READ ME FIRST

KAYPRO®

USER'S GUIDE

THE KAYPRO USER'S GUIDE

November 1984 2-2X-4-R Part Number 1463-M

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 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 or 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, 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.

INTERNAL MODEM

The Kaypro 300-baud internal modem (model 810184M) has been found to comply with part 68, FCC rules and has been certified by the Federal Communications Commission.

Registration number — CUL7XL-70818-DM-E
Ringer equivalence — 1.3A
USOC jack number — RJ11C

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
Keyboard to KAYPRO	81-285	Supplied with KAYPRO
KAYPRO Internal Modem to Phone System	81-419	Option
KAYPRO Serial Port to Serial Peripheral (Printer, Plotter, Modem . . .)	81-425	Option
KAYPRO Parallel Port to Printer	81-426	Option

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

CONTENTS

MEET THE KAYPRO!

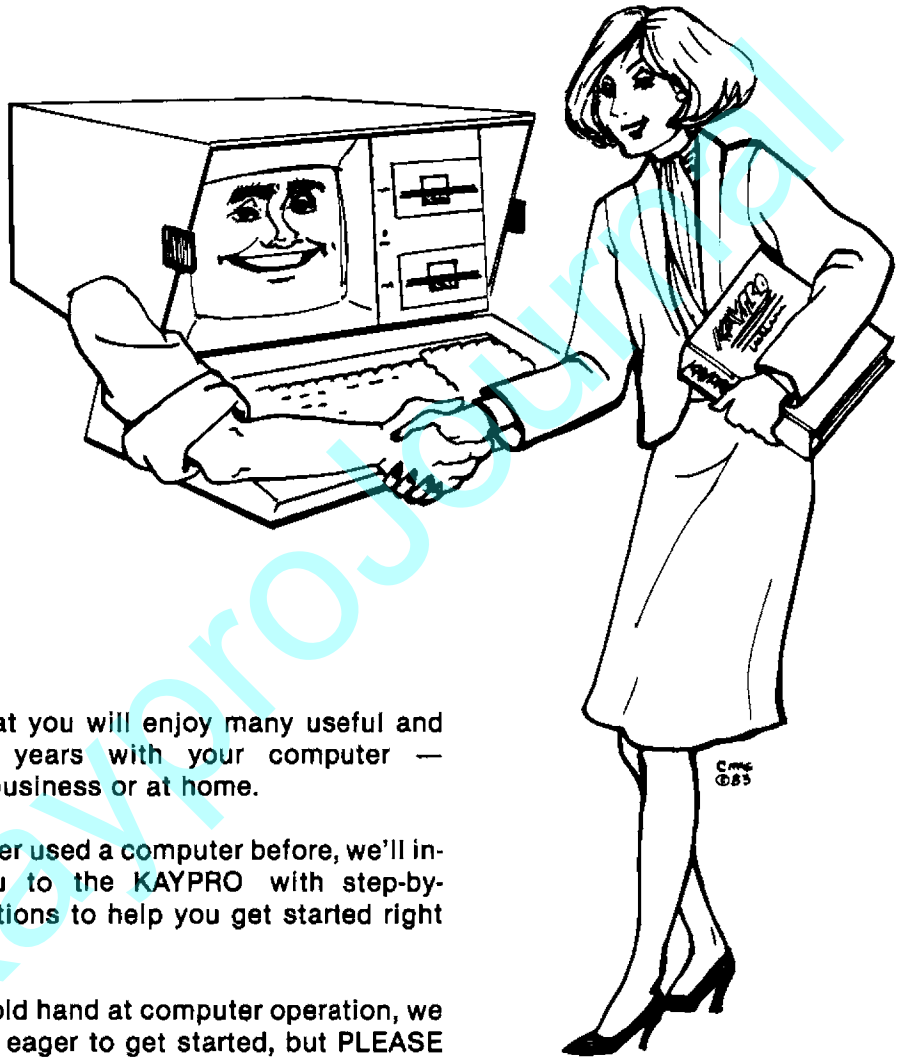
STARTING THE COMPUTER

BECOMING ACQUAINTED WITH YOUR COMPUTER

USING UTILITY FILES

TECHNICAL INFORMATION

MEET THE KAYPRO!



We hope that you will enjoy many useful and pleasurable years with your computer — whether at business or at home.

If you've never used a computer before, we'll introduce you to the KAYPRO with step-by-step instructions to help you get started right away.

If you're an old hand at computer operation, we know you're eager to get started, but PLEASE take a few minutes to read the instructions for getting started with your KAYPRO . It will save time and prevent problems.

Many of the terms used in this manual are explained in the glossary at the back.

WHAT YOU WILL NEED

BLANK DISKETTES

You will need enough blank diskettes to copy your master diskettes and as many other diskettes as you need to store information such as: text files, mailing lists, and programs which you write. Do buy good-quality diskettes.

The KAYPRO 2 uses 5¼-inch **single-sided**, double-density, soft-sector diskettes which store 195K bytes. As 4K bytes are reserved for the operating system and other essentials, 191K bytes are available for the storage of approximately 6Ø typewritten pages of text. The KAYPRO 2X uses 5¼-inch **double-sided** , double-density, soft-sector diskettes which store 39ØK bytes. As 4K bytes are reserved for the operating system and other essentials, 386K bytes are available for the storage of approximately 12Ø typewritten pages of text.

The KAYPRO 4 uses 5¼-inch **double-sided** , double-density, soft-sector diskettes. These have the same features as the diskettes for the 2X.

The KAYPRO 4X and ROBIE use 5¼-inch high-density diskettes you will be using are pre-formatted in a 17-sector, 319-track, 192 tpi format. These diskettes hold 2.5 megabytes of information or approximately 77Ø typewritten pages.

Your dealer will have these diskettes. Buy only high quality diskettes.

DISKETTE COMPATIBILITY

Throughout the the Kaypro line of microcomputers there are some differences in the type of diskettes used by individual computers. Remember that, just because the computer can read a different type of diskette than it normally uses, we do not recommend using that type of diskette for any extended period of time. It will slow down disk operations and can accelerate wear on the drive mechanism. In order to reduce the confusion about which computer can read which diskettes, the following chart should be of some help:

Drive type	Usual Diskette	Other Diskettes
Double-sided	Double-sided Double-density	Can read and write to single-sided diskettes.
Single-sided	Single-sided Double-density	None.
High-density	Double-sided High-density	Can read from standard diskettes.

WORK SURFACE

You will want a work surface 20" × 20" with leg room underneath. It should be near a grounded electrical outlet.

POWER REQUIREMENTS

Kaypro computers can use normal house current. The outlet should be grounded. If you want to take your computer overseas, your dealer can switch the power supply.

For power requirements for peripherals, such as a printer, consult the owner's manual for the peripheral.

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

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 most spikes and variations in the power line that can upset the operation of your computer.

SETTING UP THE KAYPRO

1. Set the KAYPRO on the work surface where you want the keyboard to be, because the keyboard is on the bottom. While it is in this position, look at the rear panel to locate the controls, switches, and ports.

2. Then, turn the KAYPRO so the ventilated side faces away from your work position.

3. Unwind the AC line power cord, but DO NOT PLUG IT IN YET.

4. Push down the tops of the latches on both sides of the KAYPRO; then pull out the bottoms of the latches to detach them from the keyboard.

5 . Carefully lift the computer off the keyboard, and lay it on the working surface with the large, ventilated surface down.

6. Place the keyboard where you can use it comfortably.

7. Raise the front of the computer, reach underneath, and pull down the folding metal stand.

8. Plug one end of the coiled cable into the keyboard jack on the back panel of the computer. The protrusion on the plastic connector should be up.

9. Plug the other end of the cable into the jack on the back of the keyboard. The protrusion on the plastic connector should be down.

1Ø. Route the coiled cable under the computer.

11. There are cardboard protectors in the diskette drives. Remove and save them. A handy place to keep the protectors is tucked under the handle on the back of the computer. If you close the computer to carry it, reinsert the cardboard protectors. If you ever ship the KAYPRO, be sure to place the protectors in the diskette drives, or the drive warranty will be void.

12. Make sure the ON-OFF switch on the back of the computer is turned OFF (down).

13. Plug the power cord into an electrical outlet.

STARTING THE KAYPRO

1. Turn on the computer, using the power switch on the back panel. The power light and the drive A light will illuminate.

   INDICATOR LIGHTS ON THE KAYPRO

   POWER ON — The light beside the screen tells you that the power is ON.

   DISKETTE DRIVE INDICATOR LIGHTS — The lights next to the doors of each diskette drive tell you which drive is in use.

2. If, after a moment, there is nothing on the screen, use the brightness control knob on the back panel to adjust the brightness.

TURNING OFF THE KAYPRO

1. If you have been using a program, close the file by entering the command appropriate to the program.

2. When you see the prompt, A >, remove the diskettes.

   Note: ALWAYS remove diskettes before turning off the computer.

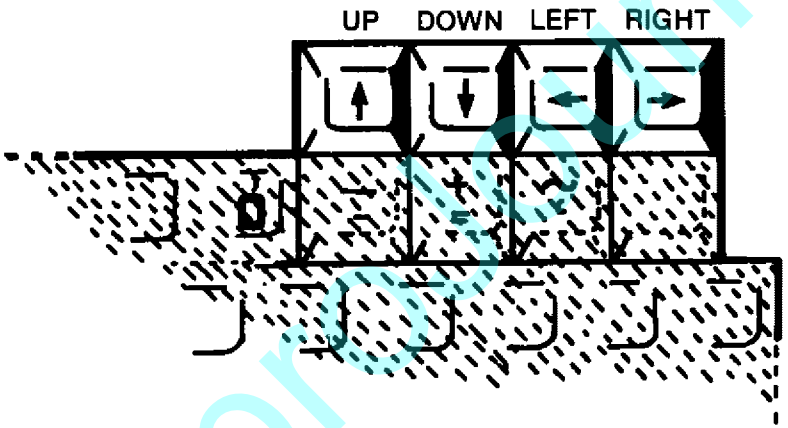
3. Turn off the computer, using the power switch on the back of the computer.

BECOMING ACQUAINTED WITH YOUR COMPUTER

THE CURSOR AND CURSOR KEYS

The cursor, a flashing rectangle, is a place marker to show where the next character you type will appear.

In certain programs. you can use the cursor keys (arrow keys) to move the cursor freely around the screen:



To see the cursor movement, type any letters, or use the space bar at the bottom of the keyboard.

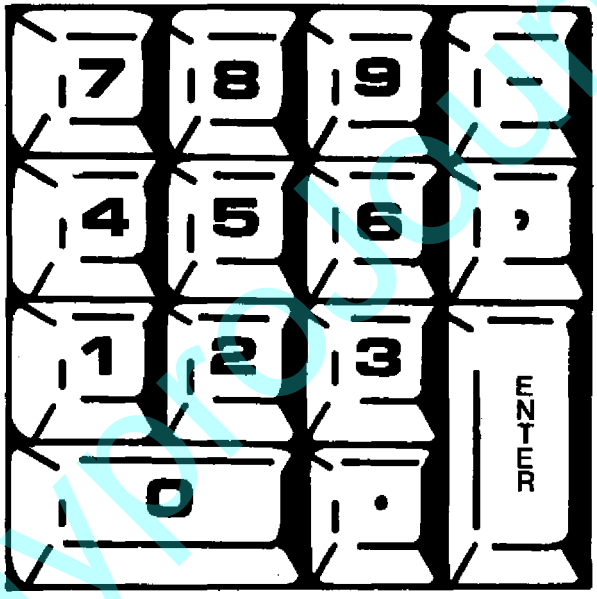
You can change the operation of the arrow keys so that they will enter any character or string of up to four characters. When you are ready to do this, look in the index under "arrow keys, reconfiguring."

Software controls the arrow keys; therefore, different programs may give different results when the arrow keys are used. When A > is on the screen, the cursor keys enter control characters which have no meaning.

THE NUMERIC KEYPAD

To the right of the main keyboard are 14 keys in a numeric calculator-style layout.

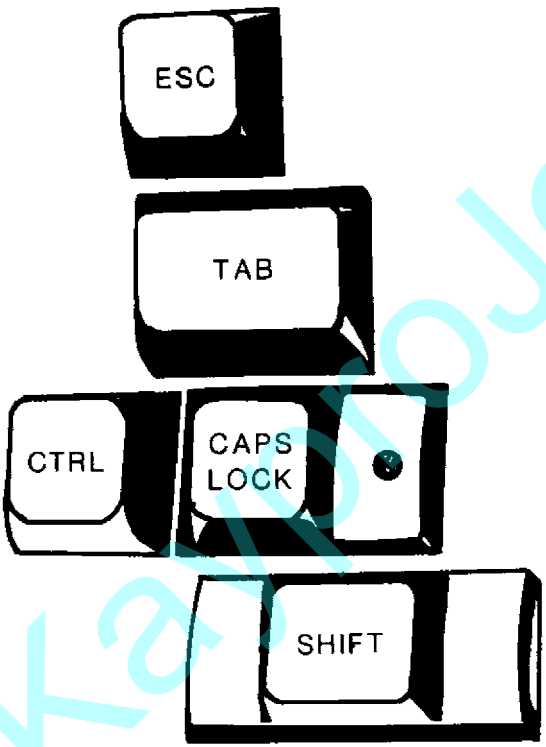
With the exception of a few control keys, such as CTRL, ESC, and RETURN, the keys, including the cursor movement keys, will automatically repeat when held down. Try this now.



You can change the operation of the keypad keys so that they will enter any character or string of up to four characters. When you are ready to do this, look in the index under "keypad, reconfiguring."

KEYS ON THE LEFT OF THE KEYBOARD

If the A > is on the screen, you can try all these keys except ESC.



The ESCape key can have various uses depending on the software. Use it according to program instructions.

The TAB key moves the cursor horizontally a set number of spaces, according to the program.

The CONTROL key is used simultaneously with letter keys to do certain functions. Depress the CTRL key; then, while it is depressed, type the letter. Sometimes the control function will display as a ^ character followed by a second character.

The CAPS LOCK key puts alphabetic characters in upper case. Press once to activate it (the red light on the key goes on), and press again to deactivate it.

The SHIFT key is used simultaneously with letter keys to put alphabetic characters in upper case. It also accesses the characters on the upper part of keys, for example, @ and ?.

KEYS ON THE RIGHT OF THE KEYBOARD

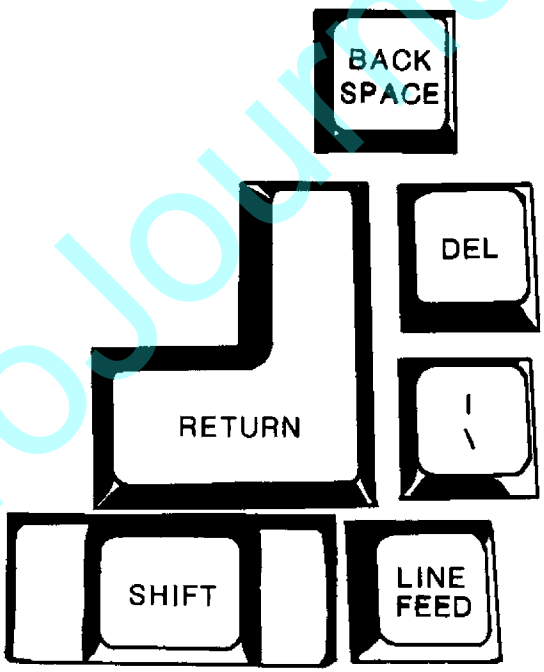
If the A > is on the screen, you can try all these keys.

The BACKSPACE key moves the cursor backward, sometimes deleting the character over which it moves, depending on the program being used.

The DELete key deletes the previous character. If you use the key to correct command lines, it will echo the deleted character.

The RETURN key moves the cursor down a line and returns the cursor to the left of the screen. It also tells the computer to execute the latest command and has various other uses. <RET> and <CR> are computer symbols to indicate that you should press the RETURN key.

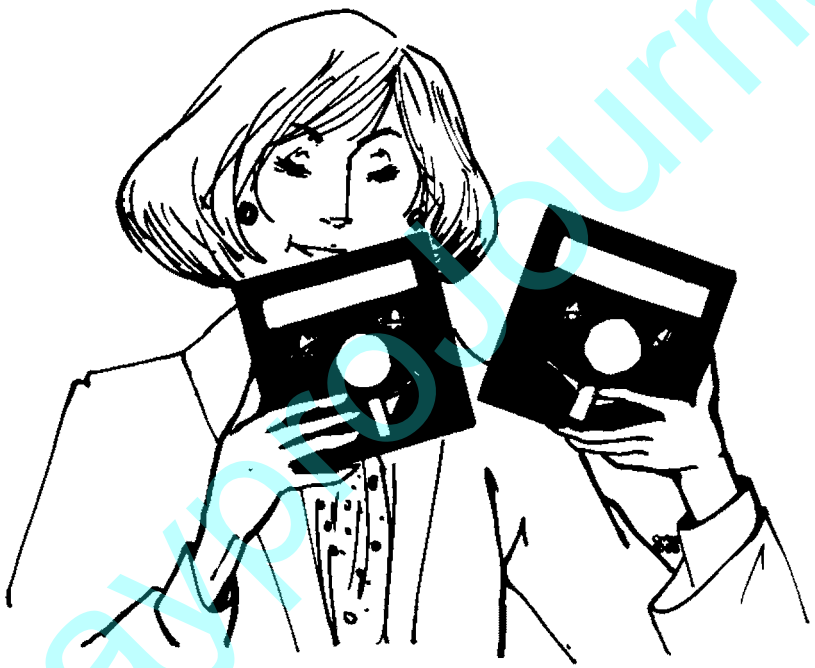
The LINE FEED key moves the cursor down one line with no return to the left.



The backslash/vertical \ | key will give a backslash when pressed without using the shift key. When the shift key is used, you will get a broken vertical line on the screen. However, on the printer, various characters may appear. If you have use for printing the vertical line, get your dealer to check into coordinating the | with your printer.

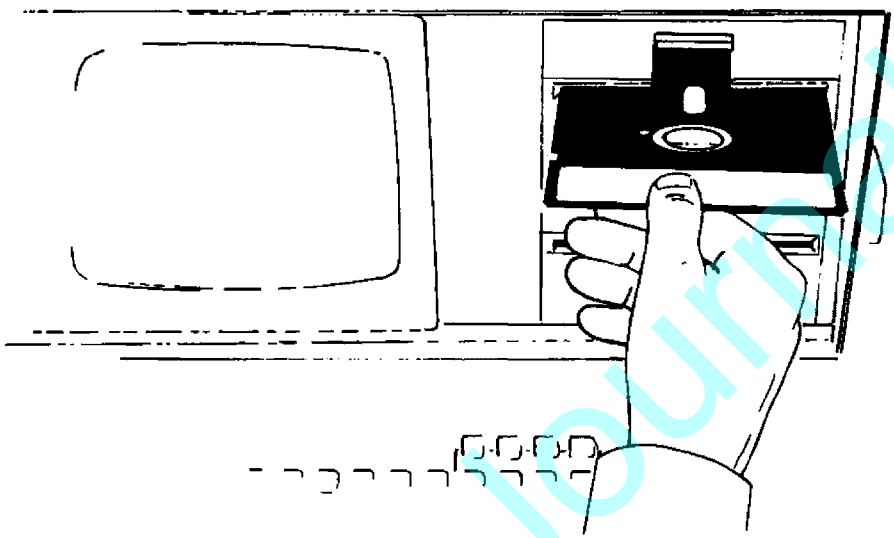
HANDLING OF DISKETTES AND OTHER TIPS

Diskettes store data on a magnetic surface that is vulnerable to damage which could result in the loss of data. Here are a few simple guidelines for handling and using diskettes.



HANDLE DISKETTES WITH CARE: Do not flex or bend diskettes. Do not touch the exposed (brown) portion of the diskettes, because chemicals or oils on the fingers can damage the magnetic surface of the diskettes.

STORE DISKETTES SAFELY: Store diskettes in a container or file in a clean, dry, cool place away from magnetic fields, away from the computer, away from telephone lines, etc. Extreme heat or cold or moisture can damage diskettes.

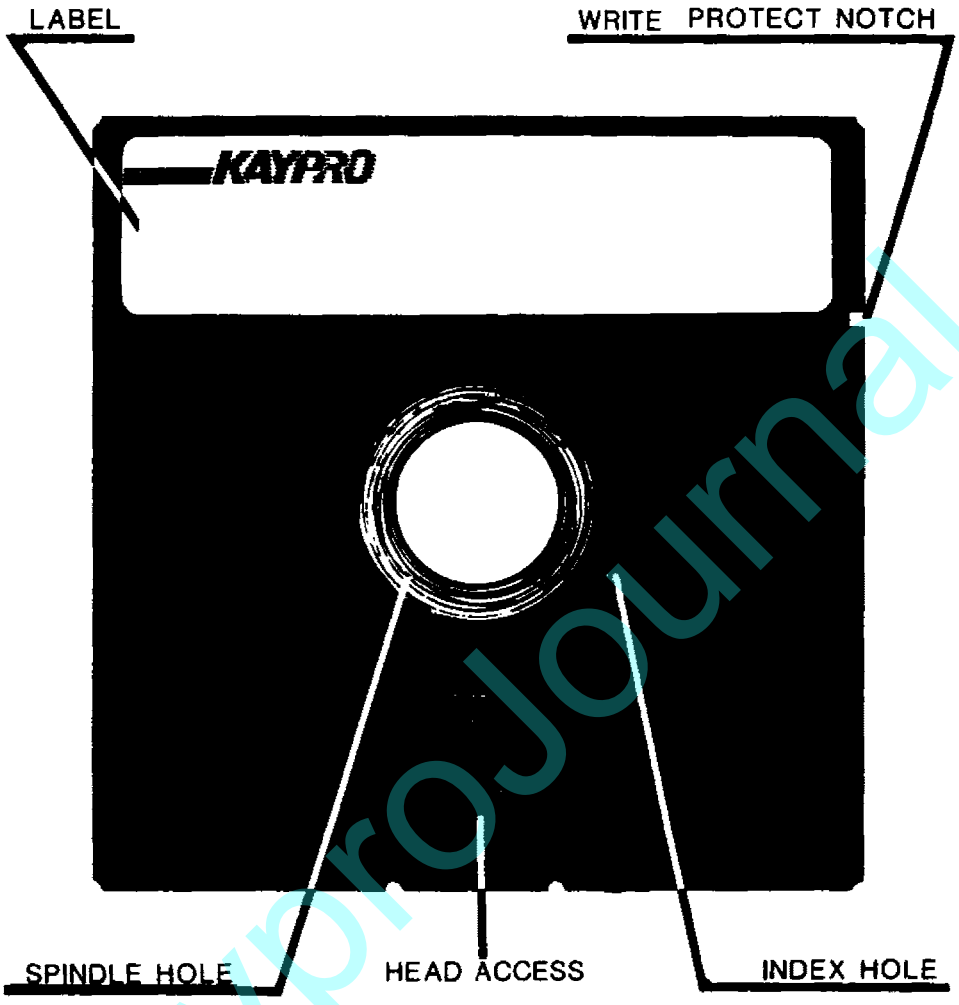


ELECTRICAL POWER: Always remove diskettes from the drives before turning OFF the computer or turning ON the computer.

INSERT DISKETTES CAREFULLY: Open the drive door and insert the diskette with the write-protect notch toward the left of the drive. On some drives you will feel slight resistance but no force is necessary. Close or latch the drive door to activate the drive.

TO REMOVE A DISKETTE: Open the drive door or latch. Some drives will partially eject the diskette, others will not. Remove the diskette from the drive.

CLEAR THE COMPUTER AFTER CHANGING DISKETTES: When a diskette is inserted into a drive and the door is closed, information concerning the operation of that diskette is loaded into the computer and remains there until the computer is cleared. If you remove the diskette and insert another without clearing the computer, the information regarding the newly-inserted diskette can cause problems. So, after changing diskettes, ALWAYS clear the computer by holding down the CTRL key and pressing the C key. If a program prompts you to change diskettes, you do not need to clear the computer unless you are prompted to do so.



WRITE-PROTECT NOTCH: Leave the write-protect notch uncovered if information is to be written on, or erased from, the diskette. Cover the notch to prevent any additions or deletions of information on the diskette. The master diskettes that come with the KAYPRO have no notches; therefore, they cannot be written on or erased.

LABEL DISKETTES CAREFULLY: Immediately label all diskettes to identify the files which they contain. Use "press-apply" labels. Write the label; then apply it to your diskette. If you must write on a label which is on a diskette, use a soft, felt-tip pen, as a ballpoint pen can damage a diskette.

STORE INFORMATION FREQUENTLY: Store data frequently — as you create it — about two to four times an hour — in case there is an unexpected power outage, and store your work whenever you leave the computer, even briefly. Be sure to save information you have entered into the computer before turning it off. The procedure for storing information depends on the program being used. Do not place diskettes on top of the computer.

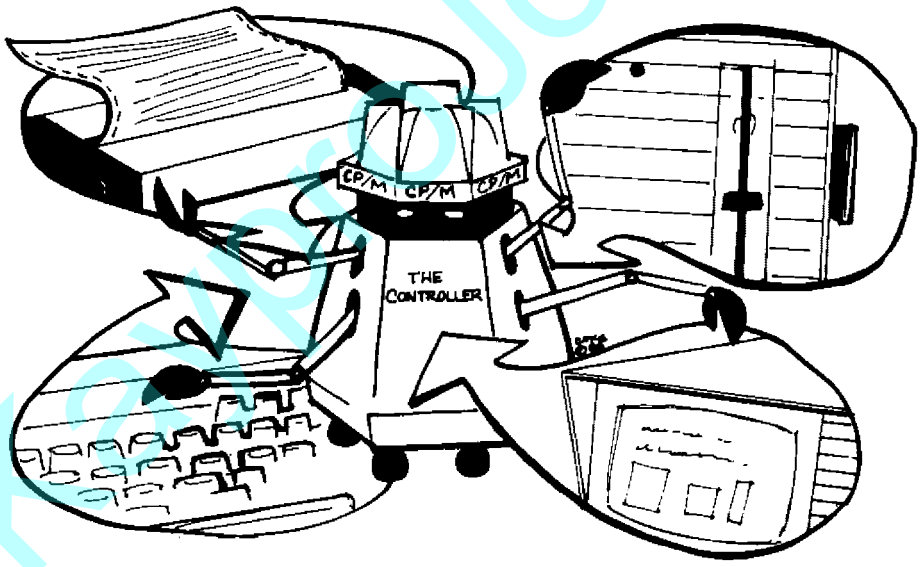
CP/M — THE PROGRAM WHICH OPERATES THE KAYPRO

Your KAYPRO computer uses the CP/M (Control Program for Microprocessors) operating system. Most CP/M functions operate without your being aware of them, but a few utility files can be used under your control. Three important "automatic" components of CP/M are:

BDOS, the Basic Disk Operating system, which handles user areas and files on diskettes;

BIOS, the Basic Input/Output Sytem, which communicates with printers and other peripheral devices; and

CCP, the Console Command Program, which communicates between you, the user at the keyboard, and the internal processing of the computer.



FORMATTING DISKETTES

A new diskette must be magnetically formatted to prepare it to receive information which you input. A diskette that is formatted double-sided has 8Ø circular tracks with each track having 1Ø sectors. A diskette that is formatted single-sided has 4Ø tracks with each track having 1Ø sectors. Format diskettes as soon as you buy them so they will be ready when you need them.

CAUTION: Formatting a diskette **erases all** old information.

To format a diskette:

1. Turn on or reset the computer.

2. Insert the CP/M diskette into drive A with the label facing up.

3. Insert a new diskette into drive B.

4. Type: COPY
   Press RETURN.

5. When the main menu appears, choose the BLANK option by typing: B

6. Read the message on the screen.

7. Press RETURN.

   You will see the formatting track numbers ØØ through 79 for double-sided diskettes or ØØ through 39 for single-sided diskettes. Then CP/M will be written to the disk, and the main menu will appear again.

8. To exit, type: E

   The diskette in drive B is now ready to store information.

COPYING DISKETTES

CAUTION: When you use the COPY program, anything already on the diskette in drive B will be lost forever.

To copy a diskette:

1. Insert the working copy of your CP/M diskette in drive A.
2. Clear the computer by holding down the CTRL key and typing: C
3. To run the COPY program, type: COPY
   Press the RETURN key.

   A menu of choices will appear.
4. Choose the COPY option by typing: C
5. Read the message on the screen.
6. Remove the CP/M diskette from drive A (unless you are copying the CP/M diskette itself).
7. Insert the diskette you are copying into drive A.
8. Insert an empty diskette into drive B.
9. To start the copying process, press the RETURN key.

   The track numbers will display as they are being copied (ØØ through 39 for single-sided diskettes and ØØ through 79 for double-sided diskettes.)

   When the last track has been copied, a list of programs will appear.
10. Read the information on the screen, and follow the instructions.
11. Remove the diskette from drive A.

12. Remove the new working copy from drive B.

13. If you have just copied a master diskette, label the working copy with the appropriate sticker provided with the computer. If you are copying a diskette other than a master diskette, make a label.

14. To make working copies of all your master diskettes, repeat the procedure from step 7 until you have made working copies of all the master diskettes.

15. Store the master diskettes in a safe place in case you have to copy them again.

USER AREAS

NOTE: User areas are practical mainly on the computers with larger storage, such as Robie, KAYPRO 10, etc.

Each diskette that you will be using is divided into sixteen different user areas. These sixteen areas are numbered from 0 to 15, with the number of the current area being indicated by the CP/M prompt; for instance, A0>, B3>, A12>. Inside each of these user areas you can set up files to hold information in much the same way a filing cabinet holds material in file folders. This feature is extremely helpful because it enables the grouping of files and easy access to those groupings.

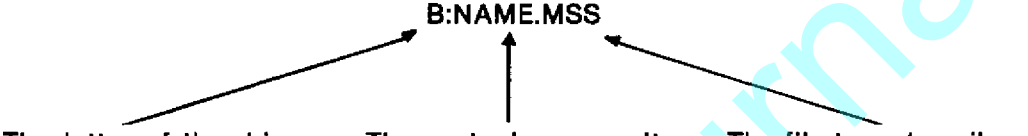
To receive a listing of the files that are in certain user areas, all you need to do is call up a directory, which will give the name, extension, and size of all the files. The use of the directory is covered in the section Finding Files. Also, because there is no specified amount of space in a user area, each area takes from the full storage capacity as it needs it. Therefore, user area 0 could, if desired, take up all the available space on a diskette.

All user areas are isolated from other user areas, with the exception of user 0. User 0 is a public area to all other user areas on that drive. So, if you are in user 12, and want to run a program which is in user 0, just type the name of the program after the A12> prompt. User areas are further explained in the CP/M OPERATING SYSTEM MANUAL which is a separate book included with the KAYPRO.

NAMING FILES

Information is stored in the form of **files**. The number of files that can be stored depends on how much information is in each file.

Files must be named according to established practices, and the file names MUST BE TYPED CORRECTLY.



The letter of the drive which contains the file. It must be followed by a colon (:). A semi-colon (;) will not do.

The actual name. It describes the contents of the file, is no longer than eight characters, and must start with an alphabetical character.

The file type describes the kind of file, such as .LTR for letter. It is preceded by a period and is no more than three characters long.

There are some characters that you must NOT use in a file name:

< > ( ) \ ; : = ? * [ ] . , _ % :

We recommend that you use only the letters A to Z and the numbers Ø to 9 with the first character being a letter. Any other combination can cause problems in some software.

When CREATING a file, use upper-case letters. The operating system converts lower-case input to upper case, BUT SOME PROGRAMS DO NOT. This can result in a file that can be accessed only by the program that created it. You would not even be able to erase a lower-case file from the operating system.

When ACCESSING a file not on the currently-logged drive, include the drive letter and a colon (:) as part of the file name. 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 type, if there is one.

FINDING FILES

To list all files in the current user area on drive A, at the A > prompt, type: d
Press RETURN.

To list all files in the current user area on drive B, at the A > prompt, type: d b:
Press RETURN.

The contents of the current user area will be listed under the headings:

Name — the files will be listed alphabetically.

Ext — refers to the file type.

Bytes — gives the size of the files.

To list files in all the user areas on drive A, at the A > prompt, type: d $uvs
Press RETURN.

The $uvs is a combination of switches which also can be used individually.

$u — shows files in all user areas

$v — expands the directory to show user area number (UN) and file attributes (At)

$s — shows "system" files not normally shown in the listing

To find the user area of a certain file, substitute the name of the file for filename and type the following:

D filename $uvs

or

d b:filename $uvs

GETTING STATISTICS ABOUT FILES

The STAT command provides STATistics about the space used and the space available on a disk. The prompt, A > or B >, indicates the currently-logged diskette drive. This is the diskette drive on which the computer automatically looks for files if the drive name (A: or B:) isn't specified.

If the currently-logged drive (the one with the light on) is A, then the command:

STAT	will show how much space is available for use on the diskette in drive A.
STAT B:	will show how much space is available for use on the diskette in drive B.
STAT *.*	will show how much space is used by each file on the diskette in drive A, as well as how much space is left.
STAT B:*.*	will show how much space is used by each file on the diskette in drive B, as well as how much space is left.
STAT USR:	will show the user area numbers that have files on the currently-logged disk. This is pertinent only if you have put files in specific user areas.

You can change the currently-logged diskette drive to drive B. After the A > prompt, type: B:
Press RETURN, and you will see the prompt: B >

To get back to drive A, type: A:
Press RETURN.

COPYING FILES

You'll copy files many times while using your KAYPRO. There are two ways to do this; by executing either the COPY program or using PIP. The COPY program is used when you want to copy an entire diskette quickly and easily without going through the process of transferring files one by one or in groups using PIP. However, when copying anything less than an entire diskette, you will have to use PIP, one of the standard CP/M utilities.

USING PIP

PIP is an acronym for Peripheral Interchange Program. With PIP you can copy disk files from one peripheral device to another. The disk drives and the screen are peripherals as well as a printer or any other device you may have connected to your system. You can PIP files to other disks, the screen, your printer, other user areas, and to the same disk under a different name.

The form of the PIP command:

PIP <destination> = <source>[options]

The <destination> and <source> are usually of the form:

B:KAYPRO.LRN
| | |
| | The file type. The last three letters must be included on the source specification, if the source has one. It is optional on the destination file specification.
| |
| The filename, for destination, doesn't have to be the same as the source file. This is one way to rename a file as part of the copying process. If you aren't changing the file name, you can specify the destination drive only.
|
The drive name. The colon is part of the drive name and must be included.

Another way to use PIP is to type PIP; then press RETURN. You will see an asterisk on the screen. The asterisk is PIP's prompt telling you that it's waiting for commands. Now you can enter any valid PIP command and press RETURN. PIP then executes the command and returns to the asterisk. When you're done transferring files, pressing RETURN at the asterisk prompt returns you to the operating system.

The <destination> can be something other than a disk file if you wish. Valid destinations, other than disk files, can be:

CON: — Stands for CONsole and is used when PIPing a file to the screen.

PRN: — The system printer. PIP recognizes two device names as meaning your printer, PRN: and LST:. When a text file is PIPed to the PRN: device, each line is numbered and a form feed is generated every 60 lines. This option is for ASCII text files only.

LST: — This is the second designation for your system printer. This device does not number the lines. Neither does it expand tab characters nor generate form feeds, unless the T and P options are specified.

Options to PIP must be enclosed in square brackets at the end of the command line. PIP has a whole series of options, but we will only be discussing the most frequently used ones here. They are:

O — For Object files. Programs such as WS.COM, D.COM, or overlay files like WSMSGS.OVR are object files. If you get strange garbage when you try to read the file on your screen, use the O option when PIPing that file.

V — For verify. It's a good idea to use this option on every PIP operation. When the copy is finished PIP will compare the two files to be certain that nothing was scrambled during the transfer. If they don't match PIP issues an error message and aborts.

G — Get from. The G option allows you to get the source file from some other user area. Follow it with the number of the user area which has the file to be copied.

T — Expand tabs. This option must be immediately followed, no spaces, with a decimal number stating how many spaces each tab is to be expanded.

P — Page eject (form feeds). This option must be immediately followed, no spaces, by a decimal number stating how many lines you wish on each page. An initial form feed is sent to the printer prior to sending to first page of the file.

Z — Sets the high bit in each byte to Ø. Use this option when PIPing WordStar document files to the screen or a printer; otherwise the printout will be difficult to read.

Examples:

PIPing a program, D.COM, from drive B to drive A without changing its name. Since this is a program (an object file), the O option is specified.

PIP A:=B:D.COM[OV]

The same operation but changing the name of the file to XDIR in the process:

PIP A:XDIR.COM=B:D.COM[OV]

Sending a text file to the screen:

PIP CON:=B:LTR.DOC[Z]

(NOTE: WordStar arranges its document files in a way that interferes with the display of that file when not sent through WordStar. This can be allowed for by specifying the Z option).

Printing a file on your printer:

PIP PRN:=A:DUMP.ASM (NOTE: This command will number each line and issue a form feed every 60 lines).

or

PIP LST:=A:DUMP.ASM[T8P55] (NOTE: This version of the command expands all tabs 8 spaces and sends an initial form feed with another form feed every 55 lines).

Moving a copy of a file from user area 9 to the current user area:

PIP A:=A:THISFILE.TXT[G9V]

It is also possible to create a text file using PIP. To create a text file called MYFILE.DOC, you would enter the following command when the A prompt is on the screen:

```
PIP A:MYFILE.DOC = CON:
```

Then type in whatever you wanted the file to contain. Mark the end of the file by entering CTRL-Z.

PIP can also be used to copy groups of files or even entire diskettes. This can be done using *.* (named "wild card"). To copy all the files that have the same extension (for example .EXT) from drive A to drive B:

```
PIP B: = A:*.EXT[OV]
```

To copy an entire diskette from drive A to drive B:

```
PIP B: = A:*.*[OV]
```

The CP/M manual from Digital Research details other options to PIP. Many books have been written about CP/M and are available at computer and book stores.

ERASING FILES

To erase a file:

1. Go to the user area containing the file.

2. Type: ERA

3. Add the file name with its file type.
   Press RETURN.

   Example: ERA VEHICLE.EXP

The ERAse command also responds to CP/M wild card characters, * and ?, which enables you to erase groups of files at a time. BE CAREFUL when using wild cards with the ERAse command. It is easy to erase files that you'd really rather have kept. See the CP/M OPERATING SYSTEM MANUAL for further information on the use of * and ?.

RENAMING FILES

To RENname a file on a diskette in drive A, after the A > prompt;

To change file:	Type:
OLDNAME.DOC to NEWNAME.DOC	REN NEWNAME.DOC = OLDNAME.DOC

If the file to be renamed is on the diskette in drive B, then precede the file name with: B:

NOTE: The rename will not take place if NEWNAME.DOC already exists.

RECONFIGURING THE KEYPAD

If you have little use for entering numerical data with the numeric keypad, you may want to reconfigure the keypad. This will enable you to activate with one keystroke, functions which usually take up to four keystrokes. Here is the procedure:

1. Make a diagram of the keypad with the changes you want to make. This will help you in the reconfiguration, and, after the reconfiguration, will serve to remind you of the new functions you have given the keys.

2. Insert the CP/M diskette into drive A.
   Type: CONFIG
   Press RETURN.

3. Follow the instructions on the screen.

RECONFIGURING THE ARROW KEYS

The procedure for reconfiguring the arrow keys is the same, except, select **Redefine the vector pad** by typing: V

All copies made from a reconfigured diskette will have the same changes as on the original. When keys are reconfigured for a diskette and it is removed from the drive, those changes apply to any diskette which is placed in the drive until a CTRL-C is entered or the computer is reset.

SETTING THE REAL-TIME CLOCK

If your model of KAYPRO has a real-time clock, set it as follows:

1. Place the working copy of the M-BASIC diskette into drive A.

2. Type: MBASIC CLOCK
   Press RETURN.

3. When you see a prompt asking if you want to reset the clock, type: Y

4. Following the prompts, type in the information, using numbers, not words. Press RETURN after each entry.

   When the entries have been made, the screen will clear, and there will be a clock display.

5. To exit the program, press ESCape.

6. When you see a prompt asking if you want to reset the clock, type: N

7. After ok, type: system
   Press RETURN.

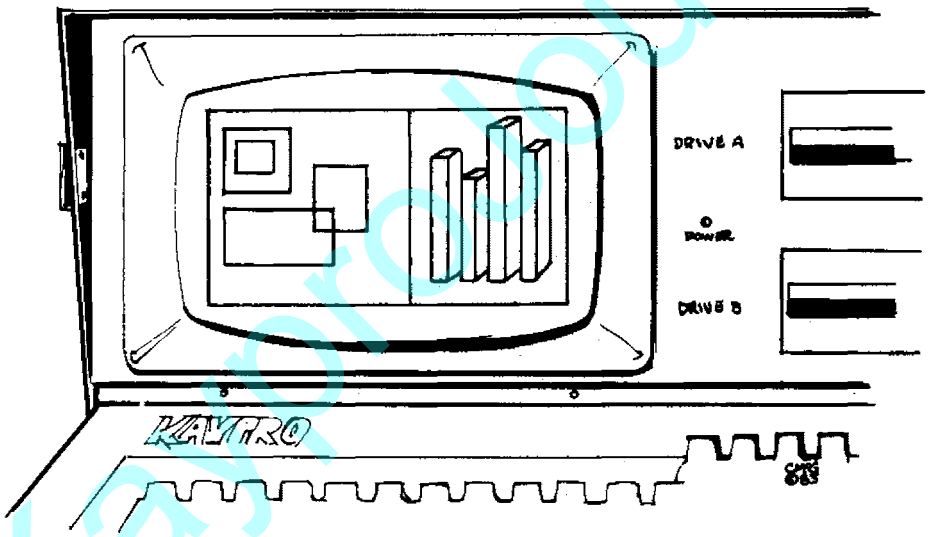
PROGRAM TO TURN OFF THE KEYBOARD CLICK

This program is in the M-BASIC programming language. See your M-BASIC manual for details.

```
10  REM THIS PROGRAM TURNS OFF THE KEYBOARD CLICK .
20  DEFINT A-Z ' SETS ALL NUMERIC VARIABLES AS INTEGERS
30  KEYBOARD = 5
40  QUIET = 8
50  OUT KEYBOARD, QUIET
60  END.
```

USING GRAPHICS ON THE KAYPRO

Even those Kaypros which have graphics capability need a program to tell the computer what to do. If you are able to write these programs, then the information you need is on the following pages. If you are not able to write the programs and want to use the graphics capability for business or other purposes, then it is best to find someone to write a program to do what you want.



DRAWING GRAPHICS WITH THE VIDEO GRAPHICS AND ATTRIBUTES COMMAND SET

The graphics and attributes set on those Kaypros which have graphics capability include drawing and erasing lines, drawing and erasing pixels, inverse video, reduced intensity, blinking fields, graphics characters, cursor positioning, and cursor on/off.

To draw graphics, the screen is treated as an array 1ØØ pixels high, and 16Ø pixels wide. Any spot on the screen can be addressed by a vertical coordinate (ranging from 32 to 131) and a horizontal coordinate (ranging from 32 to 191). The pixel in the upper left corner of the screen has coordinates of 32,32. It would seem natural to start the numbering of coordinates at 1 or Ø. However, some byte values of 32 or less are interpreted by BDOS as control keys.

Line and pixel graphics are drawn on the screen by writing an escape sequence to the console output. For the purpose of drawing lines and pixels, an escape sequence is a 4- or 6-byte sequence defined as follows:

Escape sequence =

ESC <sequence-type> <V1> <H1> [<V2> <H2>]

where:

1) ESC is an ASCII 27 (1B hex).
2) <sequence-type> is a character of the set:

*	to write a pixel
(space)	to erase a pixel
L	to draw a line
D	to delete a line

3) V1, H1, V2, H2 are 1-byte values indicating locations on the screen.

To write a pixel:

The sequence-type must be a "*"
H2 and V2 are not used
V1 is the vertical coordinate of the pixel.
H1 is the horizontal coordinate.

To erase a pixel:

The sequence-type must be a space.
H1, V1, H2, and V2 are the same as above.

To draw a line:

The sequence-type must be an "L".
H1 is the horizontal coordinate of the first point of the line.
V1 is the vertical coordinate of the first point.
H2 is the horizontal coordinate of the last point.
V2 is the vertical coordinate of the last point.

To delete a line:

The sequence-type must be a "D".
H1, V1, H2, and V2 are the same as above.

POSITIONING THE CURSOR

When positioning the cursor, the screen is treated as an array 25 characters high and 80 characters wide. Any character cell on the screen can be addressed by:

a vertical coordinate (ranging from 32 to 56)

a horizontal coordinate (ranging from 32 to 111).

The character in the upper left corner of the screen has coordinates of 32,32. Please note that this applies only to text and graphics characters that occupy a full character cell. Pixel graphics on the Kaypro line address a matrix of 100 by 160 with an initial offset of 32 for each coordinate. This makes an addressable matrix of 32 to 132 vertical and 32 to 192 horizontal.

The cursor can be moved to a desired position on the screen by writing an escape sequence to the console output. For the purpose of cursor positioning, an escape sequence is a 4-byte sequence defined as follows:

Escape sequence = ESC EQUAL SIGN <V1> < H1>

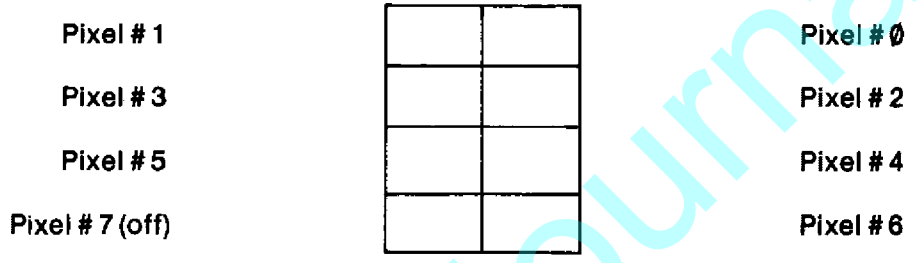
where:

1) ESC is an ASCII 27 (1B hex).
2) EQUAL SIGN is the character '=' (3D hex).
3) V1, H1 are 1-byte values indicating the location on the screen.

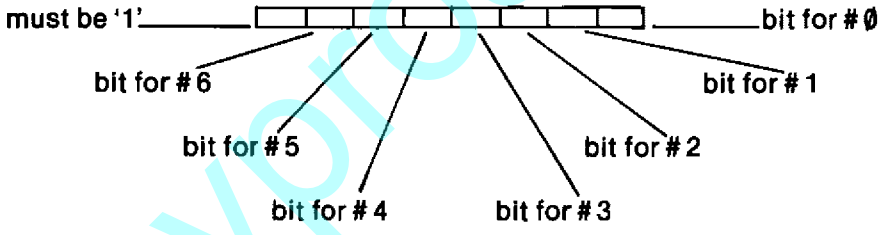
POSITIONING OF PIXELS

Each of the character positions on the screen occupies the same area as eight pixels (4 high, 2 wide). Thus, pixels can be addressed in groups of eight at a time. To set pixels in a character position, the cursor is moved to that position, and then a byte is sent to the console output. This byte must have the high-order bit set to 1 to distinguish it from normal characters. The remaining seven bits are used to set 7 of the 8 pixels.

i.e., to write these pixels....



output this byte:



As shown above, pixel # 7 is off. To write a pixel with it on, send the inverse video command (ESC,B,Ø), then output the inverse for bits Ø through 6, i. e., 1Ø000000b would print a blank graphics character; (ESC,B,Ø),1ØØØØØØØb would print a solid character.

Refer to the Graphics Character Set chart to see what hexadecimal output results in which graphics character.

VIDEO MODE

Video Mode, normally off, is enabled by the ESCape sequence ESC, B, 5. To return to normal mode output ESC, C, 5.

With video mode on, 2 bytes are required for each graphic character. The Least Significant Bit of byte 1 controls pixel #7. The other pixels in the character are controlled by byte # 2 in the normal manner.

EXAMPLE: (Assuming that Video Mode is already on.)

To print a solid cursor-sized block on the screen, use M-BASIC to output to the console the following string:

```
PRINT CHR$(129);CHR$(255)
```

CHARACTER ATTRIBUTES COMMANDS

Characters can be set to inverse video, blinking, reduced intensity, or underlined. Also, the cursor can be turned off. These attributes are activated by sending a 3-byte escape sequence to the console output:

Escape sequence = ESC <on-off-code> <attribute-code>

where:

1) ESC is an ASCII 27 (1B hex)
2) <on-off-code> is a:

   B to set an attribute ON, or
   C to set it OFF.

3) <attribute-code> has a value of Ø through 6, as follows:

   Ø = inverse video
   1 = reduced intensity
   2 = blinking
   3 = underline
   4 = cursor
   5 = video mode
   6 = current cursor position
   7 = status line preservation

Default for these attributes is:

inverse video = off
reduced intensity = off
blinking = off
underline = off
cursor = on
video mode = off
current position = off

The Remember Current Cursor Position command stores the current coordinates of the cursor in memory. When the Return To Current Position Sequence is sent to the console, the cursor is returned to whatever coordinates are stored in that position.

Comments:

1) Examples of line and pixel drawing can be found in GRAPHICS.BAS.

SUMMARY OF COMMANDS

Graphics commands:

Draw Pixel	ESC, *, V1, H1
Erase Pixel	ESC, , V1, H1
Draw line	ESC, L , V1, H1, V2, H2
Erase line	ESC, D, V1, H1, V2, H2

Attribute commands:

	To Turn ON:	To Turn OFF:
Inverse Video	ESC, B, Ø	ESC, C, Ø
Reduced Intensity	ESC, B, 1	ESC, C, 1
Blinking	ESC, B, 2	ESC, C, 2
Underlining	ESC, B, 3	ESC, C, 3
Cursor	ESC, B, 4	ESC, C, 4
Video mode	ESC, B, 5	ESC, C, 5

To remember current cursor position: ESC, B, 6

To return to remembered position: ESC, C, 6

THE MODEM PROGRAM

If your KAYPRO model is equipped with an internal modem, please refer to the MITE manual that came with your computer.

USING THE MULTI-FORMAT PROGRAM

As a rule, you cannot buy a program created for one computer and use it in another computer, even though the diskettes are the same size. The MFDISK program, on the CP/M diskette, is Kaypro Corporation's answer to this common problem. MFDISK enables you to assign one or both of your diskette drives to a format alien to the Kaypro line of computers. By using the MFDISK program, you can read a number of other disk formats.

The MFDISK program found on the KAYPRO 2, 2X, and 4 allow you to format diskettes in an alien format; however, as with the COPY program each version of MFDISK is specific to one model of computer. For example, the version of MFDISK found on the KAYPRO 2 will not work on any other model of Kaypro computer because of differences in design.

To run the program:

1. Type: MFDISK

2. Press RETURN.

You should see a Menu of Manufacturers. Notice that this menu gives you choices for OTHER manufacturers, because MFDISK supports formats from more manufacturers than can conveniently fit on one menu. If the disk format you are looking for isn't on the first menu, check the OTHER menus.

At the bottom of the screen is:

Do you want to S)elect a disk, I)nquire about a format, F)ormat a disk, or R)eturn to complete selection, and go to CP/M?

S)elect — allows you to choose an alien format either drive A, or drive B.

I)nquire — attempts to figure out what is the format of the other diskette. Handy if you don't know what computer the diskette came from.

F)ormat — formats a diskette in the chosen format, but does not assign that format to any drive.

R)eturn — exits the MFDISK program; assignment of the alien format becomes effective upon exiting to CP/M.

3. Enter your choice by pressing the first letter of the option you want.

If you press either S or F, a menu will appear. Use the arrow-keys to move to the desired position.

4. Press RETURN.

The menu will now display one or more of the formats you have chosen. Notice that the right-hand side of the menu distinguishes between double- and single-density as well as double- and single-sided formats.

5. Move the contrasting bar to the format of your choice (which will always be double-density).

6. Press RETURN.

If your version of MFDISK allows formatting of diskettes and you choose F, MFDISK will now ask if you are sure that you want to format the diskette in the chosen drive. BE CAREFUL! MFDISK will reformat the systems disk in drive A if you tell it to. Press Y if you want to go ahead with the formatting procedure.

If you have chosen S, you will return to the main menu and a message below the menu choices will inform you if the format you have chosen is indeed the format of the diskette in the target drive. At this point you can either try again, or press R to return to the operating system. Returning to the operating system makes the format assignment final.

Once MFDISK has been run, each time a warm boot occurs, the system will name the drive assignments. These drive assignments remain active until MFDISK alters the assignment or the computer is reset. A report of "No Disk Entered" indicates that the drive has not been assigned to an alien format.

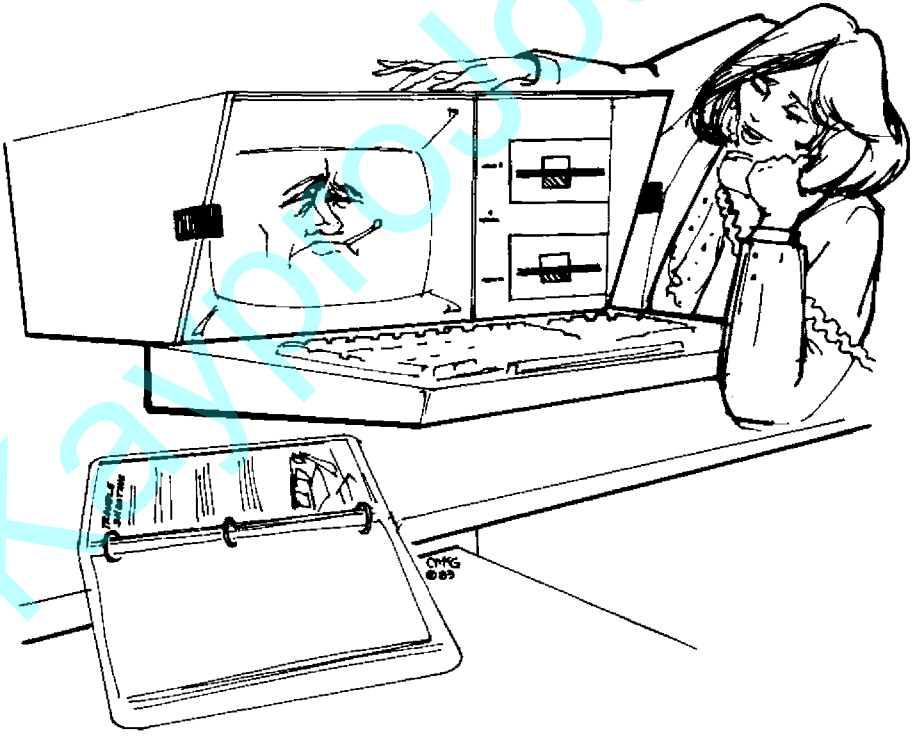
When you have finished using MFDISK, please open the door to the diskette drive and push the reset button on the rear panel. Otherwise there may be areas of memory conflict with some other programs.

TROUBLESHOOTING

If you have difficulties when operating the KAYPRO, 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 the KAYPRO.

Flip through the following pages to see what information is included. Much of it, after the first few pages, is for technicians and advanced users.



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 rear panel.

3. Drive door not closed properly.

4. Diskette in drive doesn't contain CP/M. Put the CP/M diskette into drive A and the diskette which isn't loading into drive B. Type: SYSGEN Press RETURN.

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

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

7. Diskette has been damaged; try making another copy from your master.

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. When all else fails, read your manual.

SYMPTOM: Computer unexpectedly ignores keyboard entries.

PROBABLE CAUSES AND REMEDIES:

1. Disconnect and reconnect the coiled cord which attaches the keyboard to the computer. This performs a RESET action on the keyboard.

2. 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 temporary "brownouts".

3. External peripheral devices or their connecting cables may be at fault. Try operation without peripheral or with different cable to isolate the problem.

4. Damaged or faulty diskette. Try to make a copy.

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

If keyboard entries are ignored after you have just set up the computer, make sure that the keyboard cord has not been plugged into the wrong jack.

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.

CLEANING THE FAN FILTER

Occasionally the filter on the back panel will need to be cleaned. DO **NOT** REMOVE THE SCREWS ON THE GRILL HOLDER. Simply grasp the center section with two fingers and pull until the grill pops out. Clean the filter by gently agitating it in water and mild soap or detergent. Let it dry, replace it, and replace the grill.

GLOSSARY

BIT	A binary digit, the smallest piece of information a computer can handle (see BYTE).
BOOT	This is loading CP/M into the computer's memory. A COLD BOOT occurs when you first turn on the machine or press the reset button; WARM BOOT occurs when you press the CTRL and C keys simultaneously (see CP/M manual for details). During a warm boot, anything in memory is lost; what you have saved on disk is not lost. A warm boot reloads a portion of the operating system (CCP and BDOS) because some programs overwrite that section of memory. It also remaps all disks and diskettes into memory. If the map in memory does not match the diskette, CP/M will not write any information to that diskette and will give a BDOS ERROR READ ONLY message.
BYTE	Eight BITS make one BYTE; the size of a memory location in the KAYPRO.
CCP	An acronym for Console Command Processor: the section of CP/M that makes sense of what you type on the keyboard.
CPM	An acronym for Control Program for Microprocessors. The operating system that runs the KAYPRO.
CPU	Central Processing Unit. The CPU is the microprocessor chip that controls the computer.
CRT	Cathode Ray Tube. The CRT is the tube that's used as the video display on the computer.
DIR	This is a built-in, CP/M command that lists names of all files on a diskette.
DISKETTE	Small flexible plastic disk, coated with magnetic material, used to store information.
FILE	Collection of data stored on a diskette.

FILENAME	The name of a file that you see when you list the directory or the name you use to access a file.
FORMAT	The organization of magnetic material on a disk that enables it to accept data.
HARDWARE	The physical components of the computer.
INPUT	The data that is entered into the computer. It can also be the process or means of putting data into the computer.
LOAD	To load information is to take it from a storage medium, such as a diskette, and put it into the computer's memory.
MODEM	An acronym MOdulation/DEModulation. A device that connects a computer terminal to another computer terminal via a communications link, such as the telephone system.
OPERATING SYSTEM	A program which controls the overall operation of the computer. CP/M is the operating system used by the computer.
OUTPUT	The output is the information displayed or used to control devices external to a computer. It can also be the process or means of getting information out of a computer.
PERIPHERAL	A device connected to and used with a computer, such as a disk drive, a printer, or a modem.
PIP	Peripheral Interchange Program. PIP copies disk files to other diskettes and other peripheral devices.
PROGRAM	A set of instructions that tells the computer how to perform a specific task.
PROMPT	A unique character or characters displayed by a program to inform the user that the program requires some instruction or information. In CP/M, the A > is a prompt which indicates that the computer is waiting for the user to enter a command.
RAM	Random Access Memory. RAM is the main working memory that the computer uses for short-term storage of information and programs. The information stored in RAM is volatile, and will disappear when the power to the computer is turned off. Ram memory can be written to and read from.

ROM	Read Only Memory. ROM memory is where instructions specific to a machine are stored. Information stored in ROM is not volatile, and will remain intact regardless of whether the power to the computer is on or off.
SOFTWARE	The programs which tell the computer what to do.
STAT	A CP/M program that gives the statistics about files on a diskette. It shows how much space (in kilobytes) each file is using and how much empty space is left.
USER AREA	The areas numbered Ø to 15 on a diskette that are set up to hold files.

INDEX

We welcome your comments on our manuals as an aid to making them better tools for the user. Please tell us:

The name of the manual _____ The page _____

Your comment _____

_____

_____

_____

_____

The name of the manual _____ The page _____

Your comment _____

_____

_____

_____

_____

Are you an experienced computer user? _____

If you would like an answer, tell us:

Your name _____

Your street address _____

Your city, state, and ZIP _____

If we want to discuss this with you, may we call you between 8:00 a.m. and 4:30 p.m. (Pacific time), Monday thru Friday? _____ Telephone number _____

Place
stamp
here

KAYPRO Corporation
P.O. Box N
Del Mar, CA 92Ø14

Attn: **Publications Department**