KAYPRO®

Professional Computer

SAMSON

READ ME FIRST

USER'S GUIDE

c October, 1985 **Kaypro Corporation** Part Number 4242-B

LIMITED WARRANTY

Kaypro Corporation warrants this new Kaypro computer to the original purchaser to be in good working order for a period of ninety days from the date of purchase from an authorized Kaypro dealer. Kaypro makes no other warranty with respect to the computer including, without limitation, no warranties as to its performance, merchantability, or fitness for any particular purpose.

Kaypro shall not be liable for any incidental or consequential damages related to the use of, or possible malfunction of the Kaypro computer. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty does not cover any computer which has been the subject of abuse, accident, any modification whatsoever, or repairs by unqualified service facilities.

Kaypro will, at its option, repair or replace the product during the 90-day warranty period without charge. In order to obtain warranty service, the customer must provide proof of purchase date and return the unit to an authorized Kaypro service facility. Alternatively, the customer may obtain an R.M.A. number from the Kaypro Hardware Technical Support Department at 533 Stevens Avenue, Solana Beach, California 92075, and ship the unit prepaid to Kaypro.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

8/29/84

- ✓ Boardmart
- ✓ other

FCC INFORMATION

As Kaypro keeps in step with computer technology, the models have changes which affect FCC ratings. The proper rating is affixed to the back of each computer, and the appropriate FCC information is given here.

FCC INFORMATION FOR CLASS A

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If this computer is used with peripheral devices, such as a printer or modem, then well-shielded cables must be used to preserve the radio interference characteristics.

FCC INFORMATION FOR CLASS B

This equipment generates and uses radio frequency energy and, if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type-tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna.
Relocate the computer with respect to the receiver.
Move the computer away from the receiver.
Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

WARNING: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

NOTE: TO PRESERVE THE EMI CHARACTERISTICS OF THIS COMPUTER, THE FOLLOWING EMI-SUPPRESSING CABLES (OR THEIR EQUIVALENTS) MUST BE USED TO CONNECT TO PERIPHERAL DEVICES:

CABLE APPLICATION	PART NUMBER	REMARK
KAYPRO Serial Port to Serial Peripheral (Printer, Plotter, Modem)	81-552	Option
To a Peripheral Modem	81-548	Option
KAYPRO Parallel Port to Printer	81-551	Option

CONTENTS

INTRODUCTION

This user's guide should serve as a pleasant introduction to the use of your new computer. This user's guide is for the KAYPRO PROFESSIONAL COMPUTER, model 4885.

The KAYPRO PC, as shipped, is configured to use a monochrome monitor. A monochrome monitor is a video screen that displays text in one color, usually green. If you wish to use this computer with any other type of monitor, have your Kaypro dealer configure the computer for that monitor.

This manual should be considered an introduction to the capabilities of your KAYPRO PC. More features are described in the other manuals about MS-DOS, the disk operating system by MicroSoft. The MS-DOS manuals are written by MicroSoft Corporation to be used with many computers, so some information may not apply to the KAYPRO PC.

There is TECHNICAL INFORMATION for advanced users and technicians.

There is a GLOSSARY at the back if you have questions about unfamiliar words.

After you use the manual the first time, it can serve as a reference by referring to the INDEX at the back.

The last page is a RETURN FORM for you to tell us how we can make this user's guide better serve the new user.

There are manuals which tell how to use the various software programs, such as the word processor and the telecommunications program.

7/30/91
- DS DOS 5
w/ncom - installed
- 30ms (40 if can find)
- controller card
/ #258-270 + tax

FEATURES OF THE KAYPRO PC

The KAYPRO Professional Computer is an MS-DOS based microcomputer system which is functionally compatible with the IBM PC. Most software that runs on the KAYPRO 16 Series Computers or the IBM PC or IBM PC XT will run on the KAYPRO PC. The KAYPRO PC will not read diskettes created on a KAYPRO 2, 4, 10 or 2000.

The KAYPRO Professional Computer features an IBM PC compatible keyboard with enhanced keyboard layout similar to that found on the IBM PC/AT. The Standard features of model 4885 are:

- MS-DOS operating system
- ✓ 8088 processor - 286
- 256K standard memory
- ✓ Upgradable to 640k RAM - 30MB
- Two integral 360K double-sided double-density diskette drives
- High resolution Monochrome Monitor
- High resolution (640 by 200) bit-mapped graphics with a composite, RGB or black and white monitor.
- High Resolution (640 by 350) bit Monochrome Video with a monochrome monitor.
- Composite, RGB and Monochrome video output connectors
- One asynchronous serial port
- One parallel printer port
- IBM PC-compatible keyboard
- A Complete Applications Software Package
- GW-BASIC language (BASICA-compatible)
- Six user expansion slots

- Amer. Cmptr Svcs - 9922 College
- 20-40 mb - ?
- Time -
- Controller card (40) + HD. (389) + install lbr (55) ? = $500
- can use same CPU latch, ? monitor
- BSM - install floppy
- CDU / keybd / DOS BSM - (to shop)

Broadcast - Dave
- 15 - install
- 399 - drive
- 10% disc.
$899 - new CPU module
- DS DOS 5.0 installed
Tecs
30 MB - 258 + install
or 40 ms - ...
- Speed x 2
- Just HD: ...
- If want > speed: 286 upgrade + hd. = $400
+ upgrade this latch

WHAT YOU WILL NEED

Before you start, you should have:

- Blank diskettes. You should buy 5.25 inch, double-density, double-sided, soft-sector diskettes such as KAYPRO DSDD Diskettes, (Order No. 1548) available from your dealer.
- A work surface at typing height
- A power outlet close to the work surface. The outlet should be grounded and should be on a circuit that isn't loaded with other appliances.
- A good rule of thumb for temperature is--if you are comfortable, your computer will be comfortable.

OPTIONAL EQUIPMENT

POWER LINE FILTER

If there is heavy machinery operating from the same power source, or if there are frequent power surges, you may want to invest in a power line filter. A filter removes spikes and variations in the power line that can upset the operation of your computer.

BACKUP POWER SOURCE

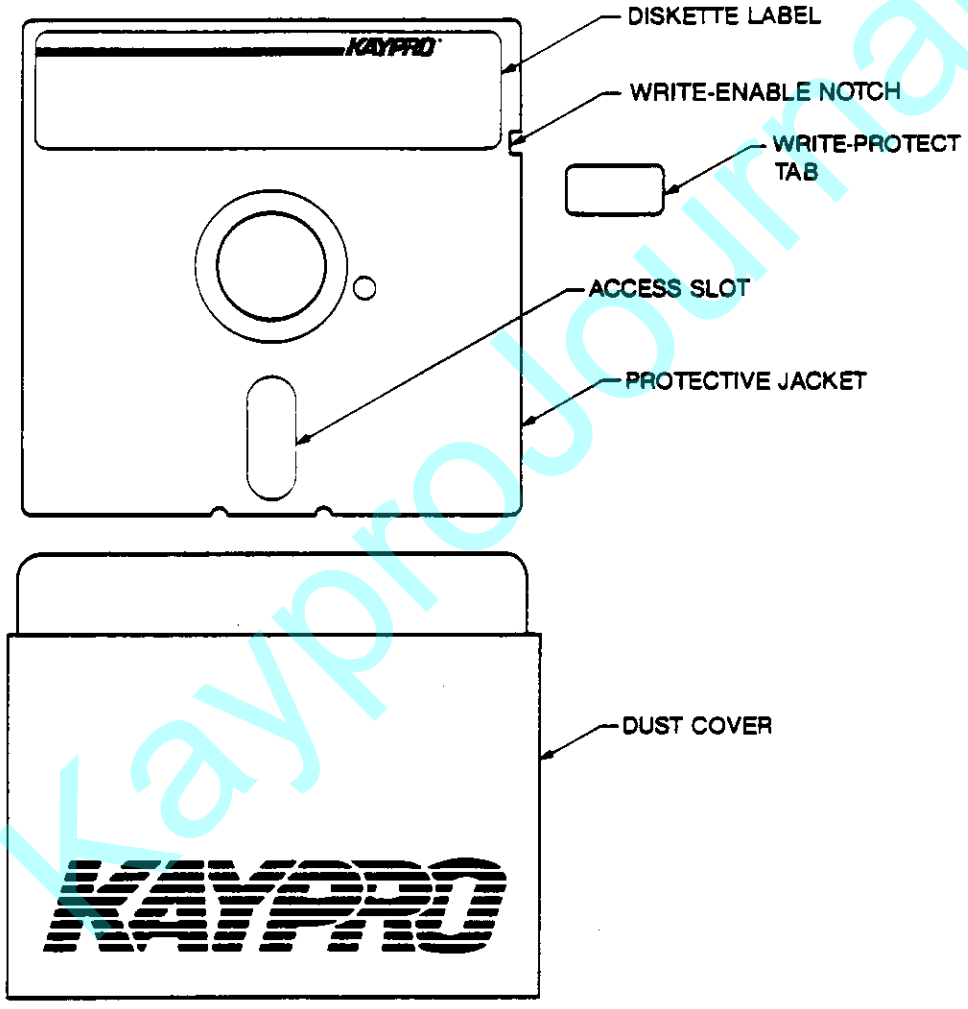
To provide continuing power in case of a power loss, backup power sources are available from various manufacturers. Contact your dealer about this.

OVERSEAS POWER REQUIREMENTS

If you want to take your computer out of the United States, your dealer must adjust the power supply so that it can use the power supplied in other countries (Usually a voltage of 230 VAC). This adjustment *must* be made by an authorized Kaypro Service Representative.

TAKING CARE OF DISKETTES

The computer uses diskettes as a permanent form of mass storage. The information is stored magnetically on the surface of the disk, which is permanently sealed inside a protective jacket.



Chemicals from a fingerprint on the exposed surface of a diskette can destroy the product of an entire day's work. Here are a few simple guidelines for handling and using diskettes:

HANDLING DISKETTES

Always handle diskettes by the label or the protective jacket. Do not touch the exposed surface (the access slot) of a diskette. Do not bend diskettes.

STORING DISKETTES

Keep diskettes in their dust covers when they are not in use. Store diskettes in a container or file in a clean, dry, cool place.

Do not store diskettes near any magnetic fields, such as those in dictating equipment, electronic calculators, telephones, and other electronic devices.

Do not store diskettes near any chemicals or expose them to excessive tobacco smoke or fumes from cleaning solvents.

STORING INFORMATION

Store information as you create it--about two to four times an hour--and store your work whenever you leave the computer, even briefly. The procedure for storing information depends on the program being used.

Make backup copies of your diskettes to ensure that, if one is lost or damaged, you will still have a copy.

PROTECTING DATA

To ensure that you do not accidently erase stored information, cover the write-protect notch with the tabs that are provided with new diskettes.

If this notch is covered, information can only be read from the diskette. If you want to write information to a diskette, don't cover its write-protect notch.

LABELING DISKETTES

Label all diskettes that contain information. Use press-apply labels; write the label first, and then apply it to your diskette. If you must write on a label which is already on a diskette, use only a soft, felt-tip pen, as a pencil or ballpoint pen can damage the diskette.

REMOVING DISKETTES FROM THE DRIVE

Do not remove a diskette from the drive when the drive lamp is on.

Always remove a diskette from the drive before turning the computer off.

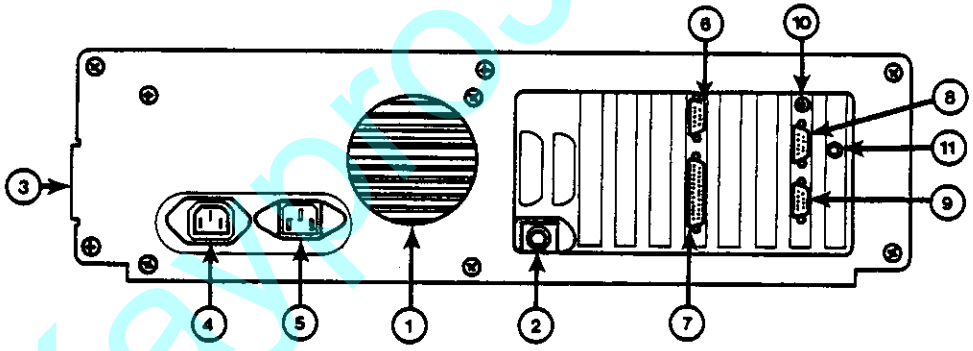
Never turn the computer off when the drive lamp is on.

SETTING UP YOUR KAYPRO PC

1. Set the KAYPRO PC on a work surface. The ideal work surface for setting up the KAYPRO PC is a table that allows access to the front and rear of the unit. Save the packing materials in case you ever want to ship your KAYPRO. The box should also contain the following:

   Software Manuals and Master Diskettes
   KAYPRO ownership documents
   Power Cord
   Keyboard
   Security Keys pouch

2. Set the KAYPRO on the work surface with the rubber feet facing down. Look at the rear panel, which is black, and has a circular vent for the fan. Refer to the illustration below and note the positions of the monochrome(8) video port, the keyboard connector(2), the monitor power connector(4) and the computer power connector(5).



1. Fan
2. Keyboard Connector
3. Power Switch (On the side)
4. Monitor Power Connector
5. Power Cord Connector
6. Serial Port (RS-232C)
7. Parallel Port (Centronics)
8. Monochrome Video Port
9. RGB Video Port
10. Composite Video Port
11. Reset Button

3. Read the instruction for the monochrome monitor and follow them.

4. Remove the monochrome monitor from the its box and set it carefully on the computer, with the monitor's rear panel, power cord and signal cable facing you. At the end of the signal cable is a nine pin connector, called a DB-9.

5. Refer again to the illustration on the previous page, and note the positions of the video ports . The monochrome port has the same connector (a DB-9) as the signal cable from the monitor.

6. Connect the monochrome monitor to the monochrome video port. Make a firm connection by lining up the connector from the monitor with the monochrome video port(8) on the computer, then slide the connector into the port.

7. Using a small slotted screwdriver, tighten the screws on both sides of the connector. Do this by alternating tightening the screws. Tighten one a few turns, then the other, then back to the first and so on until the connection is firm.

8. Make sure the monitor is turned off.

9. Plug the power cord from the monochrome monitor into a grounded wall socket.

10. Connect the end of the keyboard cord to its connector(2) on the computer.

11. Connect one end of the power cord to its connector(5) on the computer. *Do not connect the power cord to the wall socket yet.*

12. Place the keyboard in front of the front panel. The front panel is the panel with the circular lock and the drives on it.

13. Sit in front of the computer. Place the keyboard in front of you. The keyboard can be angled toward you using the angle struts located on the bottom panel of the keyboard.

14. Open the doors of the diskette drives, and remove the cardboard shipping protectors. If you ever ship your KAYPRO, be sure to place the protectors in the diskette drives.

15. Make sure the power switch on the right side of the computer is in the OFF position.

16. Connect the power cord to the wall socket.

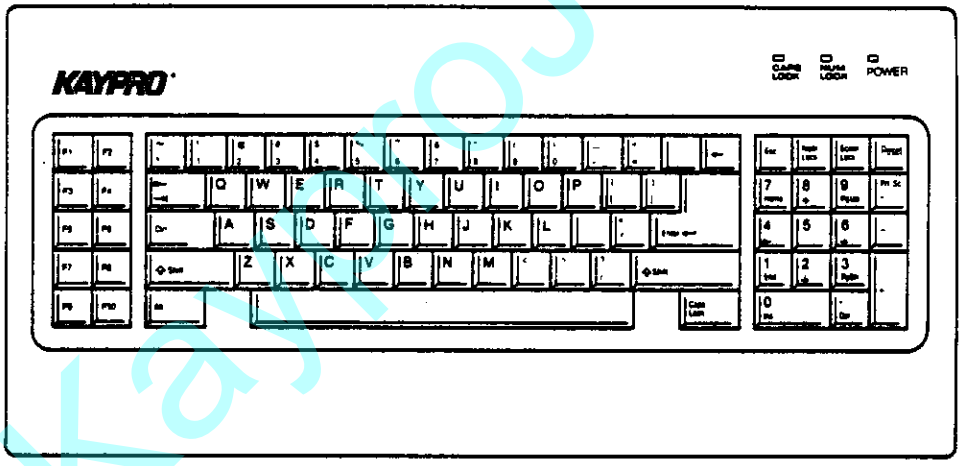
15. Read the the following information about the keyboard before turning on the computer.

THE KEYBOARD

The keyboard is divided into three areas: the function keys on the left, the typewriter-style keyboard in the center, and the calculator-style keypad on the right. The calculator-style keypad has two modes of operation--numeric and function. Both modes are described herein.

The keyboard also has three lights: two that show the status of the Caps Lock and Num Lock keys, and the third which will light if the keyboard receives power.

To adjust the keyboard from a flat position to a tilted position, lower the stands located underneath the keyboard.



FUNCTION KEY AREA

The keys labeled F1 through F10 are multi-purpose function keys. The function of each of these keys depends on the program in use.

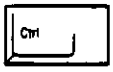
Unless a program has redefined these keys, they perform editing functions.

TYPEWRITER AREA

The keys in the center area of the keyboard are similar to those of a typewriter. Most of the keys will repeat as long as you hold them down.

The following keys perform special functions:

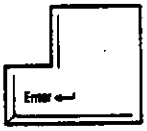
Moves (tabs) the cursor horizontally multiple spaces. The program in use determines the direction and the number of spaces the cursor moves.



Used simultaneously with one or more of the other keys. For example: to stop a command, simultaneously press the Ctrl and Break keys.

Used simultaneously with other keys to define an alternate function to the other key(s).

Moves the cursor from right to left (backspaces). Some programs erase the characters as the cursor moves.



Tells the computer to execute a command. It also works like a carriage return by moving the cursor to the start of a new line.

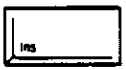
Converts alphabetic characters from lower case to upper case and from upper case to lower case. Each time you press this key, you will go from one mode to the other.

When in the upper case mode, the Caps Lock status lamp is ON.

THE KEYPAD

The keypad area has numeric keys and other special keys that perform various functions. When the Num Lock key is pressed, the Num Lock light lights, and the numeric keys function in *numeric* mode, meaning that the keys that have numbers on them will output numbers when they are pressed. If the Num Lock Key is not pressed, the numeric keys operate in *function* mode, meaning that the keys that have numbers on them will perform functions, such as scrolling through text. The program in use usually determines the function of each key.

THE NUMERIC KEYS IN FUNCTION MODE



Allows you to insert characters in a line of text.

Deletes the character at the cursor position.

Moves the cursor to the top left of the screen.

Moves the cursor to the last character on a line or to the bottom right of the screen.

Displays the previous page of text.

Displays the next page of text.

The four arrow keys move the cursor in the direction indicated by the arrow on each key.

THE KEYPAD--FUNCTION KEYS

These keys surround the numeric keys, along the top and right side of the keypad. They perform specific functions, regardless of the mode of the numeric keys. Some programs may change the function of one or more of these keys.

This key is often used to cancel some action or to escape from an undesired activity.

This key is often used simultaneously with the Ctrl key to stop the computer.

When this function is active, the Scroll Lock lamp is ON

To print one screen of text, simultaneously press the Shift and PrtSc keys.

To send the text to the printer at the same time as it is being displayed on the screen, simultaneously press the Ctrl and PrtSc keys; to cancel this function, press both keys again.

This key has no function at the present time.

Switches the keypad keys from numeric mode to function mode and from function mode to numeric mode.

Each time you press this key, the computer switches from one mode to the other. In the numeric mode the Num Lock lamp is ON.

STARTING THE KAYPRO PC

To start the KAYPRO PC you must first unlock the keyboard. The computer has a lock that disables the keyboard to prevent unauthorized use of the computer. Use the keys provided to lock and unlock the keyboard. The keyboard may be locked or unlocked while running a program.

1. Unlock the computer by inserting the circular key into the lock and turning it to the left.

2. Turn the monitor on, and adjust its brightness to the maximum level.

3. Turn on the computer, using the power switch on the right side of the machine.

On the front panel of your KAYPRO PC are three indicator lights:

- a power light, denoted by the figure of a light bulb, to indicate the power is ON.

- a fixed disk light, denoted by the figure of a cylinder, which lights if a fixed disk is present.

- two diskette drive indicator lights, one on each drive, that light when that drive is in operation.

4. Adjust the screen brightness using the brightness control knob on the monitor.

   The KAYPRO PC will do a memory check--you will see numbers scrolling in the upper left corner of the screen--then the computer will look for a diskette in the upper diskette drive (the A drive). When it does not find one, you will see the message *Boot disk failure. Type key to retry*_.

5. Before inserting *any* diskettes read and follow the following instructions on copying master diskettes.

COPYING MASTER DISKETTES

Master diskettes are valuable, and should never be used for any purpose other than to make working copies. A working copy is the diskette that you will use in day-to-day operations. When a working copy becomes old or unusable, then make a new working copy using the Master diskettes.

At this point, the the message *Boot disk failure. Type key to retry*_ should be displayed. To make a working copy:

1. Insert a Kaypro AutoStart Master diskette into diskette drive A (the upper drive). Insert the diskette with the label up, and the pill shaped aperture forward.

2. Reset the system by pressing the Ctrl, Alt, and Del keys simultaneously.

   The computer will read the diskette and the screen will display information and instructions.

3. Read the screen carefully, then follow the instructions.

4. When the working copy is completed, remove the diskettes from drives A and B.

5. Store the master diskette in a safe place for future use.

6. Reset the system by pressing the Ctrl, Alt, and Del keys simultaneously.

7. Repeat this procedure with all of the master diskettes.

8. For now, turn off the computer by using the power switch on the right side of the computer.

MS-DOS, THE DISK OPERATING SYSTEM

MS-DOS is an acronym for MicroSoft Disk Operating System. MS-DOS is the system that the KAYPRO PC uses to manipulate information. Anytime you wish the computer to do something, you must issue a command from the keyboard to the computer using MS-DOS. Some of the main functions of MS-DOS are to handle input from the keyboard and output to the screen and communicate with peripheral devices, such as a printer.

Programs such as word processors, spreadsheets and database systems, though they may have a syntax of their own, work *through* MS-DOS, and it is important to begin with a working knowledge of your computer's operating system. The following pages will get you started using MS-DOS with the KAYPRO PC. You will find more extensive and complete explanations of the MS-DOS commands in your MS-DOS USER'S GUIDE. For now, begin by making sure both diskette drives are empty, then:

1. Turn on the KAYPRO PC, using the power switch on the right side of the machine.

2. Insert the working copy of your MS-DOS diskette into the A drive and close the drive.

3. The date prompt will appear.

SETTING THE DATE

When the computer starts (or "boots") from a diskette you are usually prompted for the date and time. The prompt for the date looks like this:

```
Current date is Tue 1-01-1980
Enter new date: _
```

If you do not wish to change the displayed date, press the ENTER key. To set the date, enter numerals only. Separate the numerals with hyphens or slashes. You do not have to enter the "19" in the year. For example, at the "Enter new date: _" prompt you could:

```
Type: 9-26-85
Press the ENTER key.
```

Or:

Type: 9/26/85
Press the ENTER key.

The numbers in the date are *delimited* by either hyphens or slashs. The number of days in the months and leap years are changed automatically.

SETTING THE TIME

After you have entered the date, the prompt for the time will appear:

Current time is 0:00:19.93
Enter new time: _

To set the time enter numerals only. Use military time (If p.m., add 12 hours to the present time; for example, if it is 5:20 in the afternoon, it is 17:20 military time). Separate the hour and minutes with a colon. You need not enter the seconds <ss> or hundredths of seconds <cc>. For example, at the "Enter new time: _" prompt you could:

Type : 13:00
Press the Enter key.

This would set the time to 1:00 pm. Once the time and date are entered, any files you create or alter will have the date and time recorded in them. In the upper left corner of your screen you should now see the characters "13:00 A>". This is the time followed by the *system prompt.*

SYSTEM PROMPTS

The A> and B> prompts are called *system prompts.* When you see a prompt, A>, or B>, it is an indication that the computer will accept typed commands to tell it what to do. The letter designation in the prompt tells you the current logged drive, which is the drive you are currently using. The flashing line is a *cursor*--a place marker to show where information can be entered. The next character you type will appear at this location.

SAVING INFORMATION

While working with an applications program, such as a word processor or a spread sheet, you should save information often--every ten minutes or so. Information is saved by issuing the command that places the information on a diskette. Each program has a different command for saving information so refer to the manual for the program you are using.

RESETTING THE COMPUTER

Strange things may happen when you do something that the program or computer doesn't expect, or that are due to a "bug" (a hole in the logic of a program). Try resetting the computer by pressing Ctrl, Alt, and Del simultaneously. If this does not work, then the computer must be reset using the reset button on the rear panel. Either of these procedures will destroy information which is in the temporary memory of the computer, but will not affect the information which has been saved on the diskette.

UNDERSTANDING FILES

A file is a collection of related information, either data, text or instructions, stored on a magnetic surface (diskette or fixed disk drive) and given a specific name. All information in your computer is stored in the form of files. If you use WordStar to write a letter to a friend, the file's name might be FRIEND.LTR. A data file might be named PARTS.DTA. WordStar itself is a file, called WS.COM. A file name can have a maximum of eight letters in it, with a three letter extension. For example: AUTOEXEC.BAT or DISKCOPY.COM.

RESERVED CHARACTERS AND NAMES

When using your computer, you will be creating and naming files. These are the characters that you must not use in a file name:

Period	(.)	Comma	(,)
Colon	(:)	Semicolon	(;)
Plus Sign	(+)	Equal Sign	(=)
Less than sign	(<)	Greater than sign	(>)
Slash	(/)	Backslash	(\)
Left Bracket	([)	Right Bracket	(])
Bar	(|)	Quotes	(")

It is recommended that you use only the letters A through Z and the numbers 0 through 9, as some programs may have problems with other characters.

MS-DOS has names for the components of your computer. MS-DOS calls these components *devices*, and their names are reserved. Do not use any of the following device names in a filename:

DEVICE	NAME
Console (keyboard/screen)	CON
First serial port	AUX or COM1
Second serial port	COM2
First printer port	LPT1 or PRN
Second and Third printer port	LPT2,LPT3
Test device	NUL

MS-DOS will accept lower case letters for commands and file names and will automatically convert them to upper case.

Files have different attributes; characteristics that allow them to be used in specific ways. Some files are *hidden*, so they cannot be viewed, erased or copied, while others are protected by being *read only files*. This is a list of the attributes a file may possess.

SYSTEM FILES

A system file is one that composes the operating system, such as MSDOS.SYS. System files are hidden files (see below).

READ ONLY

A read only file is a file that cannot be erased or changed in any way.

HIDDEN FILES

A hidden file is a file that exists, but cannot be observed or affected by most commands. Were you to list the files on a diskette, you would see every file in the directory, except the hidden files. A hidden file cannot be copied or erased. Certain commands and programs do affect hidden files: KCOPY and CHMOD for example. Both of these are described later in this manual.

ARCHIVE FILES

An archive file is one that has not been copied (by a backup program) since it was last changed. Archive files are usually data files that are changed every day, however, any file can be an archive file.

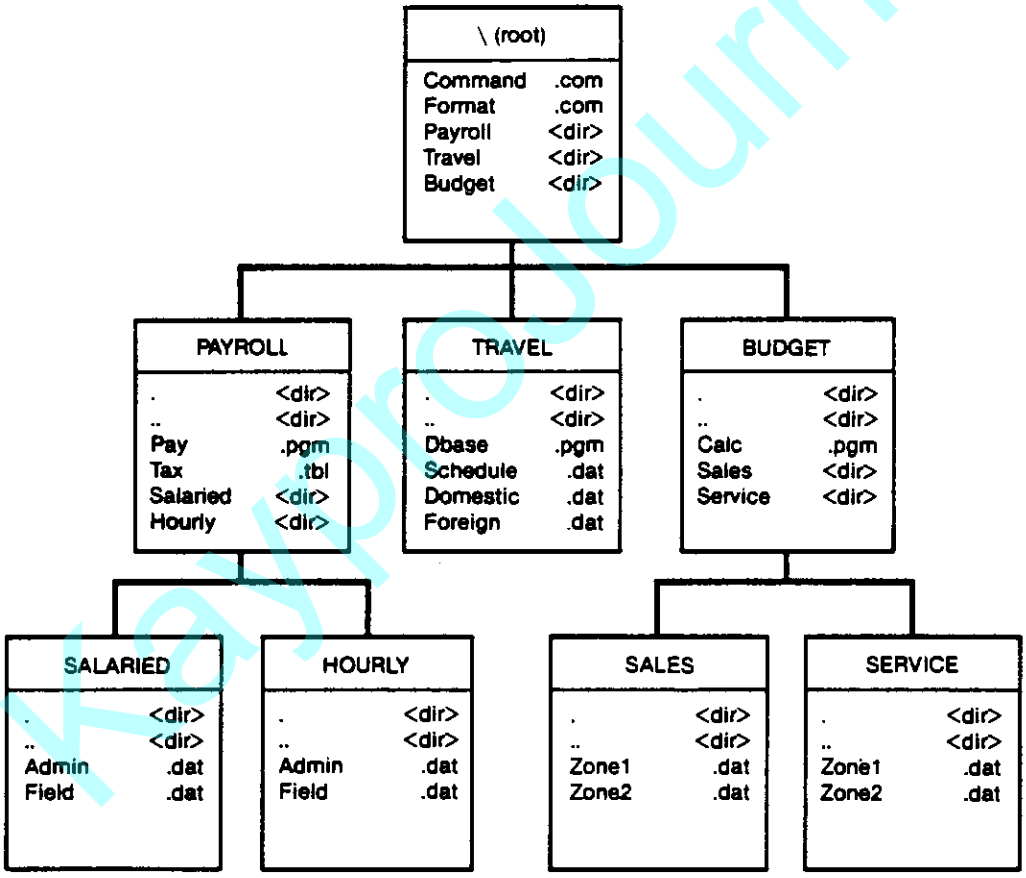
The program KCOPY is a file copy program that can be used to display a list of files and their attributes. See USING KCOPY, later in this User's Guide.

In computer books, the generic name for a file is <filename>. When you see this, substitute the name of the file you want to use, but do not type the angle brackets < >. Include the file extension, if there is one.

DIRECTORIES

A directory is the place on a diskette or fixed disk where a file is stored. Directory names have up to eight characters with the same restrictions as filenames, but with no extensions. Directories have value relative to each other; some directories are subordinate to other directories. The first directory is called the root directory. There is one (and only one) root directory on every diskette or fixed disk. The root directory is created automatically when you format a diskette or a fixed disk. Branching from the root directory, there can be other directories which contain logical groupings of files, or other directories, which in turn contain files.

Example:



In the directory ROOT, you might have your MS-DOS utility files: CHKDSK.COM, DISKCOPY.COM, etc. In PAYROLL, your accounting programs. In PAYROLL's subdirectory SALARIED, you would have data on salaried employees, while in HOURLY you would have data on those that receive an hourly wage. In the directory TRAVEL you might have travel expenses incurred by employees. You might work on travel expenses in the TRAVEL directory, then copy data to the PAYROLL directory. The directories keep travel expenses and payroll distinct and separate entities. However, both program's presence on the same diskette allows for quick use by either program of any file.

The structure of the above directory organization is called a *directory tree*. The root directory is the *parent directory* for the entire tree. Subdirectories can be parent directories also, by having subdirectories themselves. In the above directory tree the directory BUDGET is a subdirectory of the directory ROOT. However it is also the parent directory of the directory SALES.

The working copies of your KAYPRO PC software contain no subdirectories. The KAYPRO PC, automatically uses the root directory until you issue a command to create a new directory, then issue a command to change to it.

LISTING A DIRECTORY

When a directory is listed, the listing consists of each file name, its size in bytes, and the time and date of its last change.

To list all files in the current directory, at the system prompt:

Type: DIR
Press the ENTER key.

If you wished to list the files in a different directory, specify the path to that directory (see PATHS in the index).

To list all files on a diskette in a different drive, after the system prompt, type the DIR command, a space, the drive letter and a colon. For example, place the working copy of your WordStar diskette in the B drive and:

Type: DIR B:
Press the ENTER key.

To list all files with a specific file name which are on the disk in the A drive, after the system prompt, type DIR and the file name. For example, with the working copy of the MS-DOS diskette in drive A:

Type: DIR FORMAT
Press the ENTER key.

To list all files with a specific file name that are on a diskette in a different drive, designate the drive and the filename. For example, with the MS-DOS diskette in the A drive and the WordStar diskette in the B drive, at the A> prompt:

Type: DIR B:WS
Press the ENTER key.

To list all the files with a specific extension, designate the extension. For example, at the A> prompt:

Type: DIR .COM
Press the ENTER key.

To pause the directory listing after the screen is filled, type a /P after the command, for example: DIR B:/P

To display only file names (five per line) in a Wide Display, type a /W after the command, for example: DIR B:/W

A directory listing the files on a diskette may look like this:

Directory of B:\

```
MAILMRGE OVR     13568     8-09-84    10:15a
WINSTALL EXE     40960     8-09-84    10:15a
WS       COM      4096    11-21-84     9:30a
WS       INS     45824    11-21-84    10:15a
WSMSGS   OVR     29056    11-23-84     6:35p
WSOVLY1  OVR     41216    12-01-84    12:49p
       6 FILE(S)        2892387 bytes free
```

Directories can be created, modified, copied, and erased, just like files.

CREATING A SUBDIRECTORY

To CREATE a subdirectory directory of the current directory:

Type: MD <NEWNAME>

Substitute the name of the directory you wish for <NEWNAME>.

CHANGING TO A SUBDIRECTORY

To change from the current directory to a directory that is lower on the directory tree:

Type: CD <OTHERDIR>

Substitute the destination directory name for <OTHERDIR>. When changing to a directory that is not beneath the current directory, you must specify the *path*. See the section of this manual titled PATHS.

CHANGING TO A DIFFERENT DIRECTORY

To change to another directory, type CD and the filenames in the desired path, for example:

CD \ABLE\BAKER\CHARLIE

GOING TO THE PARENT DIRECTORY

To go to the parent directory of the current directory:

Type: CD ..
Press the ENTER key.

RETURNING TO THE ROOT DIRECTORY

To return to the root directory from anywhere in the directory tree:

Type: CD\
Press the ENTER key.

REMOVING A SUBDIRECTORY

First, use the DEL command to delete all files in the directory you want to delete. Then, from the parent directory:

Type: RD <UNWANTED>
Press the ENTER key.

Substitute the name of the directory to be removed for <UNWANTED>. For further information, see the MS-DOS USER'S GUIDE.

PATHS

A path is a route through the directory tree. When using certain commands, you must specify the path to the files with which you are working. There are two types of paths: absolute paths and relative paths.

ABSOLUTE PATHS

When specifying an absolute path, you must *begin at the root directory*, no matter what directory you are currently in. For example, if you are logged on to the A drive, in a subdirectory called DATA, and you wish to list the files in a subdirectory called TEXT, from the A> prompt:

```
Type:  DIR \WRITE\TEXT--- The directory to list
           |    |
           |    +---------- A directory along the path
           |
           +--------------- The Root Directory
```

RELATIVE PATHS

Relative paths start at the current directory (the directory that you are in) and involve only subdirectories of the current directory. For example, if you are in the directory ROOT, and you want to see a listing of the files in the sub-directory PROG, from the A> prompt,

```
Type:  DIR WRITE\PROG--- The directory to list
               |
               +---------- A directory along the path
```

If you wish to perform an operation (DIR,COPY,K-COPY) on a file or directory that is above your current position in the directory tree, then use an absolute path. Otherwise use a relative path.

Before proceeding further, look up the DIR, COPY, CHANGE DIRECTORY and PATH commands, and the definition of wild cards in your MS-DOS USER'S GUIDE. Pay special attention to the COPY command. Once you have some blank formatted diskettes (see FORMATTING A DISKETTE). Do some experimenting. Create directories, list them. Change from directory to directory, copy a file, use PATH to link two directories. Use the wild cards in copying and displaying files.

WORKING WITH DISKETTES

FORMATTING A DISKETTE

All new diskettes must be formatted to prepare them to receive information. When a diskette is formatted for the KAYPRO PC, it is magnetically imprinted with 80 circular tracks, with each track having 9 sectors.

CAUTION: Formatting a diskette erases all the information which is on it.

To format a diskette:

1. Place your working copy of the MS-DOS diskette in drive A.
2. Put a new diskette in drive B, and close the drive door.
3. After the A> prompt, type: FORMAT B:
4. Follow the prompts. Respond with upper-case letters.

The FORMAT program has several options. These are described in detail in your MS-DOS USERS GUIDE.

PLACING THE SYSTEM FILES ON A DISKETTE

System files are put on a diskette so the KAYPRO PC can be started from that diskette. If you want to place the system files on a diskette, the destination diskette must either have no files on it or already have a version of the system files that you want to update.

To place the system files on a diskette, after the system prompt, enter the command, SYS, and follow it with the drive letter and a colon (:):

Type: SYS B:
Press the ENTER key.

Read and follow the prompts on the screen.

There are two MS-DOS system files, IO.SYS and MSDOS.SYS, that never appear on directory listings.

COPYING A DISKETTE

To copy the contents of the diskette in drive A to the diskette in drive B, insert a blank, formatted diskette in drive B, then:

Type: COPY a: *.* b:/V
Press ENTER

Follow the prompts. The name of each file will be displayed on the screen as it is copied onto the diskette in drive B. The /V option means "verify"--an error message will be displayed if there is an error in copying.

You can make a duplicate of a diskette by using the DISKCOPY command. For example, to duplicate the contents of the diskette in drive A on the diskette in drive B, insert a blank formatted diskette in drive B and:

Type: DISKCOPY a: b:
Press ENTER

Follow the prompts. When a diskette has had changes made to it the information on it is no longer in sequence, therefore the time taken to read the diskette is increased. When copying such a diskette, format a diskette, then use the COPY command instead of DISKCOPY. The newly-copied diskette will have the information placed on it sequentially.

COPYING FILES

Copying files from one place to another is done with the COPY command. The correct form of the COPY command is:

COPY B:THISFILE.TXT A:THATFILE.DOC

The above example will copy the file THISFILE.TXT from drive B to drive A, naming the copy THATFILE.DOC in the process.

You can copy groups of files by substituting wildcard characters in the file specification. Wildcard characters are the asterisk and the question mark. A question mark will match with any one character; the asterisk can

substitute for more than one character. Examples of wildcard file specifications are:

TH??FILE.TXT	will match with THATFILE.TXT, THISFILE.TXT, and THEMFILE.TXT.
THISFILE.*	selects THISFILE.TXT, THISFILE.DOC, THISFILE.ASM and THISFILE.COM.
TH*.*	allows a match with any file where the first two letters of the filename are TH. You would get THEM.COM, THOSE.ASM, THE.001, THATFILE.ASM, etc.
.	matches with all files in the current directory.

For more information about copying files, see the COPY section in the MS-DOS USER'S GUIDE.

To copy a file from another drive to the default drive (In this case lets say the A drive) and give it the same name, you would:

Type: COPY B:<filename>
Press ENTER

This will copy the file <filename> to the default drive, the A drive. If the file specified is on the default drive, the COPY will be aborted.

To copy a file to a designated drive and give it the same name:

Type: COPY <filespec> B:
Press the ENTER key.

To create a copy of a file and give it a different name:

Type: COPY filename.ext newname.ext
Press the ENTER key.

CONCATENATING (JOINING) FILES

To concatenate files is to link them, or join them. Use this procedure to join text or data files. Do not concatenate files with COM or EXE extensions. Use the plus sign between the filenames or file specifications.

For example:

```
COPY SALES.CHT + MEMO.TXT + C:LETTER.TXT B:REPORT.TXT
```

This copies the first three files into the fourth file.

To combine several files into one file using wildcard characters:

Type: COPY *.TXT TOGETHER.TXT
Press the ENTER key.

This takes all files with an extension of TXT and combines them into a file named TOGETHER.TXT.

In the following example, each file that matches *.LST is combined with the corresponding .REF file to make a file with the same file name but with the extension .PRN.

Type: COPY *.LST + *.REF *.PRN
Press the ENTER key.

The following combines all files matching *.LST, then all files matching *.REF, into one file named COMBIN.PRN:

Type: COPY *.LST + *.REF COMBIN.PRN
Press the ENTER key.

You may wish to add information to a file that already exists, to link another file to it. This is called *appending* files. For example:

```
COPY BOOKS.LST+NEW.LST BOOKS.LST
```

The above example adds the information in NEW.LST to the information in BOOKS.LST.

BACKING UP FILES

It is imperative that all files be backed up on diskettes. If a diskette is damaged, it can be re-formatted, repaired, or replaced. The information on it cannot. However, if you periodically copy your files onto backup diskettes, the information on them is safe.

When backing up files, you can use either the DISKCOPY command to

copy an entire diskette, or the COPY command to copy an individual file or groups of files.

Data files, especially business data files, such as those from an accounting system, require a more elaborate backup. The following system is the the *least* complicated method.

1. On day 1, back up all data on a blank diskette. This diskette, or diskettes, is the Grandfather.

2. At the end of day 2, back up all data on a second blank diskette. This diskette is the Father.

3. Following the end of business on day 3, back up that day's data on the Grandfather diskette. This process will overwrite the old information with new data. This diskette is now the new Father, and the old Father becomes the Grandfather.

4. Repeat this procedure at the end of each business day.

These steps illustrate the basic sequence of a simple backup schedule for data diskettes. The worst that can happen is that two days' data will have to be reconstructed. Some companies will carry this sequence to a Son generation of backup and always keep the Grandfather in another location. The old Grandfather (new Son) is brought in each day for backup, and the old Father (new Grandfather) is removed from the premises. That way, even a fire or other catastrophe will not destroy the business records.

RENAMING FILES

To change a file name, type:

```
REN PRESENT.EXT  NEWNAME.EXT
```

If the file is on another drive, the drive letter and a colon must be given after the command, REN.

ERASING FILES

Erasing of files is done with the ERASE or DEL command. ERASE/DEL can be used whenever the A> prompt is on the screen.

To erase a file:

1. Go to the directory containing the file.
2. Type: DEL or ERASE
3. Add the file name with its file extension. Then press the ENTER key.

   Example: DEL VEHICLE.EXP

   This will erase VEHICLE.EXP from the current directory.

Wildcard characters may be used in the filename. Be careful using wildcards when erasing files. It is quite easy to delete files that you really want to keep.

LEARNING ABOUT THE STATUS OF A DISK

After the system prompt, enter the command: CHKDSK

This utility will give the following status report on a disk:

```
362496   bytes total disk space
22528    bytes in 2 hidden files
18432    bytes in 8 user files
321536   bytes available on disk
262144   bytes total memory
237568   bytes free
```

Other uses of the CHKDSK utility are itemized in the MS-DOS USER'S GUIDE.

COMBINING SEVERAL FUNCTIONS IN ONE COMMAND LINE

Command "piping" lets you give more than one command to the system at a time. You can combine normal commands, filters, and redirection into one command line. Pipes are specified with the vertical bar, (|), placed between commands.

To sort the output of the directory command and list it on the screen one screen at a time, type:

```
DIR | SORT | MORE
```

To sort the listing of the current directory and write it to a disk file (as, for example, DISK.DIR) instead of printing it on the screen, type:

```
DIR | SORT | >DISK.DIR
```

For further information, see the MS-DOS USER'S GUIDE.

EDITING COMMAND LINES

Command lines can be stored and repeated when you need them. Whenever you enter a command when the A> prompt is visible, that command is saved in a *command template*. By using the function keys on the left of the keyboard, that command can be repeated by pressing only two keys. You also can recall the command line, make changes to it, and then execute the new command line. This capability has the following advantages:

1. A command line can be easily repeated with two keystrokes.

2. Entry errors in long, complex commands can be edited without re-entering the entire command line.

3. A series of similar commands can be executed by editing the previous command instead of retyping each command.

When the A> prompt is visible, the following command line editing functions are available:

F1	<COPY1>	Redisplays the contents of the template, one character at a time.
F2	<COPYUP>	Entered by pressing F2 followed by one character. Copies from the start of the template up to the specified character.
F3	<COPYALL>	Copies all remaining characters from the template to the command line.
F4	<SKIPUP>	Entered by pressing F4 followed by one character. Skips up to, and including, the specified character

in the template. If no character is specified, F4 skips one character at a time.

F5 <NEWLINE> Makes the new, edited line the new template without executing the command.

FINDING A SEQUENCE OF CHARACTERS

To find a string of characters in specific files, use the FIND command. It has the form:

FIND /V /C /N "string" filename(s)

Press ENTER

The switch letters following the slashes are optional. Their functions are:

/V displays all lines not containing the specified string

/C prints only the count of lines containing a match in each of the files

/N precedes each line by its relative line number in the file

The string of characters must be in quotes. Type double quotes around a string that has quotes in it. When using FIND on a WordStar file be aware that WordStar writes some characters (usually the last character in a word) in a slightly different way than MS-DOS does. To use FIND with WordStar files successfully, enter every character in a given word, except the last. For example, if you were trying to FIND the word "KAYPRO", you would:

Type: FIND /N "KAYPR"
Press the enter key.

REDIRECTING INPUT AND OUTPUT

You can redirect screen output and keyboard input to and from files rather than the screen and keyboard. This *creates files* that contain information you would normally see on the screen. These files can be edited by most word processors, added to existing documents, etc.

The greater-than symbol (>) redirects output normally sent to the screen to

a file, the less-than symbol (<) redirects input.

For example, to send the directory listing to a file called MYFILES.DIR rather than to the screen, type:

```
DIR >MYFILES.DIR
```

This would overwrite any prior version of MYFILES.DIR.

To append the directory listing onto the end of MYFILES.DIR, rather than overwriting the older version, type:

```
DIR >>MYFILES.DIR
```

To sort the list of names in NAMES.DOC and then send them to your printer, type:

```
SORT <NAMES.DOC >PRN
```

See more about this in the MS-DOS USER'S GUIDE.

DISPLAYING A FILE ON SCREEN

There is a quick way to view what is in a file.

1. Get the system prompt on the screen.

2. Type: TYPE <filename>
   Press the ENTER key.

   The contents of the file will quickly scroll by.

3. To suspend the scrolling, depress the Ctrl key, and type: S

4. To continue the scrolling, press any key.

To view the contents of the file one screen at a time use the TYPE command with a program called MORE. The file MORE.COM must be on the diskette and in the directory that you are using:

Type: TYPE <filename> | MORE
Press the ENTER key.

To display another screen of information, press the ENTER key.

TURNING OFF THE CONTROL-C FUNCTION

To keep the MS-DOS Ctrl-C function from affecting a program Ctrl-C function, you can turn it off:

Type: BREAK OFF
Press the ENTER key.

When you are done with the program, turn Ctrl-C back on:
Type: BREAK ON
Press the ENTER key.

CLEARING THE SCREEN WHEN USING MS-DOS

After the system prompt:

Type: CLS
Press the ENTER key.

USING D

D is a program that tells the user exactly what files exist in specific directories, and how many kilobytes are in those files. To use D, make sure you have the file D.COM on the diskette in the drive you are using. If the file is not there you can copy it from your MS-DOS diskette. At the system prompt:

Type: D
Press the ENTER key.

Paths and drives may be specified when using D (see PATHS earlier in this manual). For example, to examine the files in a sub-directory called DATA you would:

```
Type: D \DATA ------ Sub-directory
        |  |
        |  +---------- Root directory
        |
        +-------------- Drive designation
```

CHMOD

CHMOD enables its user to change the attributes of any file or files. The four attributes are: Read only, System, Hidden, and Archive. Any file can possess one or more of these attributes.

The syntax for CHMOD is:

CHMOD D:<FILENAME.EXT> <+/-> <ATTRIBUTE>

To use CHMOD, make sure the file CHMOD.COM is on the diskette that you are currently using. If it is not, you can copy it from your MS-DOS diskette. As an example, change the file RECOVER.COM on your MS-DOS diskette to a read only file. Insert the working copy of your MS-DOS diskette in the A drive and at the system prompt:

Type: CHMOD RECOVER.COM +R
Press the ENTER key.

RECOVER.COM will become a read only file. Now change it back:

Type: CHMOD RECOVER.COM -R
Press the ENTER key.

CHMOD can be used with path and drive designations. For example, if the file D.COM were on a diskette in the B drive, in a sub-directory called DATA, and it was to be made a read only file, then you would:

Type: CHMOD B:\DATA\D.COM +R
Press the ENTER key.

"R" means read only, "S" means system, "H" means hidden and "A" means archive. A "+" sign means turn on the attribute, a "-" sign means turn it off. CHMOD itself will give instructions. At the system prompt:

Type: CHMOD
Press the ENTER key.

This help menu will be displayed:

CHMOD: List or set file attributes. Usage is:

CHMOD <files> *List attributes,*
CHMOD <files> +<attribs> *Set attributes,*
CHMOD <files> -<attribs> *Remove attributes.*

Attributes are: S == System, R == Read only, H == Hidden,
A == Archive, V == Volume ID. Volume ID cannot be changed.
Each file is listed with the new or current attributes.
The <files> specifier may be a full pathname.

ASSIGN

ASSIGN.COM is a program that assigns one drive's designation to another drive. The syntax for ASSIGN.COM is as follows:

ASSIGN <*XDRIVE*>=<*YDRIVE*>

XDRIVE is the drive designation to be assigned. *YDRIVE* is the drive to which it is now assigned.

For example, to assign the B designation to drive A, insert your MS-DOS diskette in drive A and a blank formatted diskette in drive B. From the A prompt:

Type: ASSIGN B=A
Press RETURN.

From this point on any commands to read or write to drive B will actually take place on drive A. To test it:

Type: DIR B
Press the ENTER key.

The directory listing that you see will actually be for drive A, not drive B. This program is designed to help if you install a fixed disk, and wish to run a program that uses the A and B drive only. Suppose the fixed disk is designated drive C:

Type: ASSIGN A=C B=C
Press the ENTER key.

You have assigned the A and B designations to drive C.

Do not use ASSIGN.COM with the BACKUP, RESTORE or PRINT commands. The FORMAT, DISKCOPY and DISKCOMP commands ignore drive reassignments.

SETTING THE REAL-TIME CLOCK

The KAYPRO PROFESSIONAL COMPUTER has a real time-clock--an accurate clock that keeps track of the time and date constantly. This clock is powered by the computer when the computer is on, and a lithium battery when the computer is off. The lithium battery has a life of approximately five years, and you should have your dealer replace it at that time.

There are two programs that set and access the real time clock: SETDOS.COM and SETRTC.COM

SETRTC

SETRTC.COM is a program that sets the real-time clock to the values currently held by the MS-DOS clock. SETRTC may be used in an AUTOEXEC.BAT file or from the system prompt. To use SETRTC from the system prompt:

Type: SETRTC
Press the ENTER key.

SETDOS

SETDOS.COM is a program that sets the MS-DOS clock to the values currently held by the real-time clock. If the real-time clock is not set, SETDOS prompts you for the time and date and inserts those values in both the real-time clock and the MS-DOS clock. SETDOS may be used in an AUTOEXEC.BAT file or from the system prompt. To use SETDOS from the system prompt:

Type: SETDOS
Press the ENTER key.

SWITCHING SCREEN TYPES

The KAYPRO PC, as shipped, is set for monochrome video operation. This means that the computer will work only with a monochrome monitor. For tasks such as color graphics, you may want to configure the computer to operate using an RGB or composite color monitor. To do this, you can connect a color monitor (See CONNECTING MONITORS), then run either of two programs: VSWITCH or MODE.

VSWITCH

Make sure the file VSWITCH.COM is on the diskette you are working with. If it is not, you can copy it from your MS-DOS diskette. Connect the monitor you are using to the appropriate connector (see I/O CONNECTORS in the TECHNICAL INFORMATION section). At the system prompt:

Type: VSWITCH
Press the ENTER key..

The program VSWITCH will run, you will see a display of its version number and the system prompt will return.

Once VSWITCH has been run, you can switch to color mode by:

Simultaneously pressing the CTRL, ALT, and the less-than keys.

To change back to monochrome operation:

Simultaneously press the CTRL, ALT, and the greater-than keys.

The MODE command allows you to do this from the operating system. See the following page.

THE MODE COMMAND

The MODE command enables you to change the video output from the standard monochrome display to a color display, or a black and white display. Use this command if you are using a new monitor, and you wish to configure the video output for it. MODE also enables you to change the number of columns and rows your screen displays from the standard 80 by 25, to any of several options. To use the MODE command:

Type: MODE *<DISPLAY>*
Press the ENTER key.

<DISPLAY> is where you enter the part of the command that tells the computer what type of display you wish. Below is a list of possible displays.

Command	Display
MONO	Selects monochrome, 80 columns by 24 rows.
BW40	Selects 40 by 25 black and white text mode on a color monitor.
BW80	Selects 80 by 25 black and white text mode on a color monitor.
CO40	Selects 40 by 25 color text mode.
CO80	Selects 80 by 25 color text mode.
40	Selects 40 columns in the current mode. Forty column monochrome is not available.
80	Selects 80 columns in the current mode.

For example, if you wished to switch from monochrome to color mode, and retain the same screen format, you would:

Type: MODE CO80
Press the ENTER key.

The Mode command also enables you to change the the operating mode of the parallel or serial port, and re-route the printer output. See THE MS-DOS USER'S GUIDE.

OTHER MS-DOS FEATURES

Some commands which are not covered in this user's guide but are covered in the MS-DOS USER'S GUIDE are:

AUTO EXEC.BAT	Automatic program execution file.
EDLIN	to create text or write programs
FC	to compare files
LINKER	to link object modules (for programming purposes)
PRINT	to print a text file on a printer while continuing work on the computer
PROMPT	to change the MS-DOS command prompt to, for instance, the time, date, current directory, version number
RECOVER	to recover a file or disk which has bad sectors
REM	to display remarks in a batch file
SET	to set a string value equivalent to another string
VER	to display the version number of MS-DOS
VERIFY	to change to a mode which will verify that all files are written correctly to disk

USING RAMDISK

RAMDISK is a program that partitions a section of your computer's random access memory (RAM) and uses it as if it were another diskette drive. Since the drive exists electronically the diskette access takes place at electronic speeds. A ramdisk is functionally identical to an actual diskette in an additional drive.

An example of an efficient use of a ramdisk is: Start your computer using an ordinary diskette, then COPY a large data file into the ramdisk. Set your database or spreadsheet to read the data from the ramdisk. The time the program takes to move from the beginning of the file to the end, and do calculations is decreased significantly. At the end of the work session you *must* COPY everything back to the ordinary diskette, because *when you turn off your computer, the ramdisk and everything on it ceases to exist.*

To use RAMDISK, first configure your operating system to run the program. To do this, you must create a file called CONFIG.SYS. Start your computer and insert the working copy of your MS-DOS diskette into the A drive. At the A> prompt:

1. Type: COPY CON CONFIG.SYS
   Press the ENTER key.

   The cursor will be on the far left side of the next line, with no prompt.

2. Type: DEVICE=RAMDISK.BIN kkk

   "kkk" is where you type the number of kilobytes that you wish the ramdisk to be. The standard RAM on a KAYPRO PC is 256 kilobytes, so you might want to use a quarter of it as a ramdisk. Be careful not to designate too large a ramdisk, or there will not be enough RAM for MS-DOS to function. If you type no numbers, the program will create a ramdisk of 180 kilobytes.

   Press the ENTER key.

3. Simultaneously press the CTRL and Z keys.

Press the ENTER key.

The next time you reset or start your computer, you will have a ramdisk. The drive letter designation will be the next available one. On a KAYPRO PC model 4885, the ramdisk is the C drive.

MS-DOS can only use 640 kilobytes of RAM. If your KAYPRO PC has 768 kilobytes of RAM, then RAMDISK will use the extra 128 kilobytes for the ramdisk. If you designate a ramdisk over 128 kilobytes in size, RAMDISK will use all 128 kilobytes of the extra memory, then use the regular memory.

USING KCOPY

KCOPY is a utility program that enables its user to designate specific files and directories, and copy them.

KCOPY functions within the MS-DOS system, so it is important to understand how that system is setup and in what manner it handles information. Before proceeding further look up directories and paths, the DIR, COPY, CD and MD commands, and the definition of wild cards in this manual. Use the index. Read the more extensive definitions in the MS-DOS USER'S GUIDE (In the MS-DOS USER'S GUIDE, the CD and MD commands are referred to as CHDIR and MKDIR). Pay special attention to the COPY command. Experiment: Make directories, list directories, change from directory to directory, copy a file to different directories. Use the wild cards in copying and displaying files.

KCOPY uses the same syntax as the COPY command in MS-DOS, with two important differences: KCOPY allows the user to copy a file onto itself, and, KCOPY copies *everything*. KCOPY will copy directories, the files in directories, sub-directories, the files in sub-directories, etc. If you KCOPY a complete directory tree to a blank formatted diskette, KCOPY will create directories on the blank diskette. Wherever you designate a directory to be copied, if the target diskette does not have that directory on it, KCOPY will create that directory on the target.

The KAYPRO PC has two types of video available: monochrome and color. KCOPY *must* be operated using color video.

To use KCOPY, place the working copy of your MS-DOS diskette in drive A, a blank formatted diskette in drive B, and from the root directory:

Type: KCOPY A: B:
Press the ENTER key..

This will copy all the files and directories from drive A to drive B.

Here is where KCOPY differs from COPY. KCOPY stops and allows you to select exactly which files and directories will be transferred. You will see a menu of function keys with explanations at the top of your screen, and a listing of the files in your root directory at the bottom.

THE COLUMNS

Between the list of files and the left side of the KCOPY frame there are five columns. Each column designates an attribute of the file to which it is adjacent. From left to right, the columns indicate whether files are: marked, archive system, hidden, read only or system files. If a column is blank, the file does not possess that attribute.

MARKING FILES

On the far left hand side of the KCOPY frame, you will see a column of M's. This means every file and directory is marked. If you were to start copying now, every file and every directory would be copied.

SCROLLING THROUGH FILES AND DIRECTORIES

Use the down arrow key to move down through the files, the up arrow key to move up. Pressing the PG UP key scrolls up a screen at a time, Pressing the PG DN key scrolls down. Pressing the HOME key takes the highlighted bar to the top of the list, Pressing the END key takes it to the bottom.

Another column on the right side of your screen designates the amount of kilobytes in each file. If the highlighted bar is positioned on a directory name, "- - -" will appear in the right column. When the highlighted bar is on a directory, rather than a file, pressing the right arrow key will take you into that directory. The displayed list will disappear and a list of the directory the highlighted bar was resting on will appear. This is how you mark files in a sub-directory. To return to the original directory, press the left arrow key.

THE FUNCTION KEYS

F1 MARK HIGHLIGHTED NAME FOR COPY

Use this key to mark a file or directory for copying.

ALT-F1 UNMARK HIGHLIGHTED NAME

Use this key sequence (Press the ALT key, hold it down, then press the F1 key) to un-mark a file. For example, you may wish to copy everything from one diskette to another, except for four special files. You would un-mark those files and then start the copy operation.

The same holds true for directories. Remember that if you un-mark a directory, then that directory, all the files within it, all sub-directories and the files within them, *will not be copied.*

F2 MARK ALL NAMES

This option allows you to mark every file and directory on a diskette.

ALT-F2 UNMARK ALL NAMES

This option allows you to un-mark every file and directory on a diskette. If a diskette contains many files, and you wish to copy only a few, you may want to un-mark all the files and directories, then mark the ones you wish to copy.

F3 MARK BY TYPE

This option allows you to mark names according to type. When you press F3, you see the prompt "What file type letter(s)?" There are four types: directories, hidden files, archive files, and system files.

DIRECTORIES

By entering a backslash (\), you tell KCOPY to mark only directories, not the files within them. Remember, KCOPY begins with all files marked, so to copy only a directory structure you would first unmark all files (ALT-F2), then mark by type and choose directories.

HIDDEN FILES

Mark all hidden files by entering an H.

ARCHIVE FILES

Notice the column directly to the left of the filename column. The *A* stands for archive. KCOPY is a backup program. Every time a copy operation takes place you are asked, *Clear archive bit after copying?*. Answer yes, copy a file, and the file ceases to be an archive file. The archive column appears empty. If the archive bit is to be cleared, the source diskette must not be write-protected.

SYSTEM FILES

By entering an S, you tell KCOPY to mark only the files that compose the operating system, such as MSDOS.SYS. There is a column to the left of the name column that will contain an S if the highlighted bar is currently positioned on a system file.

ALT-F3 UNMARK BY TYPE

This allows you to unmark files using the conventions described in F3 MARK BY TYPE.

F4 MARK BY PATTERN

This option allow you to mark files using wild cards (see *wild cards* in your MS-DOS USER'S GUIDE index). For example, if you wished to mark every file with a DTA extension, you would press F4, and the at the prompt:

Type: *.DTA
Press the ENTER key.

You would be asked whether or not you wish to mark files in subdirectories, then KCOPY would mark all the files with a DTA extension.

ALT-F4 UNMARK BY PATTERN

This allows you to unmark files using conventions described in F4 MARK BY PATTERN.

THE OPERATION COMMANDS

F5 START COPYING FILES

Pressing the F5 key begins the copy operation.

F6 QUIT KCOPY

Pressing the F6 key ends KCOPY and returns the system to MS-DOS.

F7 REPLACE SOURCE DISK

Pressing the F7 key enables the user to change the logged diskette drive. If you wish to switch diskettes or access another drive, use this option.

F8 TRANSFER FILES OVER DATA LINK

This option allows the user to transfer marked files and directories to another computer, through the serial port of the KAYPRO PC. KCOPY automatically sends the files, and the user should have some type of telecommunications software running on the other computer, waiting to receive the files. Set the telecommunications software on the receiving computer to the following parameters.

Protocol: XMODEM/B CRC

Baud Rate: 9600

Data Bits: 8

Stop Bit: 1

Parity: NONE

The XMODEM protocol will not allow the transfer of subdirectories or directory structures. If you wish to copy subdirectories or directory structures over a data link, you must run the KAYPRO program CATCH.EXE on the receiving computer instead of telecommunications software. At the system prompt of the receiving computer:

Type: CATCH

Press the ENTER key.

Note: The F8 option does not work with modems. It works only with a direct, computer-to-computer connection.

THE KCOPY SWITCHES

Switches are characters placed at the end of the command line that cause KCOPY to operate in a specific manner. These are the switches.

/A Copies all archive files and clears the archive bit.

/B Marks only archive files.

/C Copies all files and directories.

/M Marks according to specified wildcard pattern.

/U Unmarks according to specified wildcard pattern.

/S Allows the user to swap diskettes before KCOPY runs.

/X Copies all files and directories to a data link.

The /A, /C, and /X options bypass the KCOPY menu and start copying immediately. For example, to cause KCOPY to bypass the mark/un-mark menu and begin the copy operation immediately, place the /C "bypass switch" at the end of the command:

Type: KCOPY A:*.* C: /C
Press the ENTER key.

This command would copy every file and directory from drive A to drive C, without displaying a menu or a file and directory list.

ESCAPE AND CONTROL-C

To stop any operation at any time, press either the Escape key, or simultaneously press the control (Ctrl) and the C keys.

TECHNICAL INFORMATION

TROUBLESHOOTING

If you have difficulties when operating your KAYPRO PC, PLEASE check the following list of symptoms and remedies before calling your dealer. Of course, when programs don't do what you expect, read the manual for that program.

If the following quick checks don't fix the problem, contact your dealer for assistance with both the operation of your software and the service needed for your KAYPRO PC.

SYMPTOM: Programs won't load or execute.

PROBABLE CAUSES AND REMEDIES:

1. No AC power. Be sure that the power cord is plugged in. Check the power switch and any switches controlling the wall outlet.

2. No video display. Adjust brightness control on the monitor.

3. Drive door not closed.

4. Diskette is in drive when it is not needed.

5. Diskette in drive isn't the diskette expected by the operating program.

6. Diskette isn't in the drive correctly (label side up and the write-protect notch to the left).

7. Diskette has been damaged. Try making a copy.

...x response, incorrect

8. Incorrect response to a prompt or invalid menu selection; check for error message from program.

9. You're asking the program to do something it can't. Read the manual for that program.

SYMPTOM: Computer unexpectedly ignores keyboard entries.

PROBABLE CAUSES AND REMEDIES:

1. Fluctuations in the AC power line. Use another outlet or an External Power Conditioner. Some battery backup units will filter out noise from heavy electrical machinery as well as cover for a temporary power drop.

2. Incorrect instruction sequence. Check the appropriate manual to insure that you are using the correct operations and sequence.

3. Check the connections of keyboard to computer.

4. Turn the computer off and then back on. This will perform a keyboard reset.

MAINTENANCE

Because of the generally high reliability of modern, solid-state components, with normal use your computer should need very little maintenance or service.

It is important to keep the computer and diskettes dust-free. The computer itself can be cleaned with a damp, lint-free cloth. A mild kitchen detergent can be used, if necessary.

Care for peripheral devices, such as printers, should be covered in the manual that came with the device.

CONNECTING A PRINTER

PARALLEL PRINTER

If you have a printer with a Centronics 36-pin connector, connect your computer and your printer with a KAYPRO PC parallel printer cable (available from your dealer). Plug the Centronics end of the cable into the connection on the printer and the DB25 plug end of the cable into the DB25 socket on the rear panel of your KAYPRO.

If you have a non-standard connector on your printer or cannot find a suitable cable already assembled, the following pin assignments should prove useful to the person who fabricates your cable.

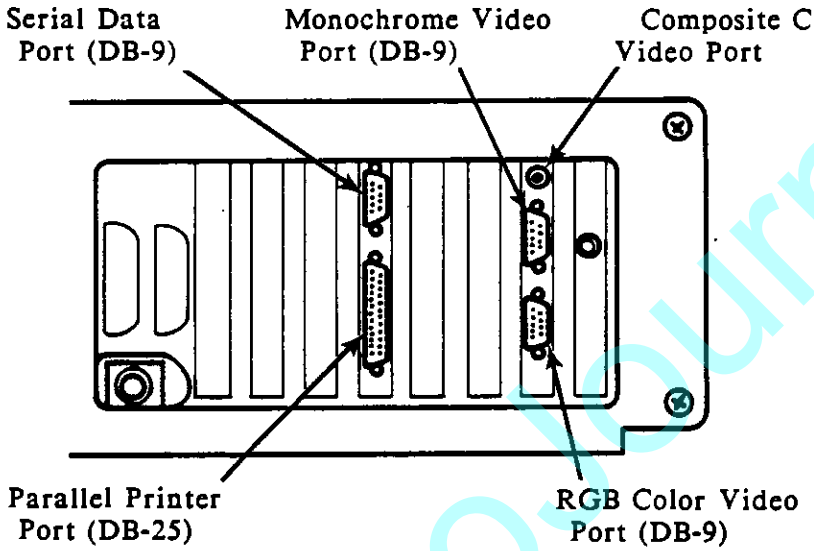
PARALLEL PRINTER CABLE

DB25 CONNECTOR (KAYPRO) PIN	SIGNAL	CENTRONICS (PRINTER) PIN
1	STROBE	1
2	DATA 0	2
3	DATA 1	3
4	DATA 2	4
5	DATA 3	5
6	DATA 4	6
7	DATA 5	7
8	DATA 6	8
9	DATA 7	9
10	ACKNOWLEDGE	10
11	BUSY	11
12	PAPER END	12
13	SELECT	13
14	AUTO FEED	14
15	FAULT	32
16	INITIATE	31
17	SELECT IN	36
18	GROUND	34
19	GROUND	19
20	GROUND	21
21	GROUND	23
22	GROUND	25
23	GROUND	27
24	GROUND	29
25	GROUND	30

NOTE: ALL CABLES USED ON THE KAYPRO PC MUST BE SHIELDED IN ORDER TO COMPLY WITH FCC REGULATIONS.

I/O CONNECTORS

The following figure should be used as reference for the I/O interface between the KAYPRO PC computer and any peripherals you use.



INSTALLING CIRCUIT CARDS

A circuit card is a fiberglass or plastic board with integrated circuits and electronic pathways embedded in it. Each card performs a specific function. One might be a 1200 baud modem, while another might provide color graphics. Circuit cards are placed inside the KAYPRO PC in circuit card slots. There are six empty circuit card slots in the KAYPRO PC: three for full length cards, and three for half length cards.

INSTALLING CARDS

Installing a card is a fairly simple procedure, however, the installation does involve working with some delicate parts of the KAYPRO PC. If you have any qualms about working with electronic circuitry, you may want to have a qualified electronics technician do any installation. *TURN THE COMPUTER OFF*, then begin by removing the computer cover.

1. Prepare the work surface and tools. You should have a wide clear table that does not move or jar easily, and allows easy access to both the front and rear panels of the computer. You will need a #2 phillips screwdriver. Have a small dish or cup ready to hold the screws that you will be removing and replacing during the installation.

2. Disconnect monitor and remove it. Disconnect all cables connected to the computer.

3. Place the computer on the work surface.

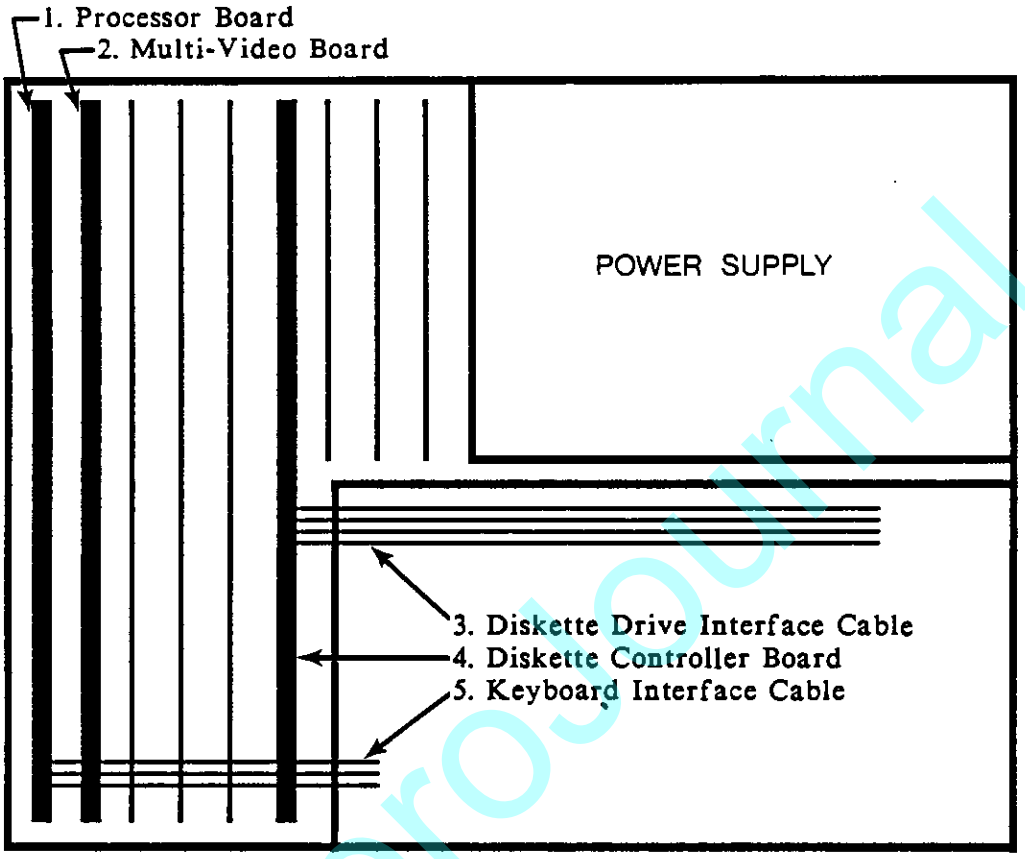
4. Remove the five screws (type 4M8) that hold the rear panel in place.

5. While facing the front of the computer, carefully slide the cover toward you. *IMPORTANT:* make sure that the center retainer tab which is located inside the center portion of the cover, does not snag the floppy disk interface cable as you remove the cover.

6. Slide the cover forward until it will slide no further, move it back slightly (1/2 an inch) and rotate the front upward and away.

7. Put the cover aside.

THE KAYPRO PC INTERNAL CONFIGURATION



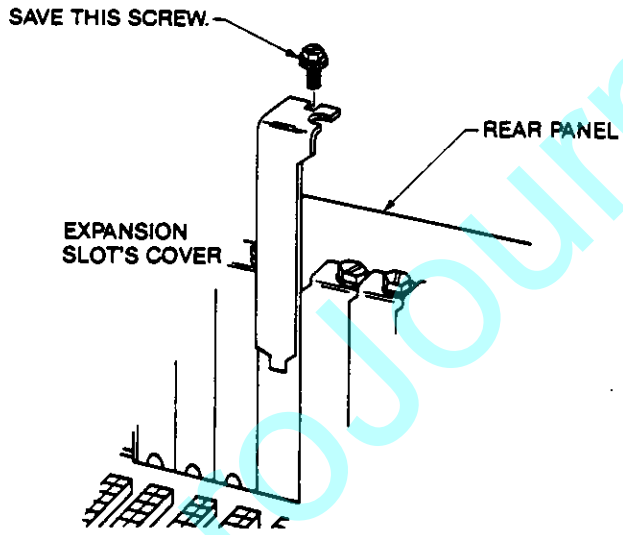
Many circuit cards contain static sensitive devices which can be damaged or destroyed by static electricity discharge. Circuit cards are usually shipped in anti-static containers to prevent this. To avoid damaging your circuit card, attach a grounding wrist strap to one wrist and attach the drain lead to an electrical ground. The strap and drain lead may be purchased at most electronics hobby stores.

The KAYPRO PC has nine circuit card slots, located in the upper left portion of the computer. Three of them are occupied by the integral circuitry of the computer. The layout, from left to right, is: the processor board, the multi-video board, three empty full length slots, the floppy diskette controller board, and three empty half length slots. To install a circuit card:

1. Open the circuit card package. Find, read and follow any instructions provided with the card. If it is a full length card, install it in a full length slot, install a half length card in a half length slot.

2. If you are installing a full length card, locate the keyboard interface cable(5), where it connects to the processor board(1). Disconnect the keyboard cable from the processor board and move it out of the way of the circuit card slots.

3. Remove the expansion slot cover screw, as shown.



3. Carefully remove the board from its anti-static bag.

4. Holding the board by the extreme top edge, carefully insert the board into the slot. If the board is full length, make sure the far end of the board is in the appropriate support bracket. Use the board located in the first slot as a guide.

5. Replace the screw you removed in step three.

6. Replace the computer cover by reversing the previously described procedure.

SERIAL DEVICES

Your KAYPRO PC was designed to be as easy to use as possible. The standard expanded system consists of your computer connected to a monitor and a standard parallel printer via the parallel connector. This leaves the serial connector on the rear panel open for serial devices such as modems and serial printers.

The modem cable and the serial printer cable are not interchangeable. If you want to use both a modem and a serial printer, it will be necessary to have two different cables available.

Please note that Kaypro Corporation makes no guarantees about the suitability of a given serial device for use with the KAYPRO PC serial interface. Before you purchase any serial device, insist on a demonstration of its operation.

If you want to connect your KAYPRO PC to a serial device, your dealer should be able to supply you with the correct cable. If the proper cable is not available through your dealer, the following pin-assignment information should be useful to the person who fabricates the cable.

THE RS-232C SERIAL PORT

KAYPRO PC SERIAL PORT PIN ASSIGNMENTS
(PRIMARY ASYNCHRONOUS COMMUNICATIONS)

DB9S CONNECTOR PIN	SIGNAL
1	DATA SET READY
2	TRANSMIT DATA
3	CLEAR TO SEND
4	RECEIVE DATA
5	SIGNAL GROUND
6	DATA TERMINAL READY
7	CARRIER DETECT
8	REQUEST TO SEND
9	RING DETECT

SERIAL PRINTER CABLE (DCE)

DB9S CONNECTOR (KAYPRO) PIN	SIGNAL	RS-232-C (PRINTER) PIN
1	DATA SET READY	20
2	TRANSMIT DATA	3
3	CLEAR TO SEND	4
4	RECEIVE DATA	2
5	SIGNAL GROUND	7
6	DATA TERMINAL READY	8
7	CARRIER DETECT	6
8	REQUEST TO SEND	5
9	RING DETECT	22

SERIAL MODEM CABLE (DTE)

DB9S CONNECTOR (KAYPRO) PIN	SIGNAL	RS-232-C (MODEM) PIN
1	DATA SET READY	6
2	TRANSMIT DATA	2
3	CLEAR TO SEND	5
4	RECEIVE DATA	3
5	SIGNAL GROUND	7
6	DATA TERMINAL READY	20
7	CARRIER DETECT	8
8	REQUEST TO SEND	4
9	RING DETECT	22

CONNECTING MONITORS

Before connecting any type of monitor to the KAYPRO PC refer to the section titled I/O CONNECTORS and note the position of each type of connector. The serial port on your computer has a DB-9 female connector, and looks exactly the same as the DB-9 connectors used for the RGB and monochrome output. Although the connectors are the same type, they perform entirely different functions and are *NOT* interchangeable.

MONOCHROME MONITORS

The KAYPRO PROFESSIONAL COMPUTER Model 4885 comes equipped with an external monochrome monitor. Instructions for connecting it to the computer are included in the section titled SETTING UP YOUR KAYPRO PC.

RGB COLOR MONITORS

RGB is an acronym for red-green-blue, and denotes the type of monitor being used. An RGB color monitor displays high resolution color graphics and is used for many modern business applications. To connect an RGB monitor to to the KAYPRO PC, read and follow the instructions for your particular monitor, and connect it to the RGB color video port on the rear panel of the computer (see I/O CONNECTORS).

COMPOSITE MONITORS

A composite video monitor displays medium to low resolution color graphics. A color television set can be used as a composite monitor with the addition of a device called an *RF modulator*, available from your dealer.

CONFIGURING THE COMPUTER

The KAYPRO PC is shipped set for monochrome video operation. It is possible to use your software to change the the video display type, but this

can be accomplished *only after the computer is on.* You may wish to write an AUTOEXEC.BAT file that executes the MODE command and changes the display type when ever the computer starts or is reset You may wish to run the program VSWITCH, which allows you to switch screen types by pressing a sequence of keys. Both of these are software solutions and are described in the section titled SWITCHING SCREEN TYPES. To change the setup of the hardware--the computer itself--you must change a switch setting on the processor board inside the computer.

Changing the switch setting is a fairly simple procedure, but it does involve working with some delicate parts of the KAYPRO PC. If you are not mechanically inclined, or have any qualms about working with electronic circuitry, you may want to have a qualified electronics technician change the setting. Begin by *TURNING THE COMPUTER OFF*, then removing the computer cover.

1. Prepare the work surface and tools. You should have a wide clear table that does not move or jar easily, and allows easy access to both the front and rear panels of the computer. You will need a #2 phillips screwdriver. Have a small dish or cup ready to hold the screws that you will be removing and replacing during the installation.

2. Disconnect monitor and remove it. Disconnect all cables connected to the computer.

3. Place the computer on the work surface.

4. Remove the five screws that hold the rear panel in place.

5. While facing the front of the computer, carefully slide the cover toward you. *IMPORTANT:* make sure that the center retainer tab which is located inside the center portion of the cover, does not snag the floppy disk interface cable as you remove the cover.

6. Slide the cover forward until it will slide no further, move it back slightly (1/2 an inch) and rotate the front upward and away.

7. Put the cover aside.

8. Refer to the section titled THE INTERNAL CONFIGURATION OF THE KAYPRO PC and note the position of the processor board (1). This is the board you will remove. Note also the position of the keyboard interface cable (5).

9. Disconnect the keyboard interface cable from the processor board.

10. The processor board has a metal bracket at one end that is affixed to the chassis of the computer with a single phillips head screw. Remove this screw.

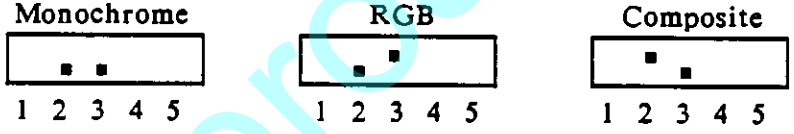
11. Grip the processor board at each end, using the thumb and forefinger of each hand. Grasp only the board itself, not the integrated circuits or components on the board.

12. Lift the processor board out of the computer by lifting it up with a gentle back and forth rocking motion.

4

13. Once the board is removed place it on a *non-magnetic, anti-static* surface, like a rubber mat. Position it so that the metal bracket is to the right and the copper colored connector is in the lower right portion of the board.

14. In the upper right portion of the board you will see a bank of five switches, numbered one through five. Switches two and three of this bank control the type of video signals the computer sends. Change the setting of switches two and three to match the type of monitor you are using. *Change switches two and three only*, the other switches must remain as they are. See the illustrations below.



15. Once you have changed the switch settings, re-install the processor board by reversing the previously described procedure. *Do not forget to connect the keyboard interface cable.*

VIDEO CONNECTORS

There are three video output connectors: one for an RGB color monitor, one for a monochrome monitor and one for a composite monitor. These connectors are located on the rear panel of the computer near the parallel and serial connectors.

The RGB and monochrome connectors both use a nine pin connector and the cables for each appear very similar. *They are not interchangeable!*

Though the RGB and monochrome video cables may be appear the same, internally they are very different.

The video connector used with an external composite video monitor is located below the RGB and monochrome video connectors on the rear panel of the computer. It uses a standard composite video cable available through your dealer.

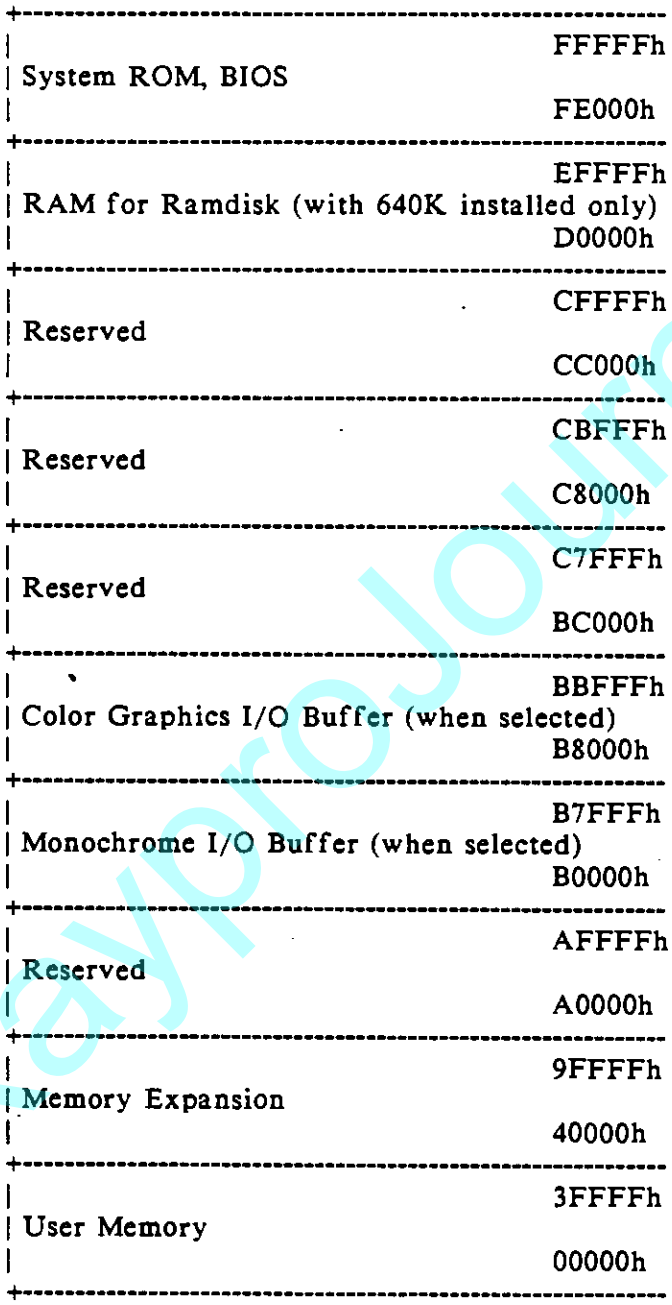
RGB VIDEO CONNECTOR PIN ASSIGNMENTS

1	Ground
2	Ground
3	Red Input
4	Green Input
5	Blue Input
6	Intensity
7	No Connection
8	Horizontal Sync.
9	Vertical Sync.

MONOCHROME VIDEO CONNECTOR PIN ASSIGNMENTS

MONOCHROME MONITOR, CONNECTOR PIN	ASSIGNMENT
1	Ground
2	Ground
3	Not Connected
4	Not Connected
5	Not Connected
6	Intensity
7	Video
8	Horizontal
9	Vertical

MEMORY MAP OF THE KAYPRO PC COMPUTER



I/O PORT ADDRESSES

PORT # (HEX)	DEVICE/FUNCTION
000-00F	DMA Chip 8237A-5
020-021	Interrupt 8259A
040-043	Timer 8253-5
060-063	PPI 8255A-5
080-083	DMA Page Registers
0A0-0AF	NMI Mask Register
170-171	Real-Time Clock and CMOS Register
2F8-2FF	Asynchronous Communications (Secondary)
320-32F	Hard Disk
378-37F	Parallel Printer
3B0-3BF	Monochrome (when selected)
3D0-3DF	Color/Graphics (when selected)
3F0-3F7	Floppy Diskette
3F8-3FF	Asynchronous Communications (Primary)

GLOSSARY

ADDRESS	a number used by the computer to keep track of different memory locations
ARCHIVE FILE	a file that has not been copied (by a backup program) since it was last changed. Archive files are usually data files that are changed every day, however, any file can be an archive file.
ARRAY	a set of elements arranged in a pattern
ASCII	acronym for American Standard Code for Information Interchange; a 7-bit code for representing character data, such as letters, punctuation, etc.
BACK UP	to copy information or programs as a protective measure
BAUD RATE	the number of signal level changes per second in a serial transmission
BIT	a binary digit, the smallest piece of information a computer can handle (see BYTE)
BIT RATE	number of bits transmitted per second
BOOT	loading the operating system into memory Cold boot occurs when the machine is first turned on. It may also be reloaded while the computer is on by pressing the Ctrl-Alt-Del keys.
BUFFER	an area of memory set aside for storing and manipulating data associated with I/O devices, such as disks and keyboards
BUG	a problem or undesirable side-effect of a computer program, almost always unexpected and unwelcome (see DEBUG)
BYTE	8 bits; the size of a memory location in the KAYPRO. A

	kilobyte or kbyte is 1024 bytes
CHIP	slang for an integrated circuit
CONSOLE	the device used for communication between the computer and you. Normally, this is the keyboard and the video display.
CPU	acronym for Central Processing Unit: the microprocessor chip
CRT	acronym for Cathode Ray Tube: the "TV" tube used as the video display
DEBUG	to remove mistakes from a computer program (see BUG)
DIR	a built-in MS-DOS command that lists files
DIRECTORY	a listing of files
FILE	a collection of related information, either data, text or instructions stored on a magnetic surface (diskette or fixed disk drive) and given a specific name.
FILENAME	the name of a file. You see the file name when you list the directory or use it to access a file. The general form for a filename is: B:NAME.EXT. The first part (A: or C:) indicates which drive the file is in. The second part is the name and can be up to eight characters long. The last part is called the file extension, can be up to three characters long, and is separated from the name by a period.
FLOPPY	a diskette of magnetic media which is encased in a sturdy envelope
FORMAT	the organization of data on a disk. A double-sided, double-density format on the diskette consists of 80 tracks per disk, with each track divided into 9 sectors
HARD DISK	a fixed, durable disk for storing information magnetically. It is permanently located within the computer.
HARDWARE	the physical parts of the computer and its peripheral equipment, as opposed to SOFTWARE.

HIGH-LEVEL LANGUAGE	a computer programming language that is similar to English or mathematics. BASIC and PASCAL, for example, are high-level languages.
INPUT	data put into the computer. By extension, the process or means of putting data into the computer.
LOAD	to take information from a storage medium, such as a diskette or tape, and put it into the computer's memory.
MACHINE LANGUAGE	a binary computer language, as opposed to either assembly language (see your MS-DOS PROGRAMMERS REFERENCE) or high-level languages like BASIC.
MEMORY	electronic storage of data. Done in ROM (Read Only Memory) and RAM (Random Access Memory) and on the fixed disk and diskettes.
MODEM	acronym for MOdulation/DEModulation: a device that connects a computer terminal to another computer terminal via a communications link, such as the telephone system.
MS-DOS	acronym for Microsoft Disk Operating System. The disk operating system for 8088 and 8086 microcomputers.
OPERATING SYSTEM	the operating system manages memory locations, details of disk and printer input and output, and any other peripherals. Manages details of which file is which, where it is, and how to access the one you want.
OUTPUT	information displayed or used to control devices external to a computer. By extension, the process or means of getting information out of a computer.
PERIPHERAL	any device connected to and used with your computer, such as a printer or modem.
PIXEL	an element or location on the screen for the purpose of forming characters or graphic displays

PROGRAM — a set of instructions for a computer; the SOFTWARE. When these instructions are in a high-level language like BASIC, they will always have to be converted into a set of low-level or machine language instructions by either an interpreter (GW-BASIC) or a compiler (COBOL, FORTRAN, PASCAL, etc).

PROMPT — a symbol or message displayed by a program to inform the user that the program requires some instruction or information. In MS-DOS, the A> is a prompt which indicates that the computer is waiting for the user to enter a command.

RAM — acronym for Random Access Memory; the memory that the computer uses for short-term storage of information and programs. Unlike ROM, the information stored in RAM is changeable and volatile, meaning it will disappear when the power to the computer is turned off. RAM can be read from and written to.

ROM — acronym for Read Only Memory; the memory that is used for unchanging information and programs. Information stored in ROM is not volatile, and will remain intact regardless of whether the power to the computer is on or off.

A program in ROM tests the computer when it is turned on; then, if everything is OK, it loads the operating system. Read Only Memory also contains the instructions needed for the hardware and software to talk to each other.

SAFETY ZONE — a portion of a fixed disk which is reserved as a space to which the read-write head can move when it has nothing else to do.

SECTOR — a group of bytes on a disk. The standard MS-DOS 2.1 double-density floppy disk has 9 sectors on each track, with each sector containing 512 bytes of information.

SOFTWARE — the programs which make it possible for a user to operate a piece of computer equipment

SYSTEM PROGRAMS	the MS-DOS operating system has two kinds of programs, internal programs and external programs. Internal programs exist inside of COMMAND.COM and do not appear on directory listings. They load into memory when your computer is started. A discussion of all the internal programs is contained in the KAYPRO MS-DOS USER'S GUIDE.
TRACK	a ring of information on a disk. A double-sided diskette has 80 tracks.
UTILITY	a program often used, particularly by programmers. For example, FORMAT.COM is a utility program (details in the MS-DOS manual) that allows the formatting of floppy diskettes.

ASCII CHART WITH TEXT ATTRIBUTES

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
00	0	Blank (Null)	Ctrl 2		Black	Black	Non-Display
01	1	☺	Ctrl A		Black	Blue	Underline
02	2	☻	Ctrl B		Black	Green	Normal
03	3	♥	Ctrl C		Black	Cyan	Normal
04	4	♦	Ctrl D		Black	Red	Normal
05	5	♣	Ctrl E		Black	Magenta	Normal
06	6	♠	Ctrl F		Black	Brown	Normal
07	7	•	Ctrl G		Black	Light Grey	Normal
08	8	■	Ctrl H, Backspace, Shift Backspace		Black	Dark Grey	Non-Display
09	9	○	Ctrl I		Black	Light Blue	High Intensity Underline
0A	10	◙	Ctrl J, Ctrl↵		Black	Light Green	High Intensity
0B	11	♂	Ctrl K		Black	Light Green	High Intensity
0C	12	♀	Ctrl L,		Black	Light Red	High Intensity
0D	13	♪	Ctrl M, ↵, Shift↵		Black	Light Magenta	High Intensity
0E	14	♫	Ctrl N		Black	Yellow	High Intensity
0F	15	☼	Ctrl O		Black	White	High Intensity
10	16	►	Ctrl P		Blue	Black	Normal
11	17	◄	Ctrl Q		Blue	Blue	Underline
12	18	↕	Ctrl R		Blue	Green	Normal
13	19	‼	Ctrl S		Blue	Cyan	Normal
14	20	¶	Ctrl T		Blue	Red	Normal
15	21	§	Ctrl U			Magenta	Normal
16	22	▬	Ctrl V		Blue	Brown	Normal
17	23	↨	Ctrl W		Blue	Light Grey	Normal

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
18	24	↑	Ctrl X		Blue	Dark Grey	High Intensity
19	25	↓	Ctrl Y		Blue	Light Blue	High Intensity Underline
1A	26	→	Ctrl Z		Blue	Light Green	High Intensity
1B	27	←	Ctrl [, Esc, Shift Esc, Ctrl Esc		Blue	Light Cyan	High Intensity
1C	28	∟	Ctrl \		Blue	Light Red	High Intensity
1D	29	↔	Ctrl]		Blue	Light Magenta	High Intensity
1E	30	▲	Ctrl 6		Blue	Yellow	High Intensity
1F	31	▼	Ctrl —		Blue	White	High Intensity
20	32	Blank Space	Space Bar, Shift, Space, Ctrl Space, Alt Space		Green	Black	Normal
21	33	!	!	Shift	Green	Blue	Underline
22	34	"	"	Shift	Green	Green	Normal
23	35	#	#	Shift	Green	Cyan	Normal
24	36	$	$	Shift	Green	Red	Normal
25	37	%	%	Shift	Green	Magenta	Normal
26	38	&	&	Shift	Green	Brown	Normal
27	39	'	'		Green	Light Grey	Normal
28	40	(	(	Shift	Green	Dark Grey	High Intensity
29	41	)	)	Shift	Green	Light Blue	High Intensity Underline
2A	42	*	*	Note 1	Green	Light Green	High Intensity
2B	43	+	+	Shift	Green	Light Cyan	High Intensity
2C	44	,	,		Green	Light Red	High Intensity
2D	45	—	—		Green	Light Magenta	High Intensity
2E	46	.	.	Note 2	Green	Yellow	High Intensity

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
2F	47	/	/		Green	White	High Intensity
30	48	0	0	Note 3	Cyan	Black	Normal
31	49	1	1	Note 3	Cyan	Blue	Underline
32	50	2	2	Note 3	Cyan	Green	Normal
33	51	3	3	Note 3	Cyan	Cyan	Normal
34	52	4	4	Note 3	Cyan	Red	Normal
35	53	5	5	Note 3	Cyan	Magenta	Normal
36	54	6	5	Note 3	Cyan	Brown	Normal
37	55	7	7	Note 3	Cyan	Light Grey	Normal
38	56	8	8	Note 3	Cyan	Dark Grey	High Intensity
39	57	9	9	Note 3	Cyan	Light Blue	High Intensity Underline
3A	58	:	:	Shift	Cyan	Light Green	High Intensity
3B	59	;	;		Cyan	Light Cyan	High Intensity
3C	60	<	<	Shift	Cyan	Light Red	High Intensity
3D	61	=	=		Cyan	Light Magenta	High Intensity
3E	62	>	>	Shift	Cyan	Yellow	High Intensity
3F	63	?	?	Shift	Cyan	White	High Intensity
40	64	@	@	Shift	Red	Black	Normal
41	65	A	A	Note 4	Red	Blue	Underline
42	66	B	B	Note 4	Red	Green	Normal
43	67	C	C	Note 4	Red	Cyan	Normal
44	68	D	D	Note 4	Red	Red	Normal
45	69	E	E	Note 4	Red	Magenta	Normal
46	70	F	F	Note 4	Red	Brown	Normal
47	71	G	G	Note 4	Red	Light Grey	Normal
48	72	H	H	Note 4	Red	Dark Grey	High Intensity
49	73	I	I	Note 4	Red	Light Blue	High Intensity Underline
4A	74	J	J	Note 4	Red	Light Green	High Intensity

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
4B	75	K	K	Note 4	Red	Light Cyan	High Intensity
4C	76	L	L	Note 4	Red	Light Red	High Intensity
4D	77	M	M	Note 4	Red	Light Magenta	High Intensity
4E	78	N	N	Note 4	Red	Yellow	High Intensity
4F	79	O	O	Note 4	Red	White	High Intensity
50	80	P	P	Note 4	Magenta	Black	Normal
51	81	Q	Q	Note 4	Magenta	Blue	Underline
52	82	R	R	Note 4	Magenta	Green	Normal
53	83	S	S	Note 4	Magenta	Cyan	Normal
54	84	T	T	Note 4	Magenta	Red	Normal
55	85	U	U	Note 4	Magenta	Magenta	Normal
56	86	V	V	Note 4	Magenta	Brown	Normal
57	87	W	W	Note 4	Magenta	Light Grey	Normal
58	88	X	X	Note 4	Magenta	Dark Grey	High Intensity
59	89	Y	Y	Note 4	Magenta	Light Blue	High Intensity Underline
5A	90	Z	Z	Note 4	Magenta	Light Green	High Intensity
5B	91	[	[		Magenta	Light Cyan	High Intensity
5C	92	\	\		Magenta	Light Red	High Intensity
5D	93	]	]		Magenta	Light Magenta	High Intensity
5E	94	^	^	Shift	Magenta	Yellow	High Intensity
5F	95	—	—	Shift	Magenta	White	High Intensity
60	96	`	`		Yellow	Black	Normal
61	97	a	a	Note 5	Yellow	Blue	Underline
62	98	b	b	Note 5	Yellow	Green	Normal
63	99	c	c	Note 5	Yellow	Cyan	Normal
64	100	d	d	Note 5	Yellow	Red	Normal
65	101	e	e	Note 5	Yellow	Magenta	Normal
66	102	f	f	Note 5	Yellow	Brown	Normal

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
67	103	g	g	Note 5	Yellow	Light Grey	Normal
68	104	h	h	Note 5	Yellow	Dark Grey	High Intensity
69	105	i	i	Note 5	Yellow	Light Blue	High Intensity Underline
6A	106	j	j	Note 5	Yellow	Light Green	High Intensity
6B	107	k	k	Note 5	Yellow	Light Cyan	High Intensity
6C	108	l	l	Note 5	Yellow	Light Red	High Intensity
6D	109	m	m	Note 5	Yellow	Light Magenta	High Intensity
6E	110	n	n	Note 5	Yellow	Yellow	High Intensity
6F	111	o	o	Note 5	Yellow	White	High Intensity
70	112	p	p	Note 5	White	Black	Reverse Video
71	113	q	q	Note 5	White	Blue	Underline
72	114	r	r	Note 5	White	Green	Normal
73	115	s	s	Note 5	White	Cyan	Normal
74	116	t	t	Note 5	White	Red	Normal
75	117	u	u	Note 5	White	Magenta	Normal
76	118	v	v	Note 5	White	Brown	Normal
77	119	w	w	Note 5	White	Light Grey	Normal
78	120	x	x	Note 5	White	Dark Grey	Reverse Video
79	121	y	y	Note 5	White	Light Blue	High Intensity Underline
7A	122	z	z	Note 5	White	Light Green	High Intensity
7B	123	{	{	Shift	White	Light Cyan	High Intensity
7C	124	¦	¦	Shift	White	Light Red	High Intensity
7D	125	}	}	Shift	White	Light Magenta	High Intensity
7E	126	~	~	Shift	White	Yellow	High Intensity
7F	127	⌂	Ctrl —		White	White	High Intensity

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
■ ■ 80 to FF Hex are Flashing in both Color and Monochrome ■ ■							
80	128	Ç	Alt 128	Note 6	Black	Black	Non-Display
81	129	ü	Alt 129	Note 6	Black	Blue	Underline
82	130	é	Alt 130	Note 6	Black	Green	Normal
83	131	â	Alt 131	Note 6	Black	Cyan	Normal
84	132	ä	Alt 132	Note 6	Black	Red	Normal
85	133	à	Alt 133	Note 6	Black	Magenta	Normal
86	134	å	Alt 134	Note 6	Black	Brown	Normal
87	135	ç	Alt 135	Note 6	Black	Light Grey	Normal
88	138	ê	Alt 138	Note 6	Black	Dark Grey	Non-Display
89	137	ë	Alt 137	Note 6	Black	Light Blue	High Intensity Underline
8A	138	è	Alt 138	Note 6	Black	Light Green	High Intensity
8B	139	ï	Alt 139	Note 6	Black	Light Cyan	High Intensity
8C	140	î	Alt 140	Note 6	Black	Light Red	High Intensity
8D	141	ì	Alt 141	Note 6	Black	Light Magenta	High Intensity
8E	142	Ä	Alt 142	Note 6	Black	Yellow	High Intensity
8F	143	Å	Alt 143	Note 6	Black	White	High Intensity
90	144	É	Alt 144	Note 6	Blue	Black	Normal
91	145	æ	Alt 145	Note 6	Blue	Blue	Underline
92	146	Æ	Alt 146	Note 6	Blue	Green	Normal
93	147	ô	Alt 147	Note 6	Blue	Cyan	Normal
94	148	ö	Alt 148	Note 6	Blue	Red	Normal
95	149	ò	Alt 149	Note 6	Blue	Magenta	Normal
96	150	û	Alt 150	Note 6	Blue	Brown	Normal
97	151	ù	Alt 151	Note 6	Blue	Light Grey	Normal
98	152	ÿ	Alt 152	Note 6	Blue	Dark Grey	High Intensity
99	153	ö	Alt 153	Note 6	Blue	Light Blue	High Intensity Underline
9A	154	ü	Alt 154	Note 6	Blue	Light Green	High Intensity

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
9B	155	¢	Alt 155	Note 6	Blue	Light Cyan	High Intensity
9C	156	£	Alt 156	Note 6	Blue	Light Red	High Intensity
9D	157	¥	Alt 157	Note 6	Blue	Light Magenta	High Intensity
9E	158	Pt	Alt 158	Note 6	Blue	Yellow	High Intensity
9F	159	ƒ	Alt 159	Note 6	Blue	White	High Intensity
A0	160	á	Alt 160	Note 6	Green	Black	Normal
A1	161	í	Alt 161	Note 6	Green	Blue	Underline
A2	162	ó	Alt 162	Note 6	Green	Green	Normal
A3	163	ú	Alt 163	Note 6	Green	Cyan	Normal
A4	164	ñ	Alt 164	Note 6	Green	Red	Normal
A5	165	Ñ	Alt 165	Note 6	Green	Magenta	Normal
A6	166	ª	Alt 166	Note 6	Green	Brown	Normal
A7	167	º	Alt 167	Note 6	Green	Light Grey	Normal
A8	168	¿	Alt 168	Note 6	Green	Dark Grey	High Intensity
A9	169	⌐	Alt 169	Note 6	Green	Light Blue	High Intensity Underline
AA	170	¬	Alt 170	Note 6	Green	Light Green	High Intensity
AB	171	½	Alt 171	Note 6	Green	Light Cyan	High Intensity
AC	172	¼	Alt 172	Note 6	Green	Light Red	High Intensity
AD	173	¡	Alt 173	Note 6	Green	Light Magenta	High Intensity
AE	174	<<	Alt 174	Note 6	Green	Yellow	High Intensity
AF	175	>>	Alt 175	Note 6	Green	White	High Intensity
B0	176	▒	Alt 176	Note 6	Cyan	Black	Normal
B1	177	▒	Alt 177	Note 6	Cyan	Blue	Underline
B2	178	▓	Alt 178	Note 6	Cyan	Green	Normal
B3	179	│	Alt 179	Note 6	Cyan	Cyan	Normal
B4	180	┤	Alt 180	Note 6	Cyan	Red	Normal
B5	181	╡	Alt 181	Note 6	Cyan	Magenta	Normal
B6	182	╢	Alt 182	Note 6	Cyan	Brown	Normal

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
B7	183		Alt 183	Note 6	Cyan	Light Grey	Normal
B8	184		Alt 184	Note 6	Cyan	Dark Grey	High Intensity
B9	185		Alt 185	Note 6	Cyan	Light Blue	High Intensity Underline
BA	186		Alt 186	Note 6	Cyan	Light Green	High Intensity
BB	187		Alt 187	Note 6	Cyan	Light Cyan	High Intensity
BC	188		Alt 188	Note 6	Cyan	Light Red	High Intensity
BD	189		Alt 189	Note 6	Cyan	Light Magenta	High Intensity
BE	190		Alt 190	Note 6	Cyan	Yellow	High Intensity
BF	191		Alt 191	Note 6	Cyan	White	High Intensity
C0	192		Alt 192	Note 6	Red	Black	Normal
C1	193		Alt 193	Note 6	Red	Blue	Underline
C2	194		Alt 194	Note 6	Red	Green	Normal
C3	195		Alt 195	Note 6	Red	Cyan	Normal
C4	196		Alt 196	Note 6	Red	Red	Normal
C5	197		Alt 197	Note 6	Red	Magenta	Normal
C6	198		Alt 198	Note 6	Red	Brown	Normal
C7	199		Alt 199	Note 6	Red	Light Grey	Normal
C8	200		Alt 200	Note 6	Red	Dark Grey	High Intensity
C9	201		Alt 201	Note 6	Red	Light Blue	High Intensity Underline
CA	202		Alt 202	Note 6	Red	Light Green	High Intensity
CB	203		Alt 203	Note 6	Red	Light Cyan	High Intensity
CC	204		Alt 204	Note 6	Red	Light Red	High Intensity
CD	205		Alt 205	Note 6	Red	Light Magenta	High Intensity
CE	206		Alt 206	Note 6	Red	Yellow	High Intensity
CF	207		Alt 207	Note 6	Red	White	High Intensity
D0	208		Alt 208	Note 6	Magenta	Black	Normal

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
D1	209	═	Alt 209	Note 6	Magenta	Blue	Underline
D2	210	╥	Alt 210	Note 6	Magenta	Green	Normal
D3	211	╙	Alt 211	Note 6	Magenta	Cyan	Normal
D4	212	╘	Alt 212	Note 6	Magenta	Red	Normal
D5	213	╒	Alt 213	Note 6	Magenta	Magenta	Normal
D6	214	╓	Alt 214	Note 6	Magenta	Brown	Normal
D7	215	╫	Alt 215	Note 6	Magenta	Light Grey	Normal
D8	216	╪	Alt 216	Note 6	Magenta	Dark Grey	High Intensity
D9	217	┘	Alt 217	Note 6	Magenta	Light Blue	High Intensity Underline
DA	218	┌	Alt 218	Note 6	Magenta	Light Green	High Intensity
DB	219	■	Alt 219	Note 6	Magenta	Light Cyan	High Intensity
DC	220	▄	Alt 220	Note 6	Magenta	Light Red	High Intensity
DD	221	▌	Alt 221	Note 6	Magenta	Light Magenta	High Intensity
DE	222	▐	Alt 222	Note 6	Magenta	Yellow	High Intensity
DF	223	▀	Alt 223	Note 6	Magenta	White	High Intensity
E0	224	α	Alt 224	Note 6	Yellow	Black	Normal
E1	225	ß	Alt 225	Note 6	Yellow	Blue	Underline
E2	226	Γ	Alt 226	Note 6	Yellow	Green	Normal
E3	227	π	Alt 227	Note 6	Yellow	Cyan	Normal
E4	228	Σ	Alt 228	Note 6	Yellow	Red	Normal
E5	229	σ	Alt 229	Note 6	Yellow	Magenta	Normal
E6	230	µ	Alt 230	Note 6	Yellow	Brown	Normal
E7	231	τ	Alt 231	Note 6	Yellow	Light Grey	Normal
E8	232	Φ	Alt 232	Note 6	Yellow	Dark Grey	High Intensity
E9	233	θ	Alt 233	Note 6	Yellow	Light Blue	High Intensity Underline
EA	234	Ω	Alt 234	Note 6	Yellow	Light Green	High Intensity
EB	235	δ	Alt 235	Note 6	Yellow	Light Cyan	High Intensity

Value		As Characters			As Text Attributes		
					Color/Graphics Monitor		Monochrome Monitor
Hex	Dec	Symbol	Keystrokes	Modes	Background	Foreground	
EC	236	∞	Alt 236	Note 6	Yellow	Light Red	High Intensity
ED	237	φ	Alt 237	Note 6	Yellow	Light Magenta	High Intensity
EE	238	ε	Alt 238	Note 6	Yellow	Yellow	High Intensity
EF	239	∩	Alt 239	Note 6	Yellow	White	High Intensity
F0	240	≡	Alt 240	Note 6	White	Black	Reverse Video
F1	241	±	Alt 241	Note 6	White	Blue	Underline
F2	242	≥	Alt 242	Note 6	White	Green	Normal
F3	243	≤	Alt 243	Note 6	White	Cyan	Normal
F4	244	⌠	Alt 244	Note 6	White	Red	Normal
F5	245	⌡	Alt 245	Note 6	White	Magenta	Normal
F6	246	÷	Alt 246	Note 6	White	Brown	Normal
F7	247	≈	Alt 247	Note 6	White	Light Grey	Normal
F8	248	°	Alt 248	Note 6	White	Dark Grey	Reverse Video
F9	249	∙	Alt 249	Note 6	White	Light Blue	High Intensity Underline
FA	250	·	Alt 250	Note 6	White	Light Green	High Intensity
FB	251	√	Alt 251	Note 6	White	Light Cyan	High Intensity
FC	252	ⁿ	Alt 252	Note 6	White	Light Red	High Intensity
FD	253	2	Alt 253	Note 6	White	Light Magenta	High Intensity
FE	254	■	Alt 254	Note 6	White	Yellow	High Intensity
FF	255	BLANK	Alt 255	Note 6	White	White	High Intensity

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The name of the manual and the page _____
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Your city, state and ZIP _____
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