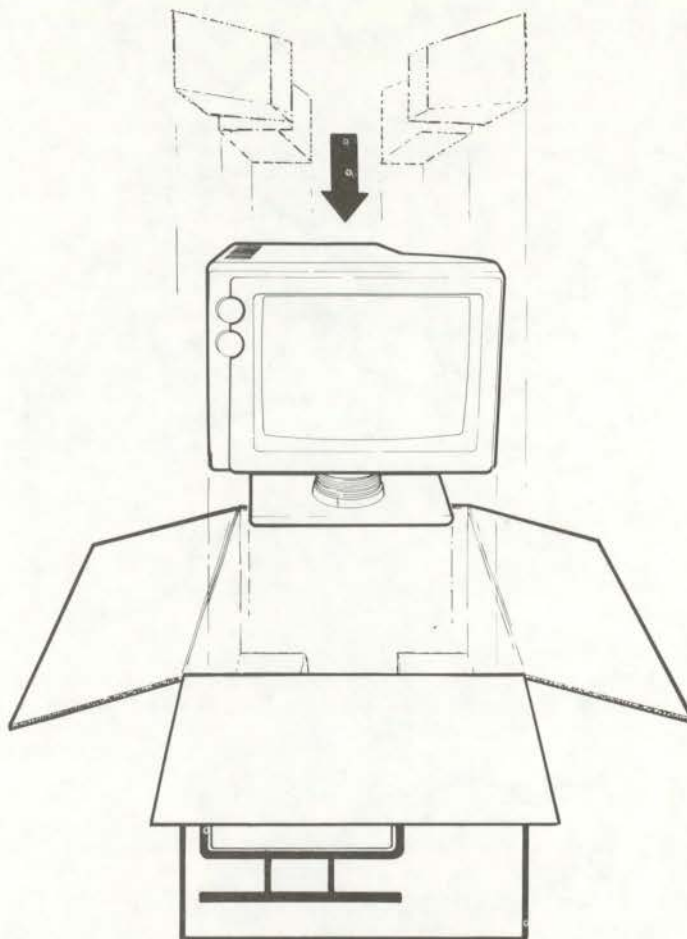


Figure F-4. Repacking the Wang Monochrome Monitor

STEP 4: Inspect each box to make sure that all components are correctly packed in their respective boxes.

STEP 5: Seal each box with industrial-strength packaging tape.

APPENDIX G START-UP PROCEDURES

The Wang Professional Computer provides you with an extremely flexible set of start-up options that you can use to direct the start of your system. This appendix reviews the details of the normal start-up procedure and indicates how you can use the various start-up options.

The start-up sequence in the Wang PC begins as soon as the power-on diagnostics finish testing the system's components. If the power-on diagnostics do not find any problems with your system, the following Start-up display appears on your screen.

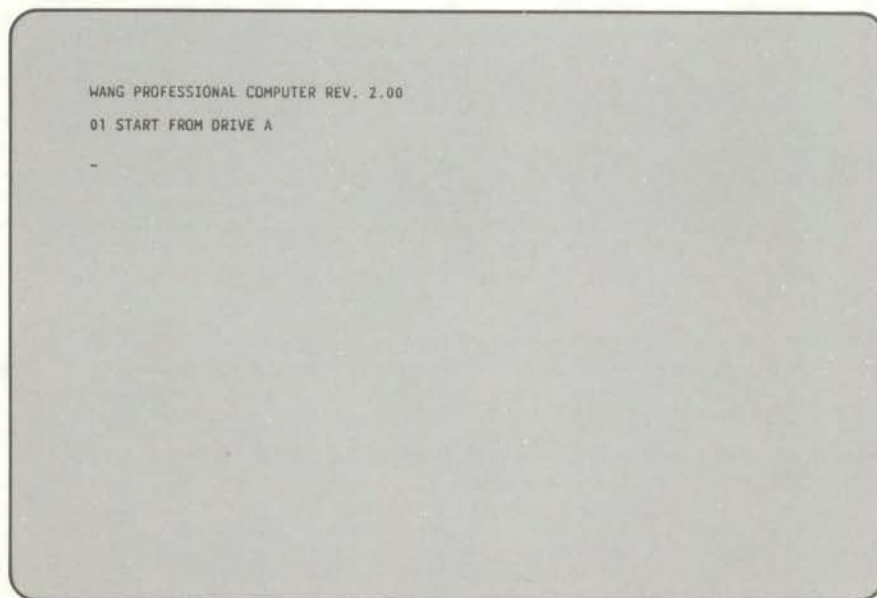


Figure G-1. Sample Start-up Screen

NOTE:

If you have version 1.00 of the start PROM, the following messages appear on this screen:

```
WANG PROFESSIONAL COMPUTER. REV 1.00.
01 WILL START FROM DRIVE A
02 STARTING FROM DRIVE A
```


If you are using a single drive system or a Winchester drive system with version 1.00 of the start PROM, your system displays the messages ***22 DRIVE B DEFECTIVE and 50 OR MISSING. These are merely informational messages that indicate that the second diskette drive (Drive B) is not present in your system. They do not interfere with the start-up sequence.

If the start-up is successful, the next screen you see is the Date and Time screen, as shown in Figure G-2.

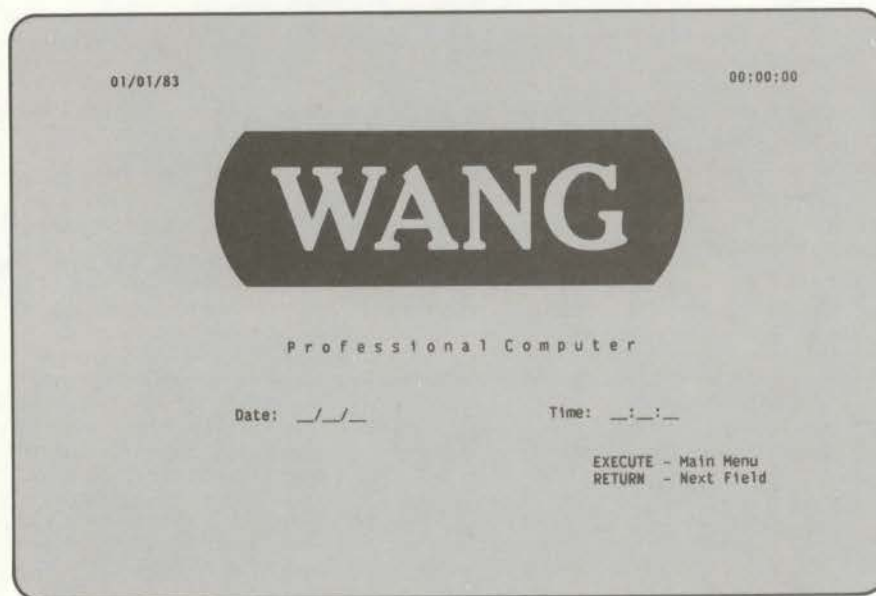


Figure G-2. The Date and Time Screen

As you probably noticed, before the system actually reads the system software, it displays a message indicating the device it intends to start from. It does this by running through a prioritized list of start-up devices until it finds the first operational start-up device. The prioritized list of devices is as follows:

- DRIVE A
- DRIVE B
- LOCAL COMMUNICATIONS OPTION and all future start options
- WINCHESTER (DRIVE C)

For start devices other than Drives A, B, and C, the system checks the Local/Remote switches. The system selects the device in the lowest numbered slot that has its switch set on Remote as the start-up device.

If you want to specify a particular start-up device, you can do this using the prioritized list of devices. For example, if you want your system to start from Drive B, open the door to Drive A, turn on the power switch or restart the system, and insert System Diskette I in Drive B. If you want to start the system from the Winchester drive, open the door of the diskette drive and turn on or restart your system. In order for your system to start successfully from the Winchester, there must be a copy of the system software on the Winchester disk.

Assuming you start your system from Drive B, once the power-on diagnostics conclude their testing, a message appears on the Start-up screen. If you have version 2.00 of the start PROM, the following message appears.

01 START FROM DRIVE B

The cursor then appears directly to the right of this message for three seconds. For version 1.00 of the start PROM, the messages that appear are the following.

01 WILL START FROM DRIVE B

02 STARTING FROM DRIVE B

In either version of the start PROM, you can truncate the 3-second delay after the number 01 message appears by entering the 1-letter command G.

If the system starts successfully, the Date and Time screen appears. If the system cannot start, a message similar to the one shown below appears.

***41 START FAILED:

72 DRIVE B - NOT READY

This message indicates that the start-up sequence failed because Drive B is not ready to start. Check Drive B to make sure you have correctly loaded System Diskette I. There are a variety of other messages that indicate problems encountered during the start-up sequence. You can find a complete list of these start-up messages in Appendix C. Messages that are preceded by three asterisks indicate a serious problem and require you to correct the cause of the start-up failure before you can proceed.

NOTE:

The numbers preceding each message are designed as an aid to Wang's international customers. These numbers have no importance to Wang's domestic customers.

In any event, you have several choices about how to proceed after you receive a START FAILED message. After you correct the cause of the problem, you can restart your system or respond to the prompt under the message by typing a one-letter command. These commands are as follows.

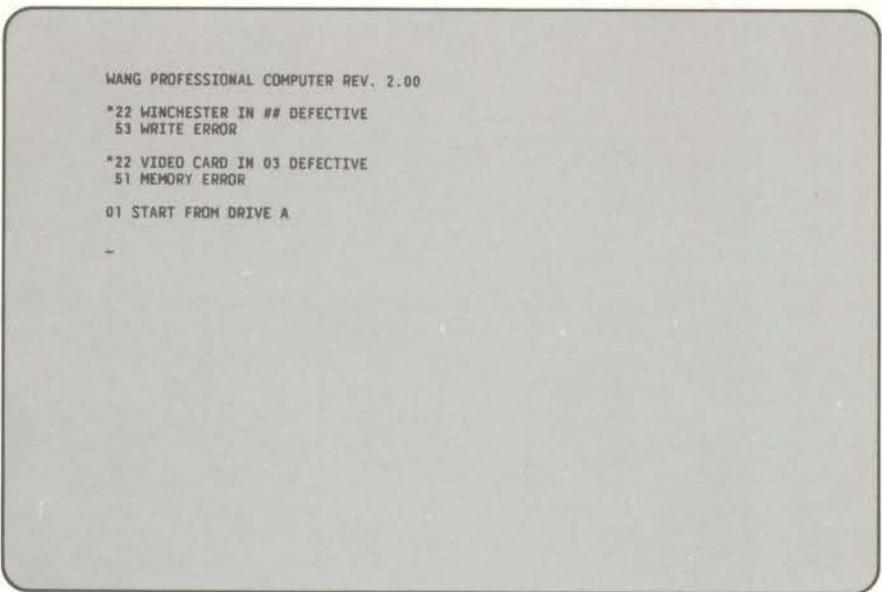
- P -- Reruns the power-on diagnostics and attempts to restart. For version 2.00 of the start PROM, the message 13 POWER-UP DIAGNOSTICS appears on the screen when you press P.

- R -- Attempts the start procedure again; no diagnostics run. In version 2.00 of the start PROM, the message 11 RETRY appears on the screen when you press R.
- Q -- (version 2.00 only) Pressing Q executes a quick restart. The message 12 QUICK RESTART appears on the screen. The resulting restart procedure skips most of the time-consuming memory tests.
- D -- During the start-up process, allows you to direct the start to a desired start-up device, bypassing the normal start-up device hierarchy. In version 2.00 of the start PROM, the message 14 RE-DIRECT START appears on the screen when you press D.
- I -- Allows you to direct console input from a specified device.
- O -- Allows you to direct console output from a specified device.

The start-up options and messages are the same for the Winchester drive as they are for the diskette drive, so you can use all of the same procedures to start up your system from the Winchester. Make sure that you have copied System Diskette I to the Winchester disk (refer to Section 8.2) before you attempt to start your system from the Winchester. Failure to do this will cause a message similar to the following to appear:

```
***41 START FAILED
    71 WINCHESTER NO WANG START TRACK
```

If the power-on diagnostics detect an error while testing a start-up device, the Start-up screen displays a defective device error as illustrated in Figure G-3.



```
WANG PROFESSIONAL COMPUTER REV. 2.00  
*22 WINCHESTER IN ## DEFECTIVE  
53 WRITE ERROR  
  
*22 VIDEO CARD IN 03 DEFECTIVE  
51 MEMORY ERROR  
  
01 START FROM DRIVE A
```

Figure G-3. Sample Defective Device Message

The sample message indicates that the power-on diagnostic tests have found that the Winchester drive in Slot ## is defective and therefore cannot be used as a start-up device. The sample message also indicates that a video card is defective. Notice that the messages tell you the expansion slots in which the defective devices are located. (Refer to Figure 9-3.) Since Drive A is available as a start-up device and a second video card is functioning normally, the system can start. However, you will not be able to use the Winchester drive or the defective video card until they are repaired. The single asterisk preceding the messages on the sample screen indicates that although you have a problem, it isn't serious enough to interfere with the start-up. The Start-up screen displays as many defective device messages as your system can generate. You can find a complete description of defective device error messages in Appendix C.

APPENDIX H CHANGING THE VOLTAGE SETTING

The Wang Professional Computer has a power supply that allows you to set the voltage at either 115 or 230 volts AC. The label on the back of the electronics unit indicates that the power supply was set at 115 volts AC at the time the electronics unit was manufactured.

CAUTION:

If you need to use 230 volts AC, you must reset the voltage selector switch located inside the electronics unit before you connect or use your system. Failure to change the voltage selector can seriously damage your system. Disconnect the power cord and all other connections from the back of the electronics unit before you start this procedure.

Use the following steps to change the voltage setting.

STEP 1: Remove the cover from the electronics unit by following the procedure described in Section 9.2.1.

STEP 2: Locate the voltage selector switch. (Refer to Figure H-1.)

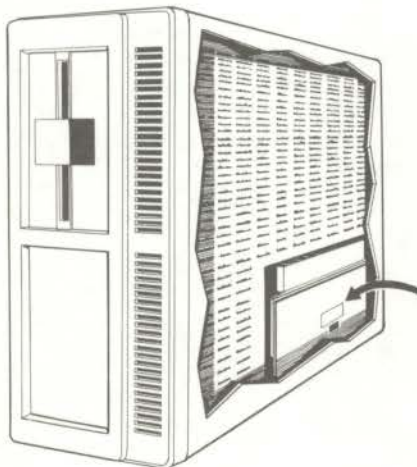


Figure H-1. The Voltage Selector Switch

The detail in Figure H-2 shows the position the switch is in when it is set at 115 volts. The black lettering, with the numbers 115V, is visible when the switch is in this setting.

STEP 3: Use a screwdriver to flip the switch to the 230-volt setting. Place the screwdriver above the ridge that divides the switch in half. Then push the screwdriver against the ridge and toward the 115-volt lettering. (Refer to Figure H-2.) You should now see 230V in white lettering.

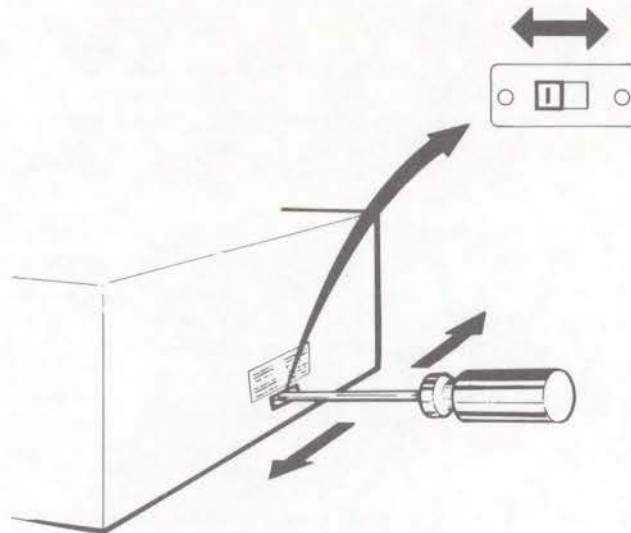


Figure H-2. Changing the Voltage Selector Switch Setting

STEP 4: Replace the chassis in the electronics unit cover by following the steps described in Section 9.2.7.

At this point, it is safe to connect your system and begin to operate it. If you have never connected the Wang Professional Computer before, you should turn to Section 2.4. If you have previously connected your system, you can review the system connections by reading Section 9.2.8.

APPENDIX I WANG PC DEVICE DRIVERS

I.1 GENERALIZED TABLE-DRIVEN PRINTER DRIVER

The generalized table-driven printer driver is included as part of the system software. The generalized printer driver supports any ASCII printer provided that the printer supports the items listed below. Refer to your printer manual to determine if your printer operates according to the specifications listed below.

- It must support a Centronics type parallel or serial RS232C hardware interface
- If your printer is a serial printer, it must support DC1/DC3(XON/XOFF) protocol
- It must support control codes for line feed (LF), form feed (FF), and carriage return (CR)
- It must have a dip switch which disables automatic line feed
- If your printer is used for word processing, it needs a 24 lines per inch (lpi) increment for correct printing of the subscript, superscript, and double underscore attributes. The double underscore defaults to a 1/48 inch increment if supported.

To ensure that your printer operates correctly, you must check three items.

1. The file CONFIG.SYS must include the name of the correct printer driver program (PAR1DRVR.COM for parallel printers and/or SER1DRVR.COM for serial printers).
2. The correct printer function table(s), and, if required, the correct character translate table(s) for your printer must be available within the system software. Wang supplies printer function tables and character translate tables for two Wang printers.
3. The file PRNXLT.COM, which is automatically loaded by both printer driver programs, must specify the correct printer tables.

NOTE:

If you have a Wang PC-DW20 printer, you need to check that DW20DRV.R.COM is the printer driver program specified in CONFIG.SYS and that the files DW20DRV.R.COM and DAISY06 are on System Diskette I. (Copy these files to System Diskette I if necessary.) Use the procedure described below to specify DW20DRV.R.COM as part of CONFIG.SYS. Once you have specified this printer driver program, you do not need to use any of the other printer utilities described in this appendix.

Within CONFIG.SYS, you must specify either one or both of the generalized printer driver programs. The commands you use to specify the printer drivers should appear as the last lines within the CONFIG.SYS file. For parallel printers, you would enter the line

```
DEVICE = /PAR1DRV.R.COM
```

For serial printers, you would enter the line

```
DEVICE = /SER1DRV.R.COM
```

If you have both printers, you would enter both of these commands on separate lines. The procedure for modifying CONFIG.SYS is described below.

The printer function tables include the specifications for each printer, including baud rate, number of data bits, parity, and number of stop bits. The specifications you need for the table are supplied with the printer. Each function table is a file on System Diskette I. Every function table file has the extension ".PDT". Wang has provided the following tables:

- PM010v2.PDT for the Wang PC-PM010 80 cps matrix printer (parallel)
- PM012v2.PDT for the Wang PC-PM012 20 cps daisy printer (serial)

NOTE:

The file names for the printer function tables and the character translate tables (see below) include a version number, which is the v1 or v2 portion of the name. As the printer function and character translate tables are updated, the version number changes. The file names will also change to match the version number. Therefore, the v1 or v2 portion of the file names may change with new releases to v3, v4, and so on.

If you have either of the two printers listed above, you do not have to create a printer function table. Otherwise, you have to create a table using a separate utility, the Printer Function Table Editor, that you can access from the Printer Support selection on the Main System Menu. Refer to Section I.2.1 for a description on how to run this utility.

Character translate tables, if required, are loaded along with the printer function tables. All character translate tables are files that must have the file extension ".CTT". The character translate tables that have been provided by Wang include the following:

- PM010v1.CTT, the table for the PC-PM010 printer
- PM012v2.CTT, the table for the PC-PM012 printer

If you are not using the printers for which there are ".CTT" tables, then you may also have to create a character translate table using a separate utility, the Character Translate Table Editor. You can access this utility from the Printer Support selection on the Main System Menu. Refer to Section I.2.2 for a description of how to run this utility.

Each of the printer driver programs automatically calls on PRNXLT.COM and loads the specific printer tables. For the parallel printer driver, PRNXLT.COM uses by default the printer function table and character translate table for the Wang PC-PM010 printer. For the serial printer driver, PRNXLT.COM uses by default the printer function table and character translate table for the PC-PM012 printer. If you are using these printers, you do not have to modify PRNXLT.COM. If you are using any other printer, then you must modify PRNXLT.COM to load the appropriate tables. To modify PRNXLT.COM, use a special utility, the Printer Index Table Editor, that you can access from the Printer Support selection on the Main System Menu. Refer to Section I.2.3 for a description of how to run this utility.

NOTE:

The PM012v2.PDT function table transmits data between the system and the PC-PM012 daisy printer as follows: 1200 baud rate, 8 data bits, no parity, and 1 stop bit. Of particular importance is the baud rate. Before using your daisy printer, you should check the dip switch to ensure that it is set at 1200. The illustration below shows you how the dip switch selections for position 1, 2, and 8 should be set for 1200 baud. For more information, refer to your printer manual for instructions on how to check and change, if necessary, the printer dip switch.

		ON	OFF	
1200/OPT	8	X		110/300
12	7			11 Page Size
ON	6			Auto LF
ON	5			Self Test
PTR/RDY	4			DC1/DC3
Parity-ON	3			OFF
-OFF	2	X		EVEN
110/1200	1	X		300/OPT

To select a particular printer port, use the Printer Redirection utility. On the Printer Support Menu, there are three Print Redirection options, each of which directs the system to a different port:

- Redirect to Console
- Redirect to Parallel Port #1
- Redirect to Serial Port #1

By default, the system is directed at start-up time to the parallel port unless you have specified SER1DRV.R.COM in CONFIG.SYS. If that is the case, the system is directed to the serial port. Therefore, you do not have to run the Redirection utility unless you have both a parallel and serial printer and you have specified both PAR1DRV.R.COM and SER1DRV.R.COM in CONFIG.SYS, and you want to use both printers during one session. At that time, to use the parallel printer for the first time, you would have to run the Redirect to Parallel Port #1 option. If you wanted to use the serial printer after using the parallel printer, you would have to run the Redirect to Serial Port #1 option.

Use the procedure below to edit CONFIG.SYS (Steps 1 through 10) and run the Printer Redirection utilities (Steps 11 through 13). Test your system using Step 14 to ensure that you have correctly completed the necessary steps to use your printer.

STEP 1: Insert System Diskette I in Drive A. Start up your system.

STEP 2: If you have not done so already, make a backup copy of System Diskette I using the DISK COPY utility, available from the System Utilities Menu. Refer to Section 3.5 for instructions on how to use the DISK COPY utility.

STEP 3: Return to the Main System Menu. Select the Program Development option.

STEP 4: Replace System Diskette I with System Diskette II when the system prompts you (in next step).

STEP 5: Select the Editor option from the Program Development Menu.

STEP 6: If you have a dual-diskette drive system, type A:CONFIG.SYS on the line provided for the file name. If you have a single-diskette drive system, you also enter A:CONFIG.SYS, but you must also replace System Diskette II with System Diskette I. Press EXEC.

STEP 7: Use the South cursor key to move the highlighted line to the last line of the CONFIG.SYS file, which is SHELL = /MENUDRV.R.COM -N001 -P/BIN. Press EXEC to create a blank line below this line and to move the cursor to the beginning of the blank line.

STEP 8: If you are using just a parallel printer, enter DEVICE = /PAR1DRV.R.COM. If you are using just a serial printer, enter DEVICE = /SER1DRV.R.COM. If you are using both printers, enter both commands on separate lines.

NOTE:

If you are using your system for word processing, and it is not an expanded system (i.e., it does not have more than 128KB of memory) then you can specify only one printer driver program in CONFIG.SYS.

STEP 9: Press SHIFT + CANCEL simultaneously to tell the system that you have finished editing CONFIG.SYS. Press EXEC to save your changes. The system automatically returns to the Program Development Menu.

STEP 10: Restart your system. The system automatically loads the printer driver program(s) you specified in CONFIG.SYS and displays on the screen which program(s) is being loaded.

STEP 11: Make a backup copy of the new CONFIG.SYS file.

STEP 12: If you are using two printers, you may have to run the Printer Redirection utility from time to time. Select the Printer Support selection from the Main System Menu. Press EXEC.

STEP 13: The Printer Support Menu, represented in Figure I-1 appears.

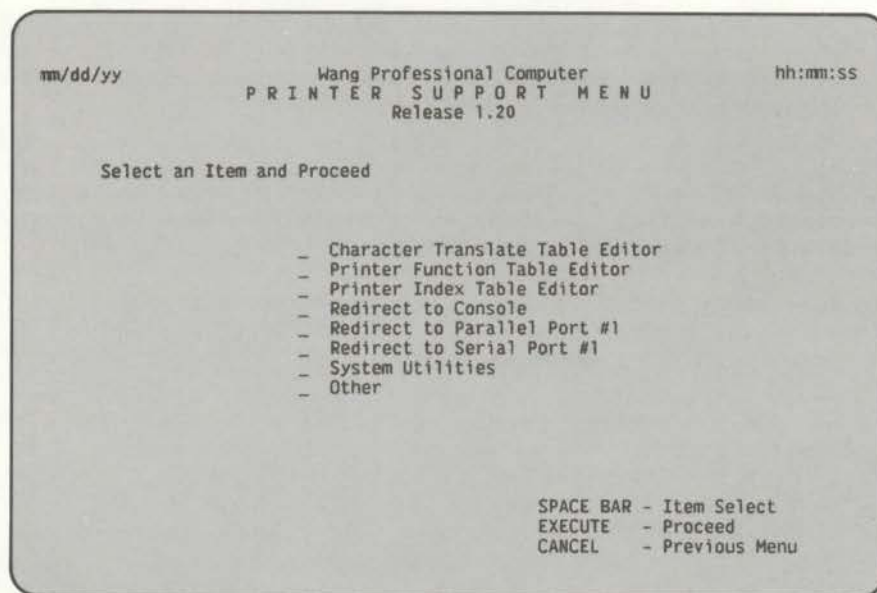


Figure I-1. Printer Support Menu

Select Redirect to Parallel Port #1 to direct the printer path to the parallel port for use with parallel printers; press EXEC. The message "Redirection Complete" appears on the screen after the system runs the redirection program.

Select Redirect to Serial Port #1 to direct the path to the serial port for use with the serial printers; press EXEC. The message "Redirection Complete" appears on the screen after the system runs the redirection program.

STEP 14: To see if your printer is working correctly, use the Word Processing application (if available) to create the test document listed on the next page. Select the Applications option from the Main System Menu and press EXEC. Insert the Word Processing software diskette in Drive A. Select Word Processing from the Applications Menu and press EXEC. Enter the test document exactly as it appears in this manual and then print it (refer to The Wang Professional Computer Word Processing Reference Guide). Compare the printout to the test document in this manual. If it is different, check your word processing document to ensure you did not make an error while creating it. If there were no errors in your document, then you may have made a mistake in modifying CONFIG.SYS, creating a ".PDT" or ".CTT" table, or running the Printer Redirection utility. Review Steps 1 through 13, correct any errors, and try to print the test document again.

Test document:

no attributes

print^{superscript}

print_{subscript}

line underscored

line double underscored

print bold

print^{super+under+double+bold-double}base

print_{sub+under+double+bold-double}base

print under+bold-bold-under

print double+bold-bold-double

print^{cccc_{cccc}ccccbase}

NOTE:

Some matrix printers do not print underscoring as a continuous line, but as a separate line under each character.

Transparent Mode

The Generalized Printer Driver can be put into a transparent mode of operation where all input data are passed directly through the driver and output to the peripheral device. Transparent mode is supported in three ways: the driver defaults to transparent mode when it is loaded; transparent mode is set by running the Transparent Mode utility; and transparent mode is enabled and disabled dynamically by a user-created applications program.

To have transparent mode selected as the default, complete the procedure described below.

Step 1: Select Printer Support from the Main System Menu.

Step 2: Select Printer Function Table Editor from the Printer Support Menu.

Step 3: Select Prefill Function Tables from the Printer Function Table Editor Menu and load the printer function table for your printer.

Step 4: After you have loaded the printer function table, return to the Printer Function Table Editor and select Supported Functions. From the Supported Functions Menu, select Transparent Mode. Press EXEC until the Printer Driver Editor menu appears.

Step 5: Select Write to Disk from the Printer Function Table Editor Menu to save the printer function table that now designates the default transparent mode.

To use the Transparent Mode utility which is located on System Diskette I, use the procedure described below. Transparent mode is frequently required for use with a particular application. It is sometimes necessary to enter transparent mode to print items such as graphics which the generalized printer drivers do not support. When you run an application that requires transparent mode, first enter transparent mode, run the application, then exit transparent mode. The printer driver is then available for use by other applications.

The best procedure for accessing the Transparent Mode utility is to create and execute a batch command file to enter or exit transparent mode. The file must contain the line PRNMODE.COM 1 to enter transparent mode, and the line PRNMODE.COM 0 to exit transparent mode. Note that the batch command file and the file COMMAND.COM must reside on the same disk as the utility and batch file. Refer to The Wang Professional Computer Utility Programs User Guide for information on how to use the DOS Command Processor and how to create batch command files.

You can also add entries for entering and exiting Transparent Mode to the Applications Menu. To do this, you must modify the Applications Menu data file APPMENU.DAT by using the MODIFY SYSTEM MENUS utility. The procedure listed below describes how to modify the Applications Menu assuming that your

system has two diskette drives. Refer to The Wang Professional Computer Utility Programs User Guide for information on how to run the MODIFY SYSTEM MENUS utility on systems with one diskette drive or with one diskette drive and a Winchester drive.

1. Select the MODIFY SYSTEM MENUS utility from the System Utilities Menu.
2. When the initial utility screen appears, position the acceptance block next to the Edit Existing Menu option. Enter APPMENU.DAT in the Menu File Id field. Enter the letter A in the On Drive field. Press EXEC twice.
3. Add an entry to the Applications Menu for entering Transparent mode. To do this, press RETURN to move the acceptance block to the function selections. Select the Add New Entry option and press EXEC. Enter the line

Enter Transparent Mode

in the menu display. Press RETURN to move the cursor to the lower portion of the screen. Enter the following responses to the prompts:

File Name: PRNMODE
File Extension: COM
Parameters: 1
Module type: (position acceptance block next to Program)

Press EXEC after you enter these responses.

4. Add an entry to the Applications Menu for exiting Transparent mode. To do this, press RETURN to move the acceptance block to the function selections. Select the Add New Entry option and press EXEC. Enter the line

Exit Transparent Mode

in the menu display. Press RETURN to move the cursor to the lower portion of the screen. Enter the following responses to the prompts:

File Name: PRNMODE
File Extension: COM
Parameters: 0
Module type: (position acceptance block next to Program)

Press EXEC after you enter these responses.

5. Press CANCEL. The following prompt appears on the screen:

```
Press EXECUTE to update the menu definition file
or CANCEL to return to menu without updating file.
WARNING - FAILURE TO UPDATE MAY DAMAGE THE
INTEGRITY BETWEEN THE MENU DEFINITION AND HELP
TEXT FILES.
```

When this message appears, press EXEC. The process of adding these entries to the Applications Menu is then complete.

In order for the Transparent Mode utility to be functional, a printer driver must be installed in the file CONFIG.SYS. If you attempt to turn transparent mode on in a system that does not have a printer driver installed, the message "Function was not completed" appears on the screen, and the system returns to the Applications Menu.

Applications programmers should consider the option of selecting transparent mode dynamically. To do so, create an assembly language applications program which executes an interrupt type 21h (function request). Refer to The Wang Professional Computer Program Development Guide and The Wang Professional Computer Assembly Language Reference Manual for information on how to write, assemble, link, and store an assembly language applications program. Prior to executing the interrupt type 21h, the registers must be set as follows:

```
AH      44h (function number)
AL      03h (subfunction code)
BX      04h (file handle)
CX      01h (count)
DS:DX   buffer address of the transparent mode command byte:
          FCh  enter transparent mode
          FBh  exit transparent mode
```

I.2 USING THE PRINTER SUPPORT EDITORS

The Printer Support Editors modify the system software to operate with your printer. The Printer Support Editors consist of three utilities.

- Printer Function Table Editor -- This utility allows you to create new printer function tables that contain the hardware interface functions and escape codes for your printer. For printer tables that support a serial driver, you can also specify parameters such as baud rate, parity, data bits, and number of stop bits.
- Character Translate Table Editor -- This utility allows you to create new character translate tables which relocate PC WISCII character positions to the font position in which they are found for your printer's font table. This utility also lets you specify single and double overstrike characters as well as ESC (escape) code characters and SO (shift out)/SI (shift in) character access.

- Printer Index Table Editor -- This utility modifies PRNXLT.COM, which contains the file names of the printer tables and the character translate tables. This file can also specify that the system automatically load a character translate table during start-up. When the system starts, the printer driver programs (PAR1DRVR.COM and SER1DRVR.COM) load PRNXLT.COM and the printer tables and character translates tables specified within PRNXLT.COM.

The sections below provide step-by-step procedures for using these three utilities.

I.2.1 The Printer Function Table Editor

The Printer Function Table Editor utility allows you to edit an existing printer function table or to create a new printer function table if you are not using one of the Wang-supported printers. With this utility, you can specify the hardware interface functions and escape codes for your printer table. You then save this printer table on System Diskette I and enter the name of this table in PRNXLT.COM using the Printer Index Table Editor utility described in Section I.2.3.

To access this utility, select the Printer Function Table Editor option from the Printer Support Menu shown in Figure I-1. The Printer Function Table Menu in Figure I-2 appears.

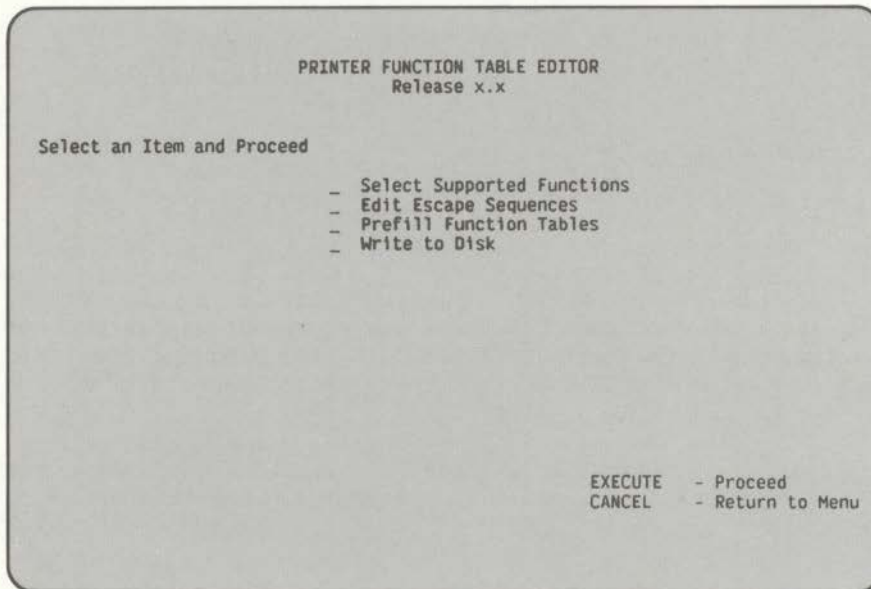


Figure I-2. The Printer Function Table Menu

The process of editing or creating a printer table consists of the following steps, which are described in more detail below:

- Prefill an existing printer table. This step is not necessary if you are creating a new printer table.
- Enter the hardware interface functions your printer supports.
- Enter the escape sequences for your printer (not required if your printer supports the Transparent Mode function).
- Save the printer table file on System Diskette I.

Prefilling an Existing Table

To edit an existing printer function table, select the Prefill option from the Printer Function Table Editor Menu. If you are creating a new printer table, skip this section and proceed to the section on Entering Hardware Interface

Functions or Editing Escape Sequences. When you select Prefill, the prompt "Enter name of file to edit" appears underneath the menu. Enter the name of the printer table file you want to edit and press EXEC. This file name must have the printer table file name extension .PDT. If you enter a file name that does not have this extension and press EXEC, the message "Invalid data: Suffix .PDT required" appears at the bottom of the screen. Reenter the file name with a .PDT extension and press EXEC. If you misspell the file name or enter a nonexistent file name, the message "File Not Found" appears at the bottom of the screen. You must then reenter a correct file name.

After you press EXEC, the file name prompt disappears. While the utility is prefilling the printer table, the message "Reading from disk" appears in the lower left corner of the screen. When prefill is complete, the message "Task Complete" appears. Press CANCEL to return to the Printer Support Menu.

Entering Hardware Interface Functions

To edit the hardware interface functions in a printer table, first select the Supported Functions option from the Printer Function Table Menu. A screen similar to the one shown in Figure I-3 appears.

```

PRINTER FUNCTION TABLE EDITOR
Select Supported Functions

Does this printer table support a serial printer driver? (Yes/No) N

Select Supported Functions:

- 80 Character Per Line
- Audible Tone
- Transparent Mode
- Reset Printer
- Set Horizontal Spacing
- Proportional Spacing
- Power-on Communications Test
- Set Form Length
- Set Line Feed Spacing
- Printer Deselect &
  Idle Status Request

EXECUTE - Proceed
CANCEL - Return to Menu
  
```

Figure I-3. Supported Functions Screen

The first prompt in the display asks if the printer table you are creating supports a serial printer driver. Enter a Y or an N in the field and press RETURN or BACK TAB to move the cursor to the list of functions. If you enter an invalid character and attempt to leave the field, the utility keeps the cursor in that field and displays the message "Invalid data: Y or N required." You must then enter a Y or an N before moving to the next field.

From the list of functions, specify those that your printer supports. To select a function, use the space bar and BACKSPACE keys to move the cursor next to the function and press INSERT. The utility indicates that you have selected a function by placing an acceptance block next to that function. The utility then moves to the next function in the list.

The utility has no way to verify that you are entering the correct information about your printer. In particular, there are several items that you must check in detail to ensure that they are supported by the Wang PC. These items and their requirements are listed below (other items in Supported Functions do not have such exact requirements as those listed below). You must enter these printer functions exactly as listed below. If these functions are not supported in the exact manner described below, then your printer cannot be used with the PC. Consult your printer reference manual if you are not sure which functions in the list apply to your printer.

<u>Function</u>	<u>Requirements</u>
Printer Deselect and Idle Status Request (serial printers only)	The escape sequence for the idle status must be defined by three bytes. The status byte returned by the printer must be preceded by STX(02h). The idle status bit must be represented as 1=idle and 0=busy. The deselect function must be preceded by DC3(13h). The printer must return an XOFF upon receiving the deselect sequence.
Reset Printer (serial printers only)	If the printer supports an XON after reset, the reset function must be followed by DC1(11h).
Proportional Spacing	Backspace, Perform Negative Line Feed, Perform Half Line Feed, and Perform Negative Half Line Feed functions are supported by Proportional Spacing only. Horizontal tab stops are not supported.

Horizontal Tab Stops	Supported at every eighth character position (not supported in Proportional Spacing). Vertical tabs are not supported.
Left Margins	Supported for half- and full-inch intervals.
Attributes	The generalized printer driver programs support the attributes superscript, subscript, bold, underline, and double underline. Even if your printer supports these attributes, do not include the escape sequences in the printer function table. The printer driver programs handle them automatically.
Terminator Hex Code FE	Cannot be used in any escape sequence.

If you want to deselect a function, position the cursor next to the function you want to deselect and press DELETE. The utility indicates that you have deselected the function by removing the acceptance block that appeared next to that function. The utility then moves to the next function in the list.

To move the cursor from the list of functions to the initial prompt in the display, press BACK TAB or RETURN. If you press BACK TAB or RETURN again, the utility returns to the function you last edited.

If you do not want to save the changes you have made to this screen, press CANCEL. The utility disregards all changes you have made and returns to the Printer Function Table Menu.

When you finish selecting the functions on the first screen that apply to your printer, press EXEC. If the printer table you are editing or creating does not support a serial printer driver (that is, if you entered an N in response to the first prompt in the screen), the utility saves your changes and returns to the Printer Function Table Menu. If the printer table you are editing or creating supports a serial printer driver (that is, if you entered a Y in response to the first prompt in the screen), another screen appears. (Refer to Figure I-4.)

```

                                PRINTER FUNCTION TABLE EDITOR
                                Select Supported Functions

Select Baud Rate:  - 50          - 150          - 1200          - 4800          - 19.2 k
                   - 75          - 200          - 1800          - 7200          - 56 k
                   - 100         - 300          - 2400          - 9600          - 1.344m
                   - 110         - 600          - 3600          - 16 k          - 1.544m
                   - 134.5

Select Parity:      - No Parity
                   - Odd Parity
                   - Even Parity

Select Stop Bits:   - 1.0 Stop Bits
                   - 1.5 Stop Bits
                   - 2.0 Stop Bits

Select Data Bits:   - 5 Data Bits
                   - 6 Data Bits
                   - 7 Data Bits
                   - 8 Data Bits
                   - 9 Data Bits

                                EXECUTE  - Proceed
                                CANCEL   - Previous Screen

```

Figure I-4. Serial Printer Supported Functions Screen

This screen contains sections in which you specify the baud rate, parity, number of data bits, and number of stop bits for your printer. (Refer to your printer reference manual or The Wang Professional Computer Asynchronous Communications Guide for an explanation of these items.) To select an option from a section of this table, use the space bar and BACKSPACE keys to move the cursor next to the option you want. The utility indicates the options currently selected in each section by highlighting them; these options also have an acceptance block next to them. To move the cursor to another section of the screen, press RETURN or BACK TAB.

NOTE:

Although your printer may support a number of serial options, the Wang PC hardware may not. Check The Wang Professional Computer Technical Reference Manual for a full description of each hardware component to determine specifically how your printer can be supported by the Wang PC.

To select an item different from the highlighted item, use the space bar to move the cursor to the correct item. Then press RETURN or BACK TAB to advance to the next section. After you select the items in each section that apply to your printer, press EXEC to indicate that you want the utility to save your changes. The utility does so and returns you to the Printer Function Table Editor Menu. If you press CANCEL while in the Supported Functions screen #2, the utility disregards any changes you made in this screen and returns to the first Supported Functions screen. The first screen, however, reflects any changes you made to it before you entered the second screen. If you press SHIFT + CANCEL while in the second Supported Functions screen, the utility cancels all changes you made in both screens and returns to the Printer Function Table Editor screen.

Editing Escape Sequences

After you edit the hardware interface functions for your printer with the Supported Functions screen, the next step is to edit the escape sequences. To do this, select the Escape Sequences option from the Printer Function Table Editor Menu. When you select this option, a screen similar to the one shown in Figure I-5 appears.

PRINTER FUNCTION TABLE EDITOR
Edit Escape Sequences

Enter Escape Codes for Functions:

Audible Tone _____	Status Request _____
Reset Printer _____	Deselect Printer _____
Backspace _____	Half Line Feed _____
Neg. Line Feed _____	Neg. Half Line Feed _____
Set Form Length _____	
Set Line Feed Spacing _____	
Set Horizontal Spacing _____	

EXECUTE - Proceed
CANCEL - Return to Menu

Figure I-5. Escape Sequences Screen #1

NOTE:

If you selected the Transparent Mode option when you edited the printer functions in the previous step, the Escape Sequences option is not functional. If you select the Transparent Mode option and then attempt to access the Escape Sequences option, the message "Transparent mode: Escape sequences not needed" appears in the lower left corner of the screen. If this is the case, skip this section and proceed directly to the Write to Disk option, as described in the next section.

The prompts in this screen contain either a blank in which you enter the escape code for the corresponding function on your printer or the word UNAVAILABLE. This word appears if you indicated that this function does not apply to your printer while you were in the first Supported Functions screen. For example, if you did not select the Reset Printer option in the first Supported Functions screen, the word UNAVAILABLE appears next to the Reset Printer line on the first Escape Sequences screen.

When this screen appears, enter the escape code hex values for each function your printer supports. Press the RETURN key or BACK TAB key to move the cursor to the next or previous field in the display. After you enter the escape codes for the first screen, press EXEC to go to the second Escape Sequences screen, shown in Figure I-6.

PRINTER FUNCTION TABLE EDITOR
Edit Escape Sequences

Enter Hex Codes for Form Length:

_____ 11 inch	_____ 12 inch
_____ 14 inch	_____ 15 inch

Enter Hex Codes for Line Feed Size:

_____ 48 lpi	_____ 24 lpi	_____ 12 lpi
_____ 8 lpi	_____ 6 lpi	_____ 4 lpi
_____ 3 lpi	_____ 2 lpi	

EXECUTE - Proceed
CANCEL - Previous Screen

Figure I-6. Escape Sequences Screen #2

NOTE:

While the utility verifies that your entries contain only hex characters (the message "Invalid data: must be hex values" appears if they do not), it cannot verify that the escape codes are correct for the functions on your printer. Consult your printer reference manual if you are not sure of the correct hex code for a given printer function.

The Escape Sequences screen #2 contains fields in which you enter the hex codes for your printer that represent the Form Length and Line Feed Size options shown in the screen display. If you indicated in the first Supported Functions screen that your printer did not support the functions of Set Form Length or Set Line Feed Spacing, the fields for the corresponding sections of the second Escape Sequences screen contain the word UNAVAILABLE. Enter the hex codes in the fields for each option your printer supports, using RETURN and BACK TAB to move the cursor between fields.

If you selected the Printer Deselect and the Idle Status Request in the first Supported Functions screen, the bottom of the second Escape Sequences screen includes a section in which you specify the idle bit position that corresponds to your printer. (The idle bit position prompt does not appear if you did not select this option.) Use the space bar and BACKSPACE keys to position the cursor and the acceptance block next to the idle bit position that corresponds to your printer. (The utility highlights the currently selected bit position.)

After you enter the data that applies to your printer, press EXEC to proceed to the third Escape Sequences screen shown in Figure I-7.

```

                                PRINTER FUNCTION TABLE EDITOR
                                Edit Escape Sequences

Enter Hex Codes for the Horizontal Spacing:

_____ 5 cpi      _____ 10 cpi      _____ 12 cpi
_____ 15 cpi     _____ 16.5 cpi

Enter Hex Codes For Proportional Spacing:

_____ Select Proportional Spacing
_____ Deselect Proportional Spacing

                                EXECUTE - Proceed
                                CANCEL  - Previous Screen

```

Figure I-7. Escape Sequences Screen #3

This screen contains sections that prompt you to enter your printer's hex codes for five horizontal spacing settings and to enter the hex codes for selecting or deselecting proportional spacing. The fields that follow these prompts are blank if you selected the Set Horizontal Spacing and Proportional Spacing functions on the first Supported Functions screen. If you did not select one or both of these functions, the corresponding fields in the third Escape Sequences screen contain the word UNAVAILABLE.

The procedure for filling in the hex codes in this screen is the same as for the previous two Escape Sequences screens. Use RETURN or BACK TAB to move the cursor between fields, then enter the escape codes that correspond to the functions for your printer. As in the other screens, the utility checks to see that you have entered only hex characters in these fields, but cannot verify that the escape codes you enter are correct for a given function on your printer.

After you enter all the escape codes on all three screens that are applicable for your printer, press EXEC to have the utility save the changes that you have made. The utility then returns to the Printer Function Table Editor Menu. Pressing CANCEL from the first Escape Sequences screen also returns to the Printer Function Table Editor Menu; however, the utility disregards any changes you made to that screen. Pressing CANCEL from the second or third Escape Sequences screen returns to the previous Escape Sequences screen. The utility disregards any changes you made to the screen in which you pressed CANCEL, but the screen you return to still contains any changes you have made. Pressing SHIFT + CANCEL from any screen brings you back to the Printer Function Table Editor Menu and cancels the changes you made to all Escape Sequences screens.

Saving the Printer Table

When you press EXEC to leave the Supported Functions or Escape Sequences screens, the Printer Function Table Editor utility retains any changes you have made in a buffer portion of memory. However, to save these changes on disk, you must select the Write to Disk option from the menu.

After you select the Write to Disk option and press EXEC, a prompt appears that requests you to enter the name you want to give to the printer table file. You must enter a legal Wang PC file name that contains the extension .PDT; the message "Invalid data: Suffix .PDT required" appears if you use an extension other than .PDT. The new printer table file should be on System Diskette I so that it is available when you start the system. Therefore, you should insert System Diskette I in the default drive (if it is not there already) before you execute the Write to Disk option. After you enter the file name, press EXEC. The utility displays the message "Writing to disk" in the lower left corner of the menu as it saves the file. If you enter the name of a file that exists on the disk, the utility displays the message "File already exists: Press EXECUTE or CANCEL." If you want to overwrite the existing file, press EXEC. If you do not want to overwrite the existing file, press CANCEL. When you press CANCEL, the message disappears and the file name prompt remains on the screen.

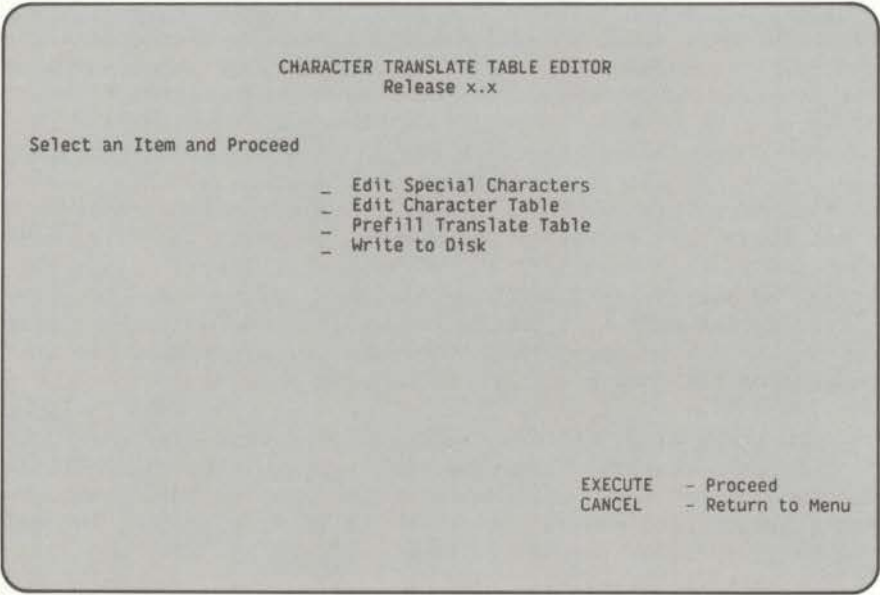
When you press EXEC, the file name prompt disappears. After the utility saves the file, the message "Task Complete" appears. Press CANCEL to return to the Printer Support Menu. If you press CANCEL from the Printer Function Table Editor Menu before you select the Write to Disk option, the utility returns to the Printer Driver Editor Menu and does not save any changes you made to the printer table file.

After you edit or create a printer table file, you should enter the printer table file name in PRNXLT.COM using the Printer Index Table Editor. This enables the printer driver to load the printer table automatically during start-up. Section I.2.3 provides procedures for using this utility.

I.2.2 The Character Translate Table Editor

The Character Translate Table Editor utility allows you to edit an existing character translate table or to create a new character translate table for both the daisy printer and the matrix printer. With this utility, you can specify the location of PC WISCII character positions in a printer font table. You can also specify single and double overstrike characters. After you save the character translate table on disk, enter the name of this table in PRNXLT.COM, using the Printer Index Table Editor described in Section I.2.3. You can also specify that the system load this table automatically during system start-up.

To access the Character Translate Table Editor utility, select it from the Printer Support Menu. The menu in Figure I-8 appears.



```
CHARACTER TRANSLATE TABLE EDITOR
Release x.x

Select an Item and Proceed

- Edit Special Characters
- Edit Character Table
- Prefill Translate Table
- Write to Disk

EXECUTE - Proceed
CANCEL - Return to Menu
```

Figure I-8. The Character Translate Table Menu

The process of editing or creating a character translate table consists of the following steps, which are described in detail in later sections:

- Prefill an existing character translate table. This step is not necessary if you are creating a new table
- Specify up to 15 first overstrike characters and 15 second overstrike characters
- Enter the hex codes of the printer characters and their overstrike attributes in the character table
- Enter ESC code characters
- Select Shift Out/Shift In (SO/SI) character access
- Save the character translate table file on disk

Prefilling an Existing Table

To prefill an existing printer table, select the Prefill option from the Character Translate Table Menu. If you are creating a new character translate table, skip this section and proceed to the next section. When you select Prefill, the prompt "Enter name of file to edit" appears underneath the menu. You then enter the name of the character translate table file, for example PM010vl.CTT, you want to edit and press EXEC. This file name must have the character translate table file name extension .CTT. If you enter a file name that does not have this extension and press EXEC, the message "Invalid data: Suffix .CTT required" appears at the bottom of the screen. Reenter the file name and press EXEC. If you misspell the file name or enter a nonexistent file name, the message "File Not Found" appears at the bottom of the screen. You must then reenter a correct file name.

When you press EXEC, the file name prompt disappears. While the utility is prefilling the printer table, the message "Reading from disk" appears in the lower left corner of the screen. When prefill is complete, the message "Task Complete" appears, and the utility returns to the Character Translate Table Menu.

NOTE:

You could create a new table by using this technique and change those items of the existing table that are different. Then, save the modified table under a new name.

Specifying the Overstrike Characters

When you select the Edit Special Characters option from the Character Translate Table Menu, a screen similar to the one shown in Figure I-9 appears.

```

CHARACTER TRANSLATE TABLE EDITOR
Edit Special Characters

Enter the WISCII Values for the Overstrike Characters

1st Overstrikes   1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
                  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
2nd Overstrikes   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Enter the WISCII Values of the Escape(ESC) Code Characters

                  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
                  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Is Shift Out/Shift In Character Access Supported? (Yes/No) N

EXECUTE  - Proceed
CANCEL   - Return to Menu

```

Figure I-9. Overstrike Characters Screen

Overstrike characters are characters that a printer prints over a pre-existing character to form a new character. For example, when a printer overstrikes a vertical bar on an S, it forms a dollar sign. You can specify up to 15 WISCII characters as first overstrike characters and up to 15 characters as second overstrike characters (characters that overstrike a first overstrike character). You specify a character for use as an overstrike character by entering its corresponding hex value in the appropriate field on the screen display. (Refer to Appendix D for a list of hex codes for the entire WISCII character set.)

The RETURN and BACK TAB keys enable you to move the cursor from field to field within the display. If you enter an invalid hex value in a field and attempt to move from that field, the utility displays the message "Invalid data: must be hex values." The utility does not let you move the cursor from that field until you enter a valid hex code.

After you enter your first and second overstrike characters, press EXEC to tell the utility you want to save these entries. The utility then saves this information and returns to the Character Translate Table Menu. If you press CANCEL while in the Overstrike Characters screen, the utility ignores any changes you made to that screen and returns to the Character Translate Table Menu.

Entering the Printer Character Locations

To enter the printer character locations, you specify the hex code that corresponds to the font position on your print wheel for each character in the WISCII character set. Section I.2.4 includes a more detailed description of how to locate the font positions on a print wheel. If your print wheel does not include a given character, you may be able to form this character by specifying one or two overstrike characters.

To begin this process, select the Edit Character Table option from the Character Translate Table Menu. A screen similar to the one shown in Figure I-10 appears.

```

CHARACTER TRANSLATE TABLE EDITOR
Edit Character Table

1st Overstrike      1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
2nd Overstrike
ESC Code Characters

--0--1--2--3--4--5--6--7--8--9--A--B--C--D--E--F
2  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
   + + + + + + + + + + + + + + + + + + + + + +
3  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
   + + + + + + + + + + + + + + + + + + + + + +
4  _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
   + + + + + + + + + + + + + + + + + + + + + +
   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Enter Position of Overstrike Characters:      1st 0      2nd 0

SHFTNORTH - Character Field      NORTH - Scroll Down      EXECUTE - Proceed
SHFTSOUTH - Overstrike Field     SOUTH - Scroll Up       CANCEL - Return to Menu

```

Figure I-10. Character Table Screen

This initial display is one of five such screens that represent the entire WISCII character table. The first screen accommodates characters with hex codes 20 through 4F. The second screen holds characters from hex 50 to 7F. The third screen contains characters from hex 80 to AF. The fourth screen includes characters from hex B0 to DF. The last screen holds characters from hex E0 to FF. You press the South cursor control key to go to the next screen display and the North cursor control key to return to the previous screen display. The top half of each display also lists the first and second overstrike characters you specified in the previous step.

The first digit of a WISCII character's hex code appears at the left of the row. The second digit appears at the top of the column. For example, the upper left field in the initial display represents the WISCII character hex 20. For each field in the screen displays, you enter the hex code of the font position on your print wheel for the corresponding WISCII character.

To specify overstrikes for a character, press SHIFT and the South cursor control key simultaneously after you enter the hex code. This moves the cursor to the first overstrike character prompt. (These prompts appear directly underneath the WISCII character table.) From the overstrike list at the top of the screen, enter the hex value position that corresponds to the character you want to use as a first overstrike. To specify a second overstrike, press RETURN after you enter the first overstrike to move the cursor to the second overstrike prompt. Then, enter the hex value position that corresponds to the character you want to use as a second overstrike. If you do not want a second overstrike character, insert a zero (0) in the second overstrike field if one is not already there. Press SHIFT + North cursor control key to move the cursor from the overstrike field you are in and return to the WISCII character table.

The RETURN and BACK TAB fields move the cursor from field to field in the WISCII character table displays. The utility displays the overstrike character hex values automatically for the character field the cursor is in.

If you enter a character other than a hex value for a field in the WISCII character table display or in response to an overstrike prompt, the message "Invalid data: must be hex values" appears in the lower left corner of the screen. The cursor also remains in the current field; the cursor cannot leave this field until you enter a valid hex value.

After you enter or edit the font position hex codes and overstrike characters for all five sections of the WISCII character table, press EXEC to have the utility accept the changes you have made. The utility then returns to the Character Translate Table Menu. If you press CANCEL at any time while you are in the Character Table screens, the utility returns to the Character Translate Table Menu and disregards any changes you made to the Character Table screens.

Entering Escape Code Character

First, you need to enter into the Edit Special Characters Table the WISCII values of the Escape Code Characters. The location of these entries determines the offset values you use in the Edit Character Table screen (the character you set in the Edit Special Characters Table automatically is displayed under the prompt ESC Code Characters in the Edit Character Table screen under the appropriate offset value). Then, you fill in this offset value into the position within the table that is the WISCII value of the ESC code character.

Selecting SO/SI Character Accesss

If you want to select the SO/SI Character Access, enter Y to the prompt on the Edit Special Characters screen. Then, you modify the ASCII values for each of the SO/SI characters. To modify this value, add 80h (hexadecimal) to the ASCII value of the character. Then, enter this modified value to the position in the Edit Character Table at the appropriate WISCII position.

Saving the Character Translate Table

When you press EXEC to leave the Overstrike Characters or Character Table options, the Character Translate Table utility retains any changes you have made in a buffer portion of memory. To save these changes on disk, you must select the Write to Disk option from the Character Translate Table Menu.

When you select the Write to Disk option and press EXEC, a prompt appears that requests you to enter the name you want to give to the character translate table file. You must enter a legal Wang PC file name that contains the extension .CTT; the message "Invalid data: Suffix .CTT required" appears if you use any other extension. After you enter the file name, press EXEC. When you press EXEC, the file name prompt disappears. The utility displays the message "Writing to disk" in the lower left corner of the menu as it saves the file. To load the new character translate table automatically at start-up time, you should save the .CTT file on System Diskette I. If you enter the name of a file that exists on the disk, the utility displays the message "File already exists: Press EXECUTE or CANCEL." If you want to overwrite the existing file, press EXEC. If you do not want to overwrite the existing file, press CANCEL. When you press CANCEL, the message disappears and the file name prompt remains on the screen.

The character translate table file must contain at least one character. If you attempt to write an empty file to disk, the message "Invalid data: Character table is empty" appears on the screen.

After the utility saves the file, the message "Task Complete" appears. Press CANCEL to return to the Printer Support Menu.

If you press CANCEL from the Character Translate Table Menu before you select the Write to Disk option, the utility returns to the Printer Support Menu and does not save any changes you made to the character translate table file.

After you edit or create a character translate table file, you may want to enter the character translate table file name in PRNXLT.COM. You can also specify that the system load this table automatically during system start-up. Section I.2.3 provides procedures for using the Printer Index Table Editor.

I.2.3 The Printer Index Table Editor

To access the Printer Index Table Editor, select the Printer Support option from the Main System Menu. Remove System Diskette I and insert System Diskette II. Then, select the Printer Index Table Editor option from the Printer Support Menu (refer to Figure I-1). The first Printer Index Table Editor screen appears. (Refer to Figure I-11.)

```

PRINTER INDEX TABLE
Release x.x

Printer Index Table is on Drive: A

Enter Printer Table Names      #1: _____ (parallel)
                                #2: _____ (serial)
                                #3: _____ (parallel or serial)
                                #4: _____ (parallel or serial)

                                EXECUTE - Proceed
                                CANCEL  - Previous Screen
  
```

Figure I-11. Printer Index Table Editor Screen #1

This screen includes a prompt that requests you to enter the drive that you want the printer index file to reside on. Enter a valid drive letter and press EXEC. Four prompts then appear in the bottom portion of the screen. These prompts contain by default the names of the printer tables that Wang supplies: PM010v2.PDT for the PC-PM010 parallel printer and PM012v2.PDT for the PC-PM012 serial printer.

This screen allows you to enter up to four printer table file names, two of which are reserved for future printer drivers. However, you need only enter the table file name(s) that correspond to your printer table(s). The first table name entry is for tables that support parallel printer drivers, the second is for tables that support serial printer drivers, and the third and fourth are for tables that support either parallel or serial printer drivers.

If you have either of the Wang-supported printers, you do not have to run this utility or modify this screen. If you have developed a printer table for another printer, then you have to enter the table's file name in this screen. If you have a parallel printer, you should enter the new printer table name in field #1, over the default PM010v2.PDT name. If you have a serial printer, then enter the new printer table in field #2 over the default PM012v2.PDT name. You do not have to delete the default printer table names that you are not using.

Entries for printer table file names must meet the requirements for valid Wang PC file names. (Refer to The Wang Professional Computer Utility Program Users Guide for information on Wang PC file names.) In addition, printer table file names must have the extension .PDT. If you enter a file name with an extension other than .PDT for a printer table entry, the message "Invalid data: Suffix .PDT required" appears at the bottom of the screen when you attempt to leave the field. The cursor remains in this field until you delete the file name or enter a file name with a .PDT extension.

After you enter a printer table name, press RETURN to move the cursor to the next field in the table. If you press BACKTAB after you enter a printer table name, the cursor moves to the previous field.

After you enter all the desired items on this screen, press EXEC. The second Printer Index Table Editor screen appears. (Refer to Figure I-12.)


```

      PRINTER INDEX TABLE EDITOR
    Character Translate Table Names

Enter Character Translate Table Names  #1: _____ (parallel)
                                         #2: _____ (serial)
                                         #3: _____ (parallel or serial)
                                         #4: _____ (parallel or serial)

Do you wish to load _____ at boot time? (Yes/No) N
Do you wish to load _____ at boot time? (Yes/No) N
Do you wish to load _____ at boot time? (Yes/No) N
Do you wish to load _____ at boot time? (Yes/No) N

                                         EXECUTE - Proceed
                                         CANCEL  - Previous Screen
  
```

Figure I-12. Printer Index Table Editor Screen #2

The upper portion of this screen contains by default the names of the character translate tables that Wang supplies: PM010v1.CTT for the PC-PM010 parallel printer and PM012v2.CTT for the PC-PM012 serial printer. The procedure for entering character translate table file names is almost identical to that for entering printer table file names. The only difference is that the required extension for character translate table file names is .CTT. If you enter a file name with an extension other than .CTT for a character translate table entry, the message "Invalid data: Suffix .CTT required" appears at the bottom of the screen when you attempt to leave the field. The cursor remains in this field until you enter a file name with a .CTT extension.

When you enter a new file name for a character translate table and leave that field, the utility replaces the default file name with the new .CTT name in one of the four "Do you wish to load _____ at boot time? (Yes/No)" prompts in the lower portion of this screen. To specify a Yes or No response to this prompt, use the RETURN and BACKTAB keys to move the cursor next to the prompt, and enter a Y or an N. If you enter a invalid character and attempt to leave the field, the utility keeps the cursor in that field and displays the message "Invalid data: Y or N required." You must then enter a Y or an N.

Press EXEC to save the changes you made. The utility saves your updated entries in PRNXLT.COM and returns to the Printer Support Menu. If you want to leave the Printer Index Table screen at any time without saving your changes, press CANCEL. The utility restores the original values and returns to the Printer Support Menu.

I.2.4 How To Determine a Daisy Wheel Layout

The Character Table option of the Character Translate Table Editor utility requires you to enter the hex code for the print wheel font position of each WISCII character. If you are not sure what characters are in font positions 20 through 7F of your print wheel, you can create a small character translate table file that can help you determine this. This procedure consists of the following steps:

STEP 1: Select the Character Translate Table option from the Printer Support Menu. Then select the Character Table option from the Character Translate Table Editor Menu. A screen similar to that shown in Figure I-10 appears.

STEP 2: Enter the hex values from 20 through 2F in the first row. Press RETURN after you enter each value to move the cursor to the next field. Enter the hex values from 30 through 3F in the second row, and from 40 to 4F in the third row. The screen should now look like the one in Figure I-13.

CHARACTER TRANSLATE TABLE EDITOR															
Edit Character Table															
1st Overstrike	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2nd Overstrike															
ESC Code Characters															
--0--	--1--	--2--	--3--	--4--	--5--	--6--	--7--	--8--	--9--	--A--	--B--	--C--	--D--	--E--	--F--
2 20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
3 30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
4 40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F

STEP 7: Restart your system to enable it to load your character translate table file.

STEP 8: After the Main System Menu appears, enter the BASIC interpreter by selecting Basic from the Program Development Menu. Write a short BASIC program (refer to The Wang Professional Computer BASIC Language Guide) that prints the characters from hex 20 through 7F. The BASIC program to use for parallel printers is as follows:

```

5 A = 32
10 FOR I = 1 TO 6
15     FOR J = 1 TO 16
20         LPRINT CHR$(A);
25         A = A + 1
30     NEXT J
35     LPRINT CHR$(10); CHR$(13)
40 NEXT I
45 LPRINT CHR$(12)
50 END

```

The BASIC program for serial printers is as follows:

```

5 REM 1200 baud, no parity, 8 data bits, 1 stop bit
10 OPEN "COM1:1200,n,8,1" AS #1
15 A = 32
20 FOR I = 1 TO 6
25     FOR J = 1 TO 16
30         PRINT#1, CHR$(A);
35         A = A + 1
40     NEXT J
45     PRINT#1, CHR$(10); CHR$(13)
50 NEXT I
55 PRINT#1, CHR$(12)
60 CLOSE#1
65 END

```

STEP 9: Make sure that your printer is connected and on line. Run your program. The six rows of output print a hard copy of characters in font positions 20 through 7F. The first row contains characters in font positions 20 through 2F, the second row contains those in positions 30 through 3F, and so on.

I.3 RAMDISK

RAMDISK is a Wang PC device driver that allows you to designate a portion of main memory for use as a high-speed disk. RAMDISK decreases access time to files that are stored on it. RAMDISK is the file RAMDISK.COM that is part of the system software. Because of the memory space requirements of the system software, RAMDISK is not usable unless your system is an expanded memory system (i.e., it has more than 128KB of memory).

To direct your system to use RAMDISK, you have to modify CONFIG.SYS (see the procedure for editing CONFIG.SYS in Section I.1). Then, each time you start your system, the RAMDISK is automatically loaded. There are two options for specifying the amount of memory you want to set aside for use as RAMDISK:

- specifying a fixed amount of memory
- specifying a percentage of available memory

You enter the line `DEVICE = RAMDISK.COM` as one of the last lines of CONFIG.SYS, followed by either the absolute amount of memory (in KB) or the percentage of memory you want (see below). The minimum amount of space that you can reserve with RAMDISK by either method is 32KB.

Fixed Memory Option

To specify a fixed amount of memory (in KB) as RAMDISK, include the letter F and the number of KB of memory you want at the end of the `DEVICE = RAMDISK.COM` line. For example, if you want a 156KB RAMDISK, the line within CONFIG.SYS should read

```
DEVICE = RAMDISK.COM F156
```

Percentage Memory Option

To designate a percentage of memory as RAMDISK, you specify the amount of memory that you do not want to be used for RAMDISK. This amount remains available for regular use. The amount of memory left over is then multiplied by the percentage you specify. The result of that multiplication is the amount designated as the RAMDISK space.

To the line `DEVICE = RAMDISK.COM`, add the letter R and the amount of reserved memory (in KB) you do not want to use as a RAMDISK, followed by the letter P and the percentage of the remaining memory you want to use as RAMDISK. For example, if you want to reserve 128KB of memory and use 60 percent of the remaining memory as a RAMDISK, add the following line to CONFIG.SYS:

```
DEVICE = RAMDISK.COM R128 P60
```

To specify PERCENT figures that occupy one or more decimal places, enter the PERCENT parameter as (100 * percentage). For example, to specify 70.31%, enter P7031.

The default value for the PERCENT parameter is 70.31%; the default value for the RESERVED parameter is 128KB. If you enter the line DEVICE = RAMDISK.COM without parameters, the system assumes a percentage calculation with the default values for the PERCENT and RESERVED parameters.

Using the RAMDISK

Once the RAMDISK has been established, you can use it as if it were another disk drive. Its drive designation is the next letter in the alphabet after the one the system last used as a drive designation. The only exception is if you have a single-diskette drive system; RAMDISK never uses a "B" drive designation. For example, if you have a single- or dual-drive system, the RAMDISK space would be referenced by "C." If your system has a Winchester drive (Drive C), the RAMDISK space would be "D." If your system has other device drives, then the RAMDISK uses the next available letter.

You work with the RAMDISK space using the same commands and utilities as you would with regular disk drive space. The only exception is that you cannot use DISK COPY with the RAMDISK space. You can copy files to the RAMDISK, execute files on it, erase files from it, and so on. One common use of RAMDISK is for copying frequently used operating files. The system can then load these files from the RAMDISK instead of from a diskette, thereby avoiding the need to change diskettes.

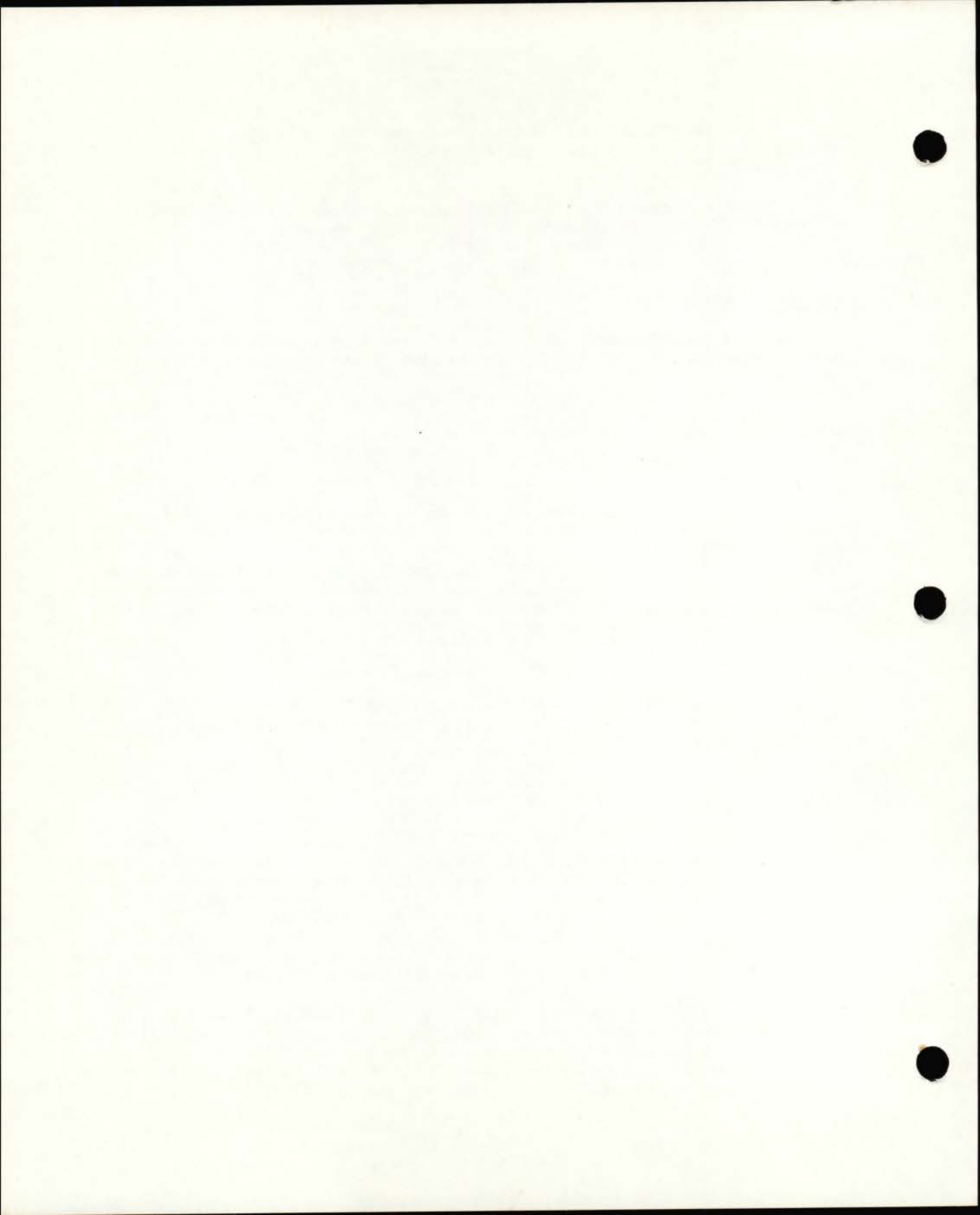
CAUTION:

All files on the RAMDISK are lost when you turn off the system. Therefore, if you want to save the files on RAMDISK, copy them to diskette before turning off the system.

Installing RAMDISK

To install RAMDISK, you modify CONFIG.SYS in a similar way as you would modify it for the generalized table-driven printer driver. Therefore, you can follow Steps 1 through 11 of the procedure for installing the printer driver. (Refer to Section I.1.) However, in Step 8, the line you add is one of the two described above for specifying memory space allocation for RAMDISK. If your CONFIG.SYS file also contains "DEVICE =" statements for the generalized printer driver (or other device driver, when available), your RAMDISK statement could precede or follow the printer driver statements.

After the RAMDISK has been loaded, the system displays the message "RAMDISK v 1.01 nnnnK allocated" to inform you how much space is now available as RAMDISK. If you have allocated too little or too much space, a message indicating the problem is displayed. If such a message appears, you should immediately modify the RAMDISK space specification in CONFIG.SYS.



APPENDIX J CUSTOMIZING THE SYSTEM SOFTWARE

If you use your Wang PC for one or two applications exclusively (Word Processing, for example), you will probably find it inconvenient to remove System Diskette I and insert your application diskette each time you want to use your application, and to remove your application diskette and insert System Diskette I each time you exit the application. You can eliminate this inconvenience by making a copy of System Diskette I, deleting any unnecessary files from the copy, and then copying the application files onto it. This appendix provides a step-by-step explanation of how to perform this process. You should read the entire procedure at least once before you try to perform it.

NOTE:

Make sure that your versions of the operating system and the application are compatible before you begin this process. For example, to run PC Word Processing, Version 1.1, you need a diskette with Version 1.1 of the system software on it.

STEP 1: Make at least two copies of System Diskette I using the DISK COPY utility, as explained in Section 3.5. Remove the original System Diskette I from Drive A. Insert a new copy of System Diskette I in Drive A. Perform all subsequent steps in this process on a new copy. Save the original and any other new copies of System Diskette I in case your first copy is lost or damaged.

STEP 2: Delete any unnecessary files from your first copy of System Diskette I using the FILE DELETE utility. (Refer to The Wang Professional Computer Utility Programs User Guide for instructions on how to use this utility.) Table J-1 shows a list of the files on System Diskette I and the function of each. This table also indicates how essential a particular file is. The letter Y in the "Delete?" column indicates that you can delete the file and not hinder the normal operation of the system. An N indicates that you should not delete the file. An asterisk indicates that you can delete the file if you need more room on your diskette for your application; you should, however, delete all Y files first. When a number appears in the "Delete?" column instead of a Y, N, or asterisk, refer to the comment with that number in the list following the table.

For example, if your Wang PC has a parallel printer and you do not need the following files:

- Help screens
- serial printer files
- the Program Development and Communications menus

you should run the FILE DELETE utility five times -- once with each of the following items as the File ID entry:

.HLP PM012. SER1DRVR.COM PRGDVMEN.* TCMENU.*

STEP 3: Run the DIRECTORY DISPLAY utility for your revised copy of System Diskette I. After the list of files appears on the screen, a message also appears telling you how many bytes are free on the diskette. Record this number.

STEP 4: Run the DIRECTORY DISPLAY utility again for your application diskette. The entry for each file contains the number of bytes that file occupies. Calculate the number of bytes needed for the application files you want to copy onto System Diskette I. (Keep in mind that you may not need to copy all application files; for example, you may not need files such as Help screens and sample documents.) Compare the number of bytes you need to the free space on your copy of System Diskette I. If the application files occupy fewer bytes than the free space on your copy of System Diskette I, you can proceed with Step 5. If not, you must delete more files from your copy of System Diskette I. (These files cannot be files that Table J-1 indicates with an N in the "Delete?" column.)

STEP 5: Insert your copy of System Diskette I in Drive A and your application diskette in Drive B. Return to the System Utilities Menu and select the FILE COPY utility. (Refer to The Wang Professional Computer Utility Programs User Guide for instructions on how to use this utility.) Copy the application files you want to have on your copy of System Diskette I.

For example, to copy the five Multiplan files, make the following entries on the FILE COPY utility screen:

- Input File -- Drive: B; (Volume ID entry not needed); File ID: MP.*
- Output File -- Drive: A; press EXEC to accept default for File ID

If you want to copy Wang PC Word Processing (WP.EXE) and the Word Processing functions (files on the Word Processing diskette with the extension .WPS) to System Diskette I, you must run FILE COPY twice. The first time, use the following entries:

- Input File -- Drive: B; (blank Volume ID); File ID: WP.EXE
- Output File -- (Same as above, except Drive is A.)

The second time, use the following entries:

- Input File -- Drive: B; (blank Volume ID); File ID: *.WPS
- Output File -- (Same as above, except Drive is A.)

Follow a similar procedure to copy the files for other applications onto System Diskette I.

NOTE:

The message "Diskette full" appearing during the copying process indicates that there is not enough room on System Diskette I for the file(s) you want to copy onto it. Return to Step 2 and delete more files from System Diskette I to provide additional space for your application files.

STEP 6: Restart your system as instructed in Section 3.3. Try to access the application with your modified copy of System Diskette I in Drive A. If you are able to access and use your application without changing diskettes, you have performed this procedure correctly.

Table J-1. Files Contained on System Diskette I

File Name	Delete?	Description
BIOS.SYS	N	Basic I/O System
MSDOS.SYS	N	Disk Operating System
CONFIG.SYS	N	Standard Configuration File (for MENU.COM)
CONFIG.SAV	N	Modified Configuration File (for COMMAND.COM)
COMMAND.COM	N	Command Processor
MENU.COM	N	Menu Display Program
MENUDRV.R.COM	N	Loader for MENU.COM and Files Called from Menus
UTILITY.MSG	N	System Utilities Messages
MENU.MSG	N	Date and Time Screen and Menu Messages
UTILITY.DAT	N	Utility Menu Data for MENU.COM
MENU.DAT	N	Main Menu Data for MENU.COM
APPMENU.DAT	N	Applications Menu Data for MENU.COM
PRGDVMEN.DAT	Y	Program Development Menu Data for MENU.COM
TCMENU.DAT	Y	Communications Menu Data for MENU.COM
APPMENU.HLP	Y	Applications Menu Help Screens
MENU.HLP	Y	Main Menu Help Screens
TCMENU.HLP	Y	Communications Menu Help Screens
PRGDVMEN.HLP	Y	Program Development Menu Help Screens
UTILITY.HLP	Y	System Utilities Menu Help Screens
RAMDISK.COM	*	RAMDISK
PRNXLT.COM	1	Program that loads printer tables and character translate tables (refer to Appendix I)
SER1DRV.R.COM	3	Generalized serial printer driver
PAR1DRV.R.COM	2	Generalized parallel printer driver
PM010.CTT	3	Serial printer character translate table
PM012.CTT	2	Parallel printer character translate table
PRINTMNU.DAT	1	Printer Support Menu Data for MENU.COM
RDIR.EXE	1	Print Redirection Utility
EDPDT.EXE	1	Printer Function Table Editor
EDCTT.EXE	1	Character Translate Table Editor
PRINTMNU.HLP	Y	Printer Support Menu Help Screen
CHAR.MSG	1	Character Translate Table Editor Messages
PRTAB.MSG	1	Printer Function Table Editor Messages
ERRSCR.MSG	1	Printer Driver Editor Error Messages
PM010.PDT	3	Serial Printer Function Table
PM012.PDT	2	Parallel Printer Function Table

Table J-1 Comments:

1. This file is necessary only if your system has a printer.
2. This file is necessary only if your system has a parallel printer.
3. This file is necessary only if your system has a serial printer.

APPENDIX K
CONTENTS OF SYSTEM DISKETTES I AND II

The following tables list the files found on System Diskettes I and II and the function of each file.

Table K-1. Files Contained on System Diskette I

File Name	Description
BIOS.SYS	Basic I/O System
MSDOS.SYS	Disk Operating System
CONFIG.SYS	Standard Configuration File (for MENU.COM)
CONFIG.SAV	Modified Configuration File (for COMMAND.COM)
COMMAND.COM	Command Processor
MENU.COM	Menu Display Program
MENUDRVR.COM	Loader for MENU.COM and Files Called from Menus
UTILITY.MSG	System Utilities Messages
MENU.MSG	Date and Time Screen and Menu Messages
UTILITY.DAT	Utility Menu Data for MENU.COM
MENU.DAT	Main Menu Data for MENU.COM
APPMENU.DAT	Applications Menu Data for MENU.COM
PRGDVMEN.DAT	Program Development Menu Data for MENU.COM
TCMENU.DAT	Communications Menu Data for MENU.COM
APPMENU.HLP	Applications Menu Help Screens
MENU.HLP	Main Menu Help Screens
TCMENU.HLP	Communications Menu Help Screens
PRGDVMEN.HLP	Program Development Menu Help Screens
UTILITY.HLP	System Utilities Menu Help Screens
RAMDISK.COM	RAMDISK
SER1DRVR.COM	Generalized serial printer driver
PAR1DRVR.COM	Generalized parallel printer driver
PM010.CTT	Serial printer character translate table
PM012.CTT	Parallel printer character translate table
PRINTMNU.DAT	Printer Support Menu data for MENU.COM
RDIR.EXE	Print Redirection Utility
EDPDT.EXE	Printer Function Table Editor
EDCTT.EXE	Character Translate Table Editor
PRINTMNU.HLP	Printer Support Menu Help Screen
CHAR.MSG	Character Translate Table Editor Messages
PRTAB.MSG	Printer Function Table Editor Messages
ERRSCR.MSG	Printer Driver Editor Error Messages
PM010.PDT	Serial Printer Function Table

Table K-1. Files Contained on System Diskette I (continued)

File Name	Description
PM012.PDT PRNXLT.COM	Parallel Printer Function Table Program that loads printer tables and character translate tables (refer to Appendix I)

Table K-2. Files Contained on System Diskette II

File Name	Description
DAISY06	Character Set Table for Daisy Printer
DW20DRVR.COM	DW20 Printer Driver
BASIC.EXE	Interpretive BASIC
PCEDIT.EXE	Wang PC Text Editor
WPCNVDOC.COM	Convert Document to Text File Conversion Aid
WPCONV.COM	Convert Text File to Document Conversion Aid
CONFIG.EDT	Default Parameter Values for Editor
CONVRSRC.WPS	WP Document to Text Conversion Messages
CONVTEXT.WPS	Text to WP Document Conversion Messages
CHKDSK.COM	CHECK DISK Utility
FORMAT.COM	DISK FORMAT Utility
PRINT.COM	Print Spooler Utility
WANGCOPY.EXE	FILE COPY Utility
WANGCOPY.MSG	FILE COPY Utility Messages
WANGCOPY.HLP	FILE COPY Utility Help Screens
WCOMPARE.COM	FILE COMPARE Utility
WCOMPARE.MSG	FILE COMPARE Utility Messages
WCOMPARE.HLP	FILE COMPARE Utility Help Screens
WDSKCOPY.COM	DISK COPY Utility
SSRPORT.COM	RS-232 Communications Port Configuration Program
SSRPORT.MSG	RS-232 Communications Port Configuration Program Messages
SSRPORT.HLP	RS-232 Communications Port Configuration Program Help Screens
MENUICMP.EXE	Menu Editor
MENUICMP.MSG	Menu Editor Messages
INDEX.MSG	Printer Index Table Editor Messages
ERRSCR.MSG	Printer Driver Editor Error Messages
PRNXLT.COM	Program that loads printer tables and character translate tables (refer to Appendix I)
EDPRNXLT.EXE	Printer Index Table Editor

APPENDIX L PRINTER PORT PIN ASSIGNMENTS

Wang supports both parallel and serial interfaces. Cables for parallel printers should be connected on all 36 pins. Tables L-1 and L-2 list the pin assignments for parallel and serial printers; your printer should meet the specifications listed in these tables.

Table L-1. Parallel Port Pin Assignments

Pin Number (+,-)	Signal	I/O
1,19	/DSTB IN	O
2,20	DATA 1	I/O
3,21	DATA 2	I/O
4,22	DATA 3	I/O
5,23	DATA 4	I/O
6,24	DATA 5	I/O
7,25	DATA 6	I/O
8,26	DATA 7	I/O
9,27	DATA 8	I/O
10,28	/AKNLDG	I
11,29	BUSY	I
31,30	/RESET	O
32,33	/FAULT	I
34,16	/DSTB OUT	O
35,17	/DAV	I
12	PE	I
13	SLCT	I
14	/USRO/AUTO FEED XT	O
15	/POWER ON / OSCXT	I
18	/SMART / 5 V	I
36	USR1	O

Table L-2. Serial Port Pin Assignments

Signal	I/O	Pin	Description
		7	Signal ground and common return.
TxD	O	2	Transmit Data. Serial data output line from transmitter. Value of one or "mark" is negative and value of zero or "space" is positive. Held in mark condition when transmitter is disabled.
RxD	I	3	Receive Data. Serial data input to receiver. "Mark" is negative and "space" is positive.
/RTS	O	4	Request to Send. When positive, tells the modem that the CPU is ready to transmit data.
/CTS	I	5	Clear to Send. When positive, says that the CPU may begin transmission.
/DSR	I	6	Data Set Ready. When positive, says that the modem has detected the carrier from the remote location. The CPU can now expect to receive data.
/DTR	O	20	Data Terminal Ready. When positive, says that the CPU is operational and ready to communicate with the modem or printer.
/DCD	I	8	Data Carrier Detect. When positive, says that the modem has detected the carrier from the remote location. The CPU can now expect to receive data.

APPENDIX M
GLOSSARY

Abort

To stop the execution of a program.

Acceptance block (■)

On a menu, the graphics symbol that indicates your current selection.

Acoustic coupler

A physical device used in communications between computers. Allows digital signals to be sent and received over telephone lines as analog signals. Acoustic couplers can only be used with switched lines (such as telephone lines), as opposed to modems, which can be used with either switched or leased (private) lines.

Alphanumeric

A set of characters containing both letters and numbers, as well as special characters, such as punctuation marks.

Analog

A type of electronic signal that describes and produces a range of results.

Application program

A program that performs a specific user function, such as Word Processing or Multiplan.

ASCII

A standard code used to represent letters and numbers in 8-bit bytes. Stands for American Standard Code for Information Interchange. The ASCII character set contains 256 characters.

Assembly language

A machine-level language consisting of symbolic statements that correspond more closely with the instruction and data formats of the computer than do high-level languages such as Pascal and COBOL.

Backup procedure

The process of copying data and/or text to another disk or diskette for storage.

Base Unit

The foundation common to all Wang Professional Computer systems, consisting of four components: the keyboard, the electronics unit, the System Diskettes, and the manuals.

BASIC

Beginner's All-Purpose Symbolic Instruction Code: A high-level programming language that can perform a wide range of user applications. Interpretive BASIC is an interactive form of BASIC.

Batch processing

A data processing method in which a program gathers a set of information and processes it collectively.

Baud

A unit used for measuring the speed of data transmission, usually over a communications line.

Bit

The smallest unit of data; a single binary digit having either a positive or negative value. In the Wang PC, eight bits equal one byte.

Block

A group of records operated on as a unit by the computer.

Board

A circuit board.

Buffer

A temporary storage area in main memory.

Bug

A mistake or malfunction within a program.

Burst

To separate continuous form paper into single sheets.

Byte

The amount of space, usually 8 bits, used to store one alphabetic or symbolic character.

Cable

A group of wires bound together and used to connect the system's components.

CANCEL

The key you press when you want to exit from a function or an application.

Card

A circuit board, such as the System card, used within the Wang PC. Memory, communications, Winchester controller, and video cards can be added to the Wang PC.

Cathode Ray Tube (CRT)

A video device resembling a television tube but having greater resolution. The CRT displays text as you enter it at the keyboard and as you recall it from storage.

Central Processing Unit (CPU)

The part of a computer that contains circuits that control the interpretation and execution of instructions. In addition, the CPU oversees the use of memory and monitors input/output operations.

Character

A letter, digit, or other symbol used in the representation of data.

Character printer

A machine that prints one solid character at a time, producing letter quality copy.

Character set

A group of characters used by the computer to represent letters, numbers, and punctuation.

Chassis

The part of the electronics unit that houses the disk drives.

Chip

A set of thousands of circuits mounted on a piece of semiconductive material, such as silicon.

COBOL

Common Business-Oriented Language; a high-level programming language designed for business and accounting functions.

Code

Rules for converting and representing data; also, to write a program.

Command

A system-level instruction used to direct an existing program.

Command Processor

System software that allows the user to give instructions to the computer by entering commands, as opposed to interacting with the computer through the use of menu screens.

Communication channel

A medium for carrying data between devices or locations.

Compiler

A device used to translate high-level languages, such as FORTRAN or COBOL, into machine-executable code.

Component

A device, such as a keyboard or a printer, that forms a part of a computer system.

Composite video

One of the two major types of video signals sent to monitors. A single composite video signal contains all of the information necessary to display an image on a screen.

Computer

A machine that can store, retrieve, and process data in accordance with a predetermined program.

Connector

The equipment used to make an electrical connection between two components.

Console

See Monitor.

CONTROL key

A key used in conjunction with other keys to alter their function.

CPS

Characters per second. Used to measure the speed of a printer.

Cursor

A brightly-lit, flashing bar that appears on the screen. Usually indicates the position of your next input.

Daisy wheel

The print element of a daisy wheel printer; a flat disk with characters around its circumference. A daisy wheel can be either 10- or 12-pitch or proportionally spaced in a variety of type styles.

Data

The information that computer instructions operate on.

Debug

To correct mistakes or problems within a program.

Default

A value supplied by the computer when several alternatives are possible but none has been explicitly provided by the user.

Density

The amount of data compressed on a disk. Disks come in single and double densities.

Diagnostic

Software that recognizes, locates, and explains either malfunctions in computer equipment or mistakes in a program.

Digital

Performing operations with data represented electronically as a series of binary numbers.

Directory

The part of a disk that contains the names of files on the disk and the number of the sector containing each file's first record.

Directory path

A name of a directory or a series of directories, separated by slashes and optionally preceded by a drive designation, that tells the computer how to access a file in a multilevel structure.

Disk

A flat circular plate with a magnetic surface on which data can be stored. A disk can be a fixed part of the disk drive or, as in the case of diskettes, can be physically removed from the system.

Disk drive

The unit that contains the disk. The disk drive contains a mechanism for controlling the movements of the read/write heads that store and retrieve information on a magnetic disk.

Diskette

A magnetic storage medium, usually smaller and more flexible than a hard disk.

Documentation

Manuals, guides, or other written material designed to help explain the use of computers.

DOS

Disk Operating System.

Drive designation

A parameter preceding the file name and consisting of a single letter that tells the computer what disk drive the file is on.

Editing

Making changes to previously written information in documents, files, programs, etc.

Electronics unit

The central component of the Wang PC system. Storage devices, main memory, and the CPU are located within the electronics unit, and all other components are connected to its back panel.

Erasable Programmable Read Only Memory (EPROM)

The EPROM, contained within the electronics unit of the Wang PC, is composed of two chips that contain various instructions that the computer reads each time it is turned on. These instructions include the power-on diagnostics and the start-up instructions.

Ergonomic

Designed with the concepts of human comfort and ease of use in mind.

ESCAPE

A character code, created by pressing an appropriate set of keystrokes, that performs a special function or action. For example, 2ND + COMMAND and then CANCEL restarts the system.

EXEC

The key you press when you want to run software from a menu, or perform or confirm a function within an application.

Expansion slots

Five multipin connectors located inside the electronics unit of the Wang PC and used for the installation of option cards.

Extension

A set of 1 to 3 characters separated from a file name by a period.

External device

Components connected to, but not part of, the electronics unit that can provide the system with outside communication or additional functionality (e.g., workstations or printers).

External storage

Various media (other than main memory) used for the storage of data. The Wang PC uses diskettes and the Winchester disk as its external storage devices.

Field

The area on the screen where you enter a response to a prompt.

File

A collection of related information treated as a unit (e.g., text file, BASIC program file, BASIC data file, or word processing document).

File Identifier (File ID)

The 1- to 8-character name of the file, optionally preceded by a directory path and optionally followed by an extension.

File name

The expression by which a file is referenced, consisting of up to eight characters and optionally followed by an extension.

File Specification (File Spec)

A file ID with the optional addition of a drive designation as the first parameter.

Firmware

Programs that exist in ROM when you buy a computer.

Floppy disk

See Diskette.

Format

The organization of data on a disk.

FORTTRAN

FORMula TRANslator: a high-level programming language used primarily in performing mathematical or scientific operations.

Graphics

The symbols, forms, colors, character sets, and commands used to organize screen and text images.

Hard copy

A paper copy, usually produced by a printer, of a screen image or computer file.

Hardware

Physical equipment associated with computers, such as electronics units, printers, monitors, and disk drives.

HELP key

A special key on the keyboard of the Wang Professional Computer that, in most applications, invokes a screen of information about the current procedure.

Immediate mode

A method of using the computer as if it were a calculator.

Index

An ordered list of the contents of a file or a document, together with keys or references for locating the individual entries.

Input

Any information supplied to the computer (e.g, entered through a keyboard or read from a disk).

Input/Output (I/O)

The transfer of information into and out of the system's memory.

Instruction

A command or statement that tells the computer how to perform an operation.

Interactive processing

Data processing in which the computer executes instructions as you enter them from the keyboard.

Interface

A piece of hardware or software used to connect two devices that cannot be directly connected.

Interpreter

Software that scans each line of program text, reads each statement in the line, and then performs the appropriate action or set of actions defined for that statement.

Interpretive BASIC

The interactive programming language supported by the BASIC interpreter.

Keyboard

The set of keys that allows you to enter data into the computer.

Keypad

A group of related keys arranged together on the keyboard.

K (Kilobyte)

A unit of memory equal to 1024 bytes.

Light Emitting Diodes (LEDs)

The set of five indicator lights located on the keyboard under the word processing/special function keys that indicate the status of the power-on diagnostics.

Line printer

A machine that prints text one line at a time, producing draft quality copy.

LIST

A BASIC command that instructs the computer to display a sequence of BASIC statements in a program.

Local Area Network (LAN)

A hardware system with the capability of interconnecting large numbers of computers by cable (e.g. WangNet).

Loop

A set of programming instructions that execute repeatedly.

Main memory

The memory residing in the electronics unit that stores all programs for use by the CPU.

Matrix

A rectangular array of numerical or algebraic quantities.

Matrix printer

A machine that prints characters made up of a series of dots, producing draft copy at very high speeds.

Memory

The Wang PC houses two types of memory: Random Access Memory (RAM) and Erasable Programmable Read Only Memory (EPROM). RAM is the memory available for user programming and applications. "Main memory" and "memory" both refer to RAM. EPROM is the section of memory containing items that cannot be deleted or changed by stored-program instructions because they are wired into the computer.

Menu

A list of options on the screen from which the user makes a selection.

Modem

A device that modulates and demodulates signals transmitted over communication facilities.

Glossary

Monitor

The video device, its casing, and associated circuitry.

Operating system

A collection of programs by which a computer manages itself and its communication with external devices.

Output

The data that the computer produces. Output can be sent to a monitor, printer, disk, or communication port.

Overflow

That portion of the results of an operation that exceeds the capacity of the intended unit of storage.

Parallel communications

The sending of multiple signals simultaneously.

Parameter

A variable to which you assign a value.

Parity bit

A means of internal self-checking to detect erroneous transmission of data. A parity bit, also known as a check bit, can determine if the number of 1 bits in a bit pattern is odd or even.

Pascal

A widely used, high-level, structured computer language known for its versatility.

Port

An access point through which data can enter or leave a data network; a connection point for a communication line on a CPU.

Printer

A device used to produce output on paper. See also Character printer, Matrix printer, and Line printer.

Program

A series of instructions or statements given in a coded form to a computer, designed to produce a specific result.

Prompt

A request for you to supply specific information that enables the computer to proceed to the next operation.

RAM

Random Access Memory. The memory available for user programs and applications.

Read

A process during which the computer accepts information from a disk.

Read-write head

A magnetic mechanism inside the disk drive that puts data onto (writes) or copies data off of (reads) a diskette or disk.

Record

A unit of data consisting of a number of bytes.

Resolution

The degree of fineness of graphic representation, expressed as the number of dots per linear inch or scan lines per screen.

RGB monitor

One of two major types of monitors. Color is displayed when the electron guns generate electron beams that excite the red, green, and blue phosphors covering the screen. Contrast with composite video.

Ribbon cable

A flat cable used to connect devices in a computer system.

RS-232-C

A serial port, most often used to attach a printer to your computer or to establish a communications link between your computer and another computer in a remote location. Also used to attach a modem to a computer.

SAVE

A BASIC command that allows a program in memory to be stored on disk.

Scroll

The movement of information vertically or horizontally on a screen.

Sector

A unit of a disk track consisting of 512 bytes.

Serial

Information that is transmitted one bit or byte after the other.

Software

Computer programs.

Special function (SF) keys

The group of 16 keys located at the top of the keyboard that can be programmed to perform specific tasks within various applications.

Statement

An instruction in programming language which is processed by the compiler and turned into object code (machine language).

String

A sequence of characters in a program command or statement.

System card

The circuit board in the electronics unit of the Wang PC that contains the CPU, RAM, EPROM, and several system connectors.

System Diagnostics diskette

The diskette containing software that can recognize, locate, and explain malfunctions in the equipment.

System Diskettes I and II

The diskettes containing the system software, consisting of a collection of programs written to coordinate the operation of all computer circuitry and allow the computer to run efficiently.

System screens

The series of screen displays that appear after you load System Diskette I into the drive.

Telecommunications

The transmission and reception of data over telephone lines.

Telecommunications enables a system in one location to send or receive data from a system many miles away.

Terminal

A device consisting of a screen and a keyboard, but no CPU or main memory. Usually used in a time-sharing environment.

Time-sharing

An arrangement that enables two or more users to use the same computer and receive output virtually simultaneously.

Track

One of a number of concentric rings on which data is stored on a disk.

Underflow

An error condition in which the result is less than the smallest number that the computer is capable of processing.

Utility programs

A subsystem of the operating system capable of performing support functions such as formatting disks, backing up files, deleting files from disks, and renaming files.

Variable

A quantity represented by a character that can have any of a given set of values.

Video card

A circuit board that allows various types of video devices to communicate with the System card.

Volume Identifier (Volume ID)

A parameter consisting of a 1- to 11- character alphanumeric. The volume ID serves as a security device that enables the user to verify that the correct disk has been mounted for the entered command.

Volume Label

See Volume Identifier.

Winchester drive

A disk drive that can be installed in the electronics unit of the Wang Professional Computer providing 10MB of storage.

Word processing

An application that permits you to write, edit, copy, and print textual information.

Workstation

The equipment contained in a work area; usually includes a monitor or a keyboard.

Write-protect slot

A notch located on the side of a diskette that provides a way of protecting information. When the slot is uncovered, information can be written onto the diskette. When the slot is covered, no information can be written onto the diskette.

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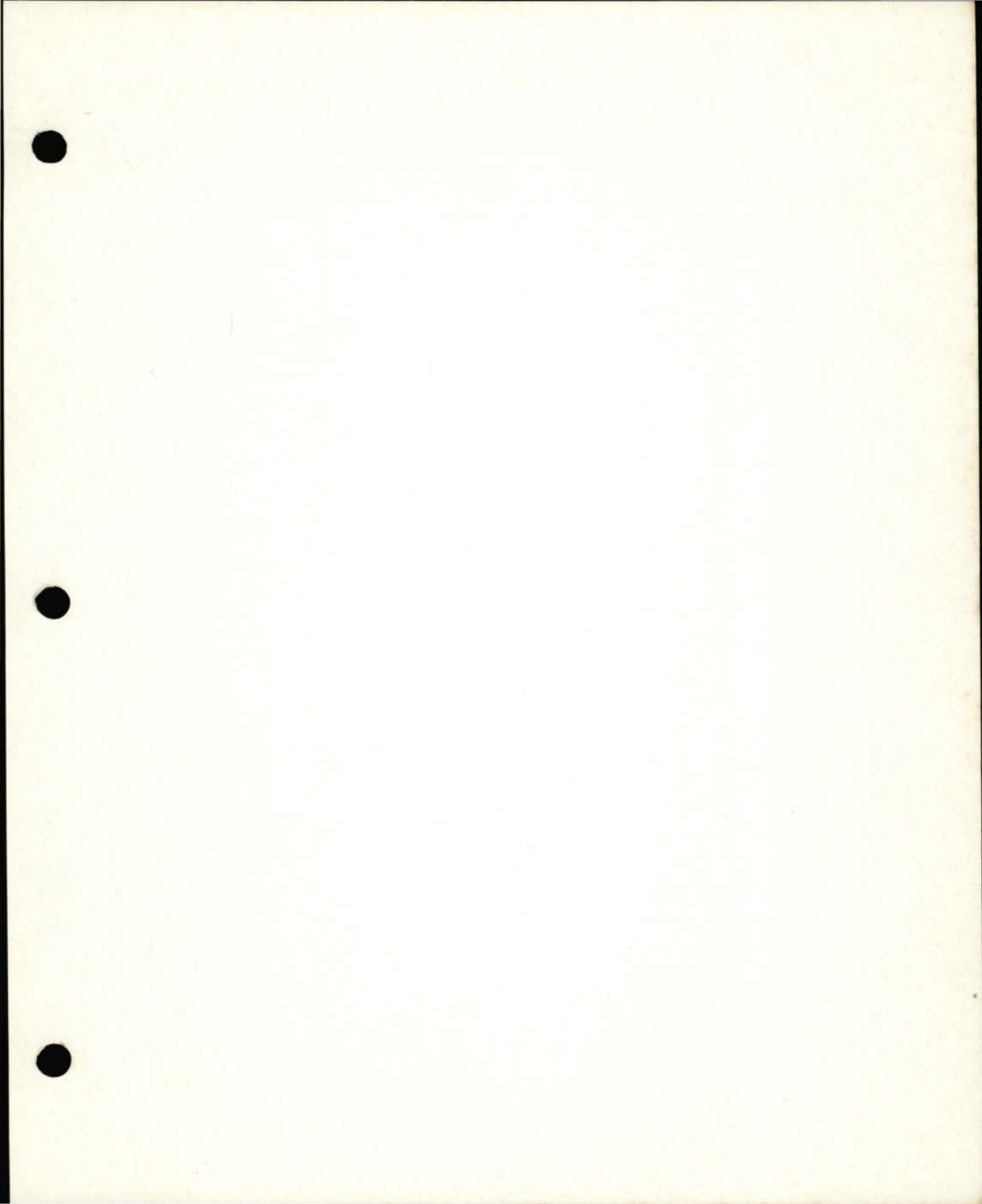
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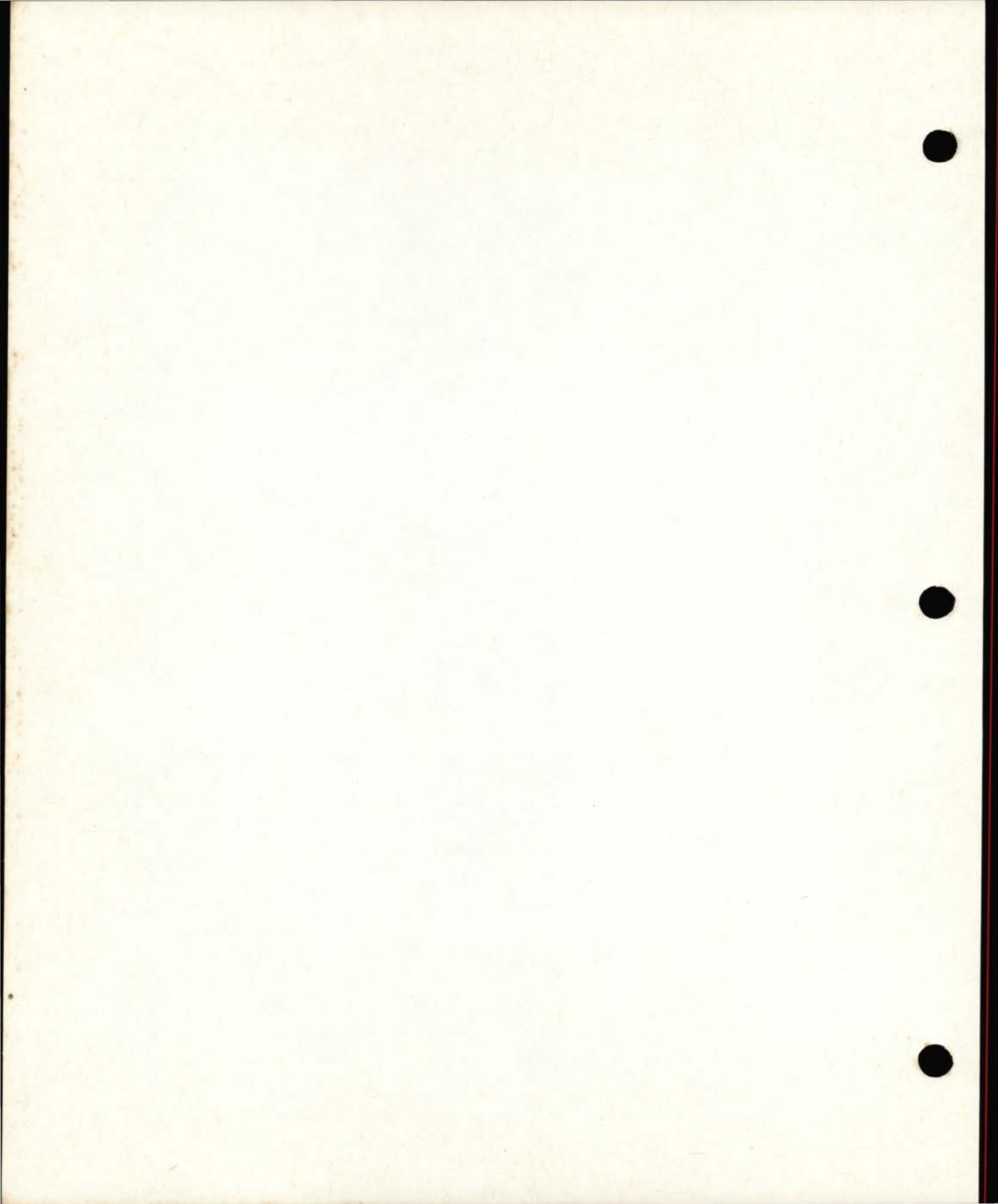
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