SOME OF THE INSTRUCTIONS INCLUDED IN THIS MANUAL PERTAIN TO OPTIONAL PROGRAMS WHICH ARE AVAILABLE THROUGH YOUR DEALER.

KAYPRO II

USER'S GUIDE

THE KAYPRO II USER'S GUIDE

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REDIRECTION Please first direct all queries and problems to your dealer.

Table of Contents

INTRODUCTION

Meet the KAYPRO II

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

Your KAYPRO II is capable of:

* writing and editing
* financial planning
* programming
* filing and record-keeping

and much, much more.

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

If you're an experienced computer operator, we know you're eager to get started, but PLEASE take a few minutes to read the instructions for installing and connecting your KAYPRO II and copying diskettes. It will save time and prevent problems.

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

SETTING UP YOUR KAYPRO

When unpacking your KAYPRO II, be sure to save the packing materials in case you want to ship it some day. Along with the packing materials and the KAYPRO II, the box should contain the following:

SOFTWARE PACKAGE

EDIT DISK (Perfect Writer)
LESSONS DISK (Perfect Writer)
INSTALLATION DISK (Perfect Writer)
Perfect Speller DISK
Perfect Calc DISK
FILER DISK (Perfect Filer)
PROFITPLAN DISK
CP/M S-BASIC UNIFORM DISK
MBASIC Games DISK
WORD Plus DISK

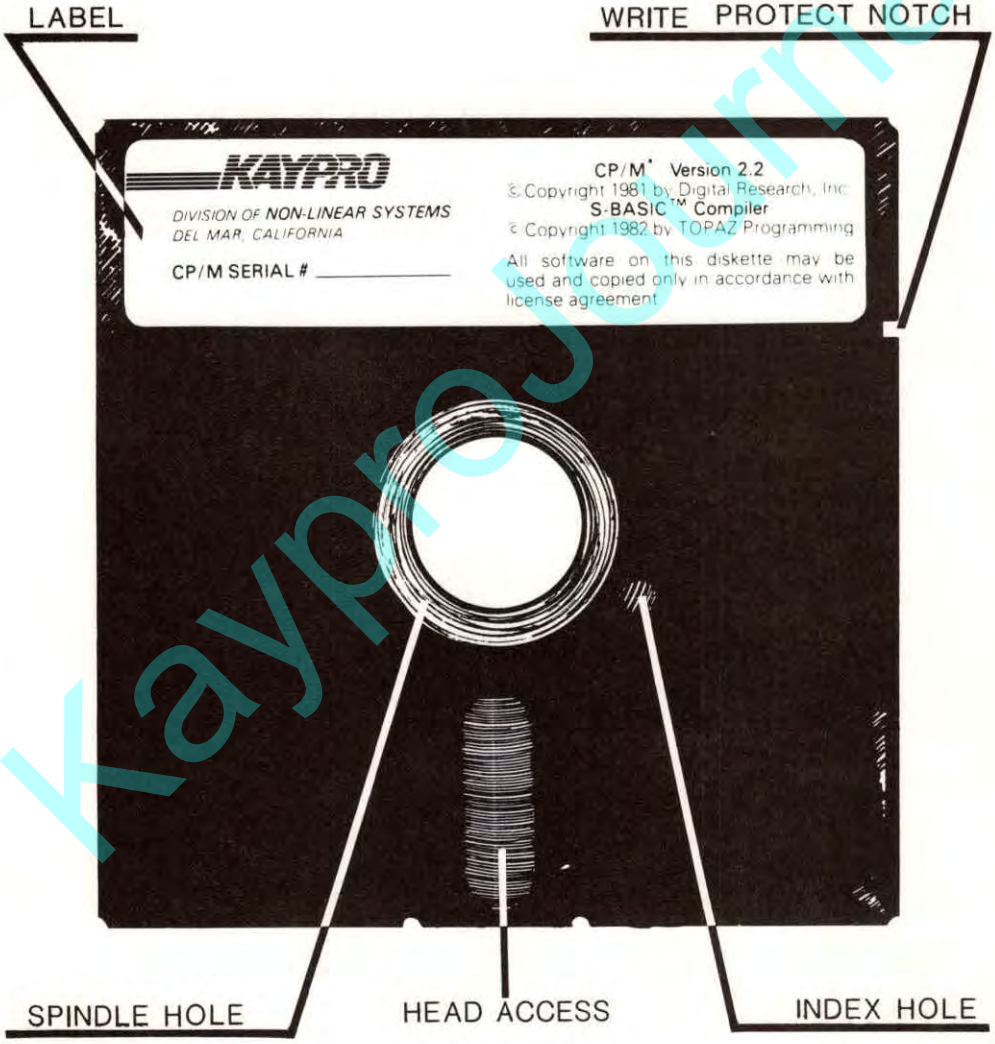
MANUALS

KAYPRO II S-BASIC
KAYPRO II PROFITPLAN
KAYPRO II CP/M
Perfect Filer
Perfect Writer/Perfect Speller
Perfect Calc
KAYPRO II User's Guide
MBASIC User's Guide
WORD Plus User's Guide

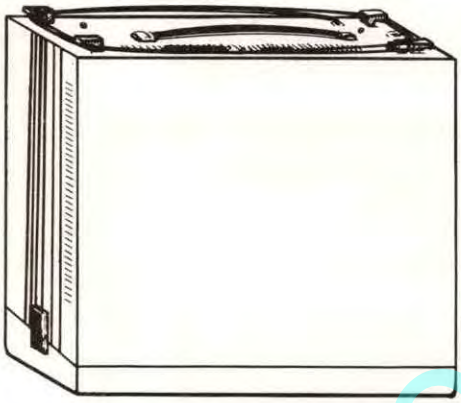
MISCELLANEOUS

3 Perfect Command Summary Cards
Working copy diskette labels
KAYPRO ownership documents
UniForm User's Guide

You will be using 5 1/4 inch single-sided, double-density, soft-sector floppy diskettes to store information with your KAYPRO II. You will need to supply ten blank diskettes for copying your master diskettes and as many others as you need to store information such as: text files, mailing lists, S-BASIC programs, etc.

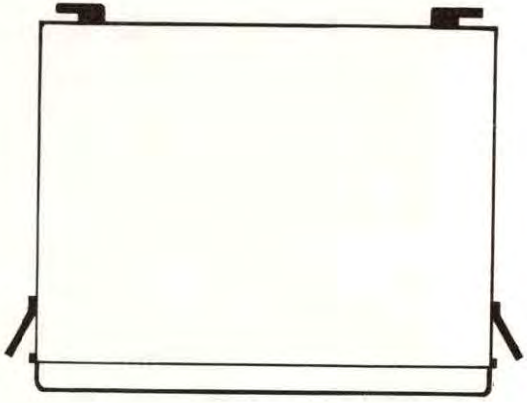


You will want a work surface about 25 inches high with leg room underneath.

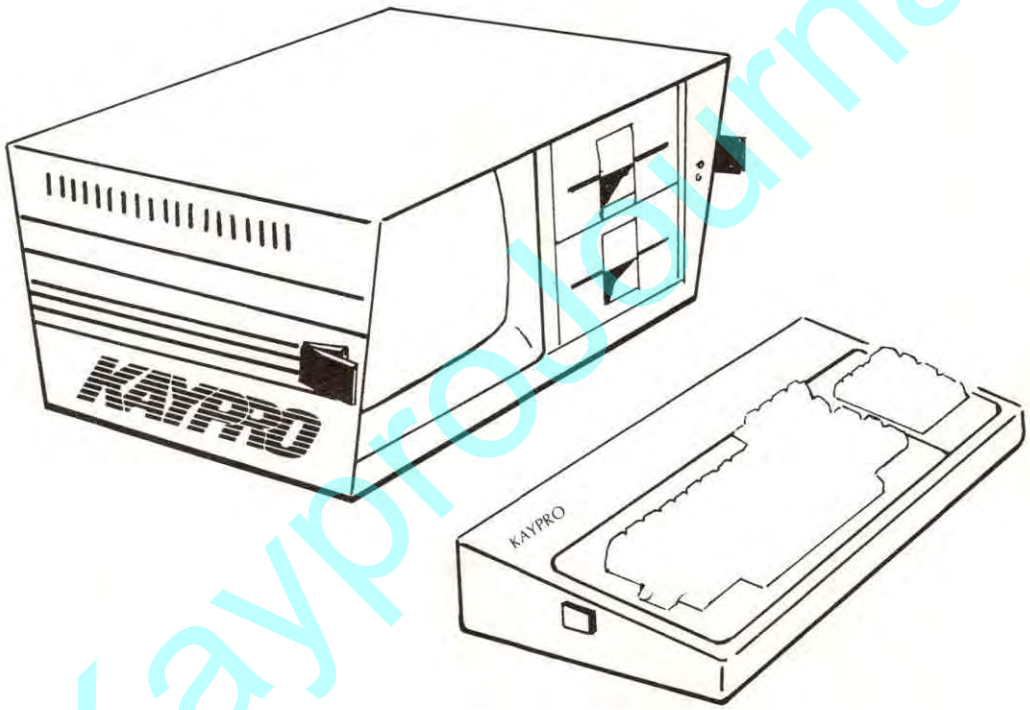


Set the KAYPRO II on your work surface with the blue base facing down. This base actually contains the keyboard.

Push down the tops of the latches on both sides of the KAYPRO, and then pull their bottoms out.

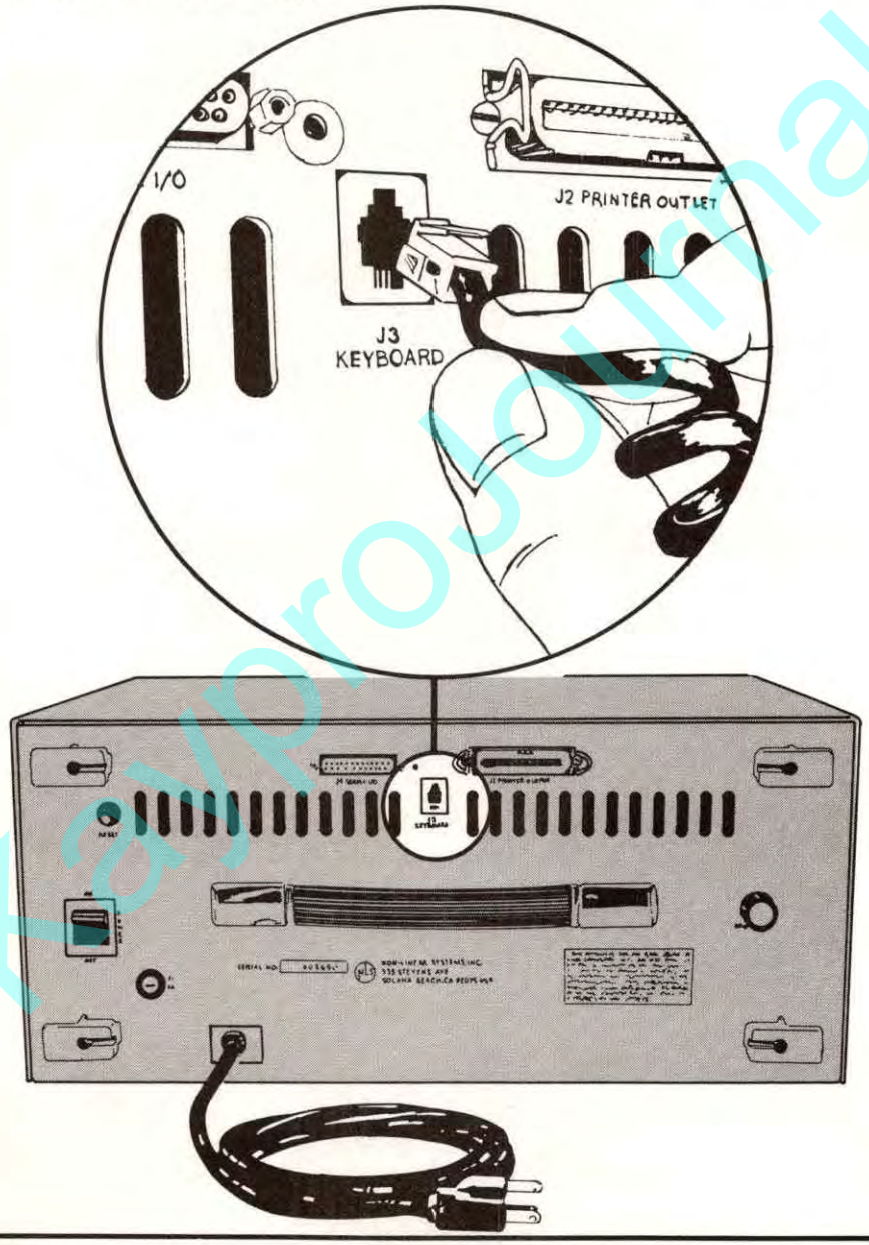


CAREFULLY lift the computer off of the keyboard by the handle on top, and lay it flat on your working surface. The telephone-type coiled cable should be inside.

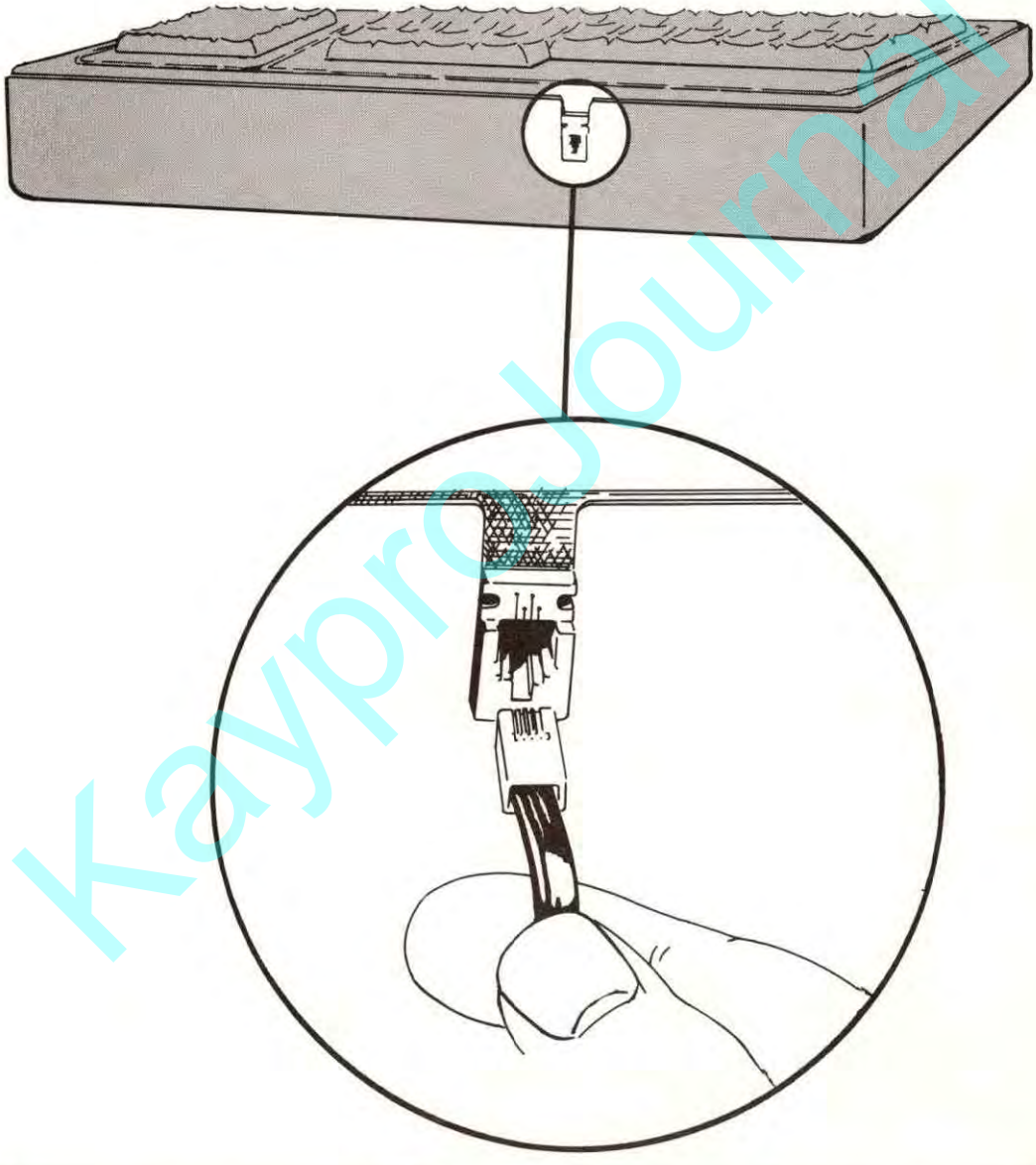


Unwind the power cord from the back panel, but DO NOT PLUG IT IN YET.

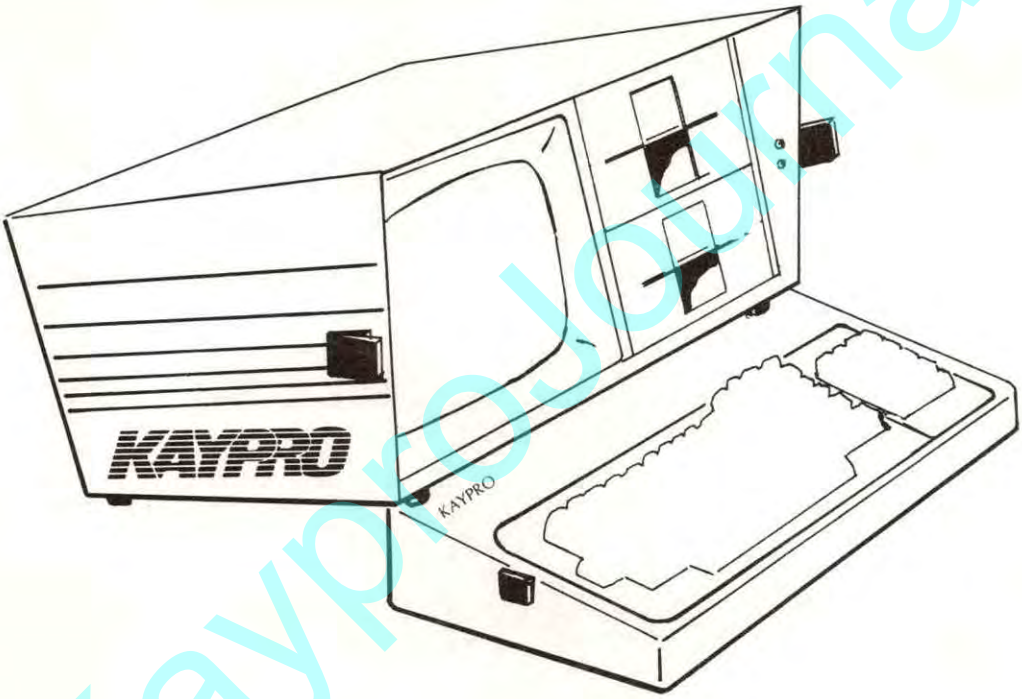
Attach the telephone-type cable to the back panel of the computer in the location marked J3 KEYBOARD. The plastic protrusion on the connector on the end of the cable should face up.



Attach the other end of the cable to the rear of the keyboard. The plastic protrusion should face down.



Lift the front of the computer and set it CAREFULLY with its rubber feet resting on the top rear edge of the keyboard. This tips the display screen to a good viewing angle. You may route the coiled cable under the computer.



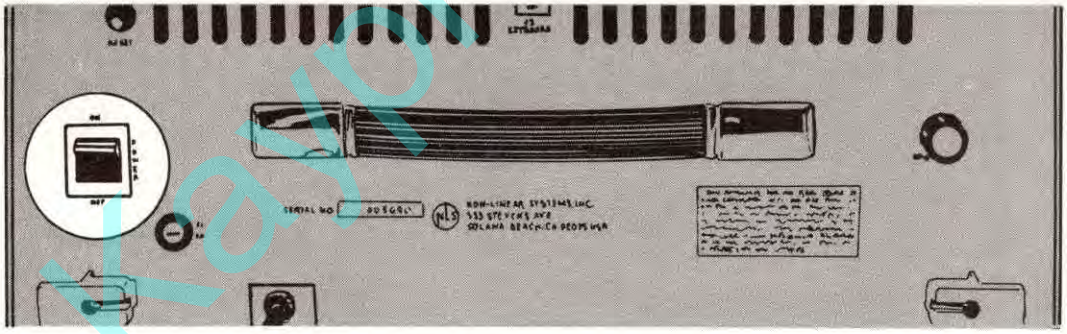
Remove the cardboard disk-drive protectors from each of the disk drives. Keep these with the packing materials. If you ever ship your KAYPRO II, be sure to place these protectors in the disk drives, or the drive warranty will be void.

CONNECTING YOUR KAYPRO TO A POWER SOURCE

Power requirements for the KAYPRO II are 115 to 125 VAC, 50 to 60 Hertz at 60 watts (normal house current). Your dealer can switch the power supply to 220 VAC if you want to take your computer overseas. For power requirements for peripherals (e.g., a printer), check the owner's manual.

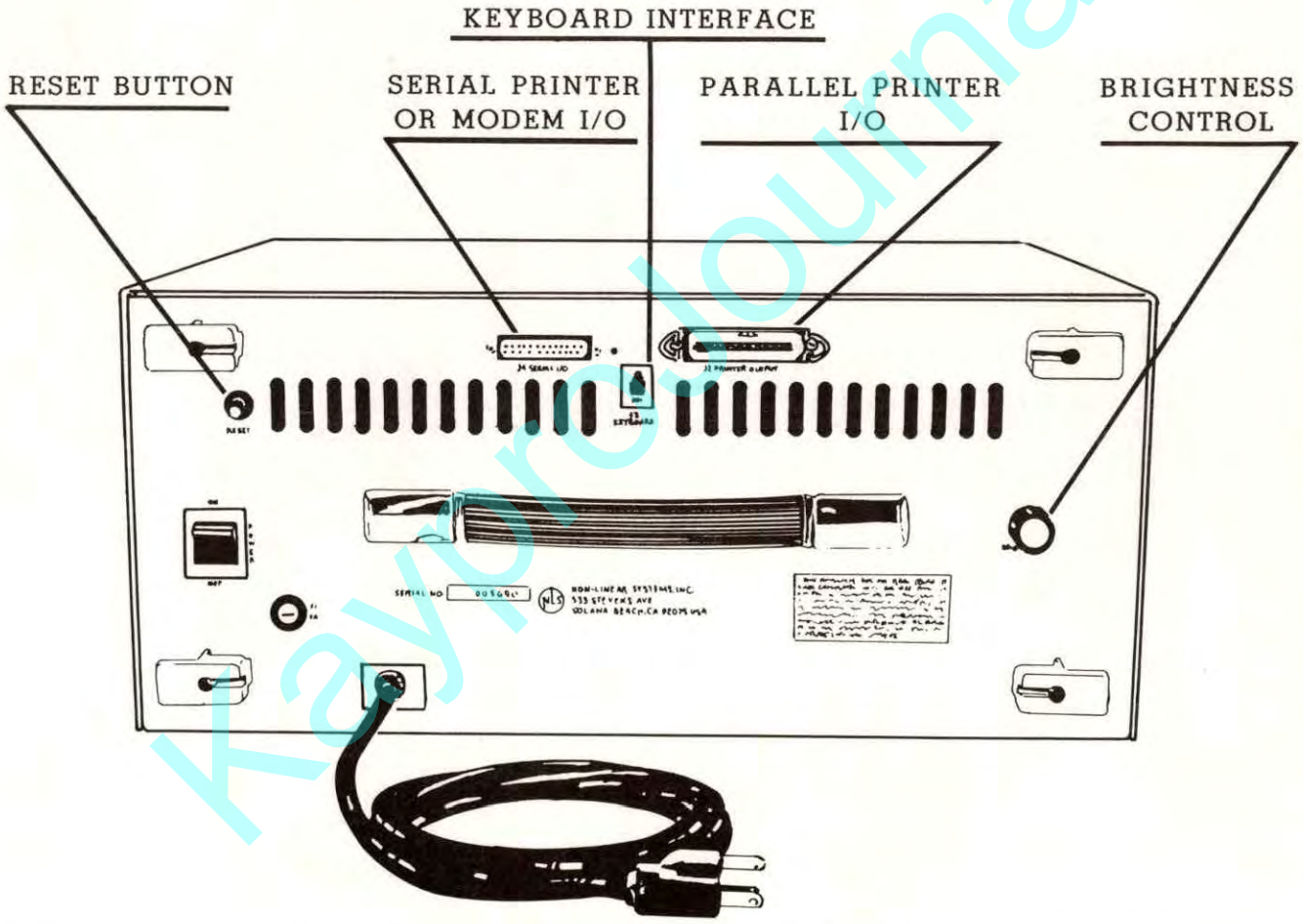
If you have heavy machinery operating from the same power source, or if you experience frequent power shortages, line filtering may be advisable. Line filtering will protect your KAYPRO II from power surges or other undesirable occurrences from the power source. Backup power sources are also available from various manufacturers to provide continuous power in case of a power outage. Contact your dealer for this.

Make sure the ON-OFF rocker-type switch on the back of the computer is turned OFF (down). Then connect the computer to the power source.



Before you turn the computer ON, take the time to read the next section. It contains information regarding memory, the CP/M operating system, the screen, the cursor, and floppy diskettes. If you are unfamiliar with any of these, it would be advisable to read the next section.

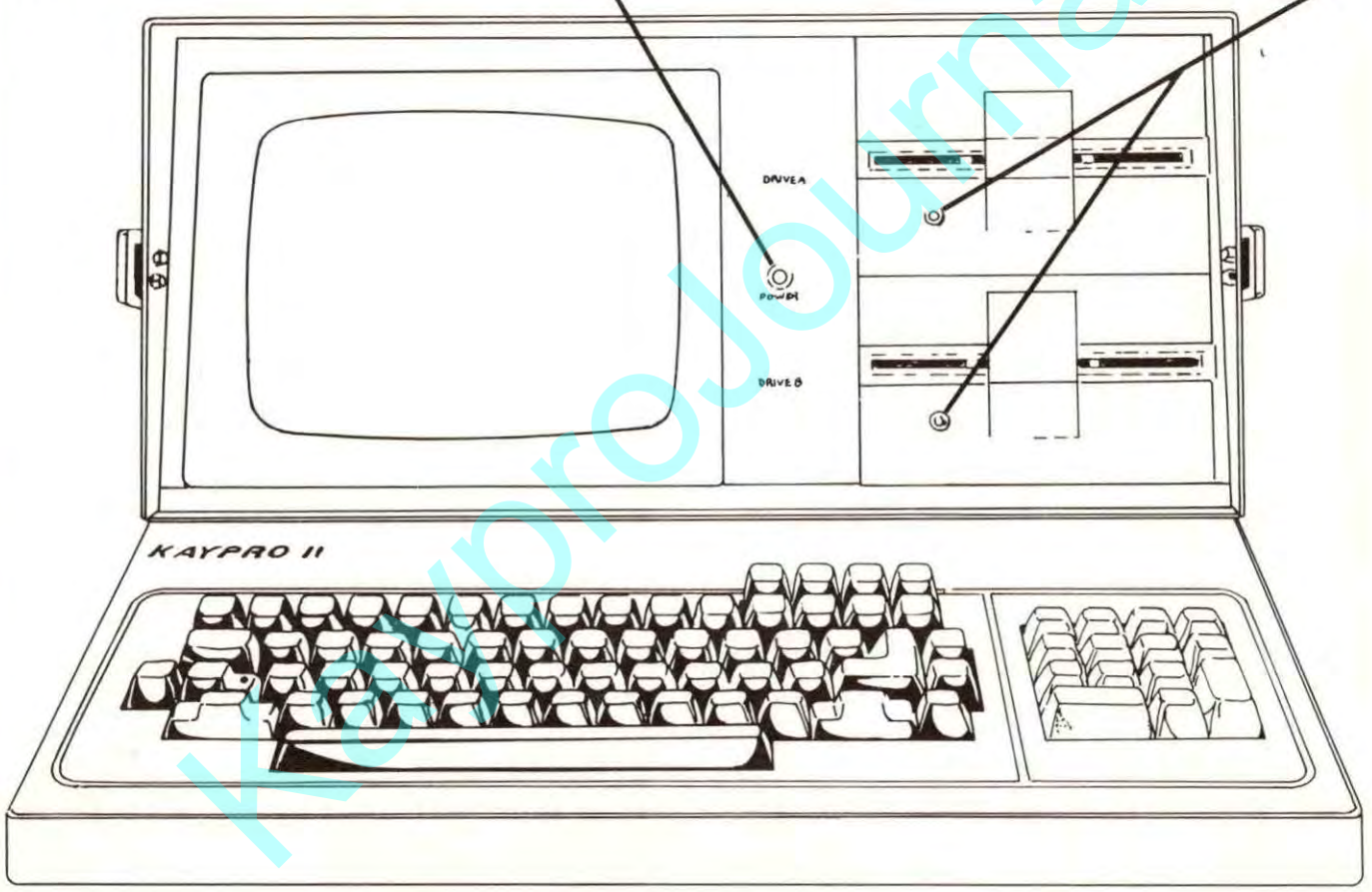
REAR VIEW
CONTROLS SWITCHES AND I/O PORTS



INDICATOR LIGHTS

POWER ON
Small red light on front panel above disk drives tells you that the power is ON.

DISK DRIVE INDICATOR LIGHTS
Small red lights next to the door of each disk drive - tell you which drive was selected last.



KEYBOARD FUNCTIONS

KEYBOARD - The main keyboard has 62 keys and is similar to a typewriter keyboard with a number of additional keys for special functions.

ESCAPE - The ESC key is used for special functions.

TAB - Moves the cursor horizontally a set number of spaces, depending on the program in use.

CONTROL - The CTRL key is used with other letters to perform control functions.

CAPS LOCK - Produces upper-case letters for all alpha keys without affecting numerals.

CAPS LOCK INDICATOR - Small red light indicates you are in the caps lock mode.

SHIFT - Selects the upper character on 2-character keys and upper-case on alpha keys.

DELETE - Deletes the character before the cursor while "echoing" it on the screen. Other functions depend on program in use.

RETURN - Used for carriage return, this key also tells the computer to "execute" and has other uses.

BACKSPACE - Moves the cursor backwards, sometimes deleting the character over which it moves, depending on the program in use.

CURSOR MOVEMENT KEYS - Four keys which move the cursor in the direction indicated by the arrows.

LINE FEED - Same as down cursor movement key.

KEYPAD - 14 keys for entering numeric data rapidly. **ENTER** is the same as RETURN.

BECOMING ACQUAINTED WITH YOUR COMPUTER

MEMORY

Data is stored in a computer in two kinds of memory:

- ☐ **ROM** (Read Only Memory)
- ☐ **RAM** (Random Access Memory)

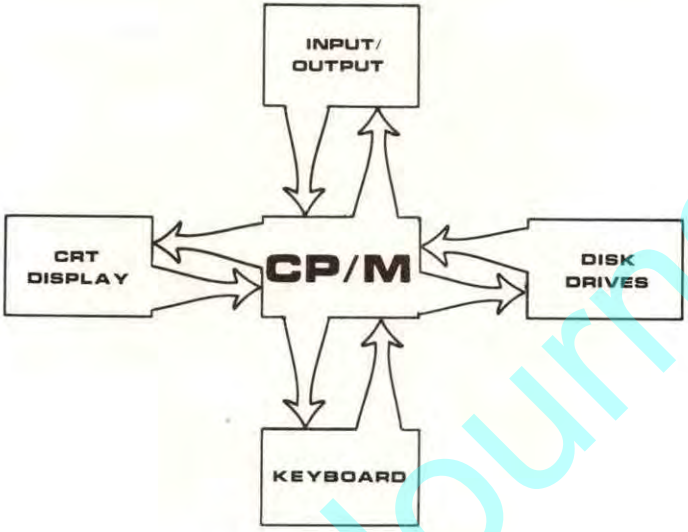
ROM is the smallest portion of memory, only 2 kilobytes (2048 bytes). ROM contains those unchanging programs and information most frequently used.

RAM holds 64 kilobytes (65,535 bytes) of information that may be stored, retrieved, changed, and erased as necessary. RAM can be read from and written to.

RAM memory is lost when the computer's power is turned off, so any program or data stored in RAM has to be saved onto a diskette if you wish to keep it.

The system memory is supplemented by two disk drives. Both disk drives use diskettes that can each hold 191K bytes of information in the form of CP/M files.

CP/M - THE OPERATING SYSTEM



Before you can work with your KAYPRO II, you must load CP/M into the computer's memory. CP/M, the operating system, acts as a middleman between you and the computer, enabling you to:

1) Store and retrieve programs and data

2) Receive and transmit programs and data to and from the outside world

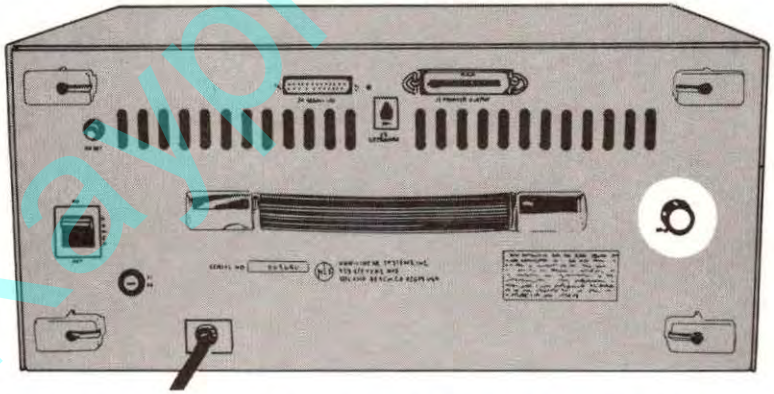
CP/M manages the keyboard, the file system, sends information to a printer and to the display screen, and provides the general environment required for constructing programs, storage, editing, and assembly, etc.

CP/M is on your diskette #1. This is the only diskette that will load CP/M into the computer, or "boot up," after being inserted into drive A. (The other diskettes will display a reminder that you have to make copies of them.)

THE BIG GREEN SCREEN

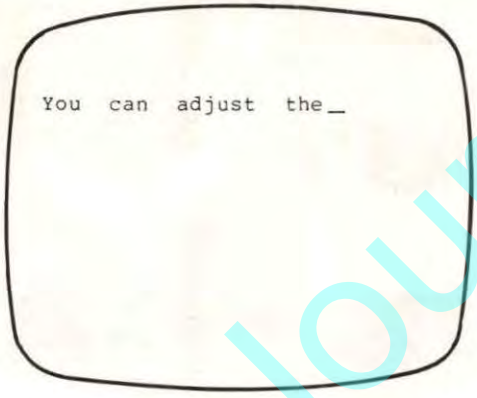
The video screen displays information communicated between you and the computer: Characters typed on the keyboard, information stored on disks, prompts (requests from the computer or a program for you to type in information), etc.

The screen holds 1,920 characters in 80 vertical columns and 24 horizontal lines.

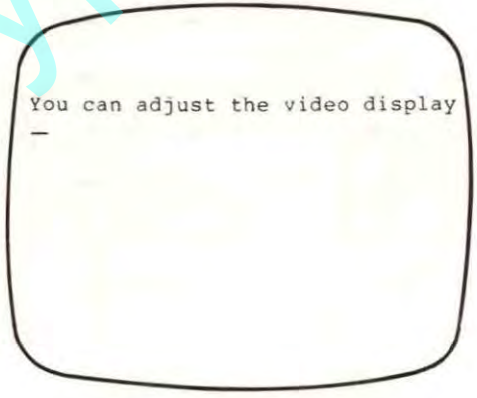


The brightness of the video display can be adjusted by turning the knob on the back panel of the computer. (Note: In order to see the display when you first turn on your KAYPRO II, you may need to adjust the brightness.)

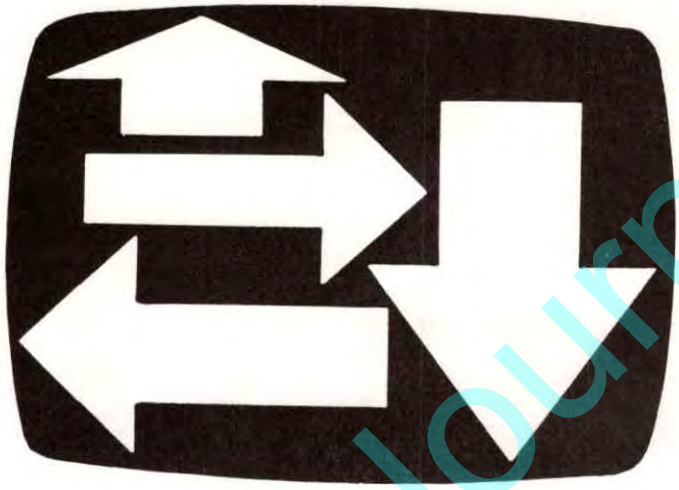
The cursor is a place marker to show where you're working on the screen. It is indicated by a flashing underscore. The next character you type will appear at this location. If the cursor is positioned on a character, that character will flash.



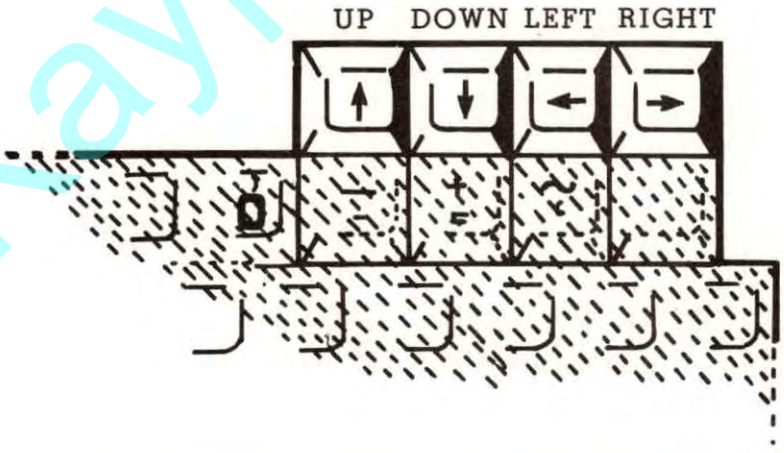
When you are typing, and the cursor reaches the "end of the line," the next character typed automatically ends that line with the last word that will fit and begins the next line--you do not have to press RETURN. This is called wraparound.



CURSOR KEYS



Using the cursor keys, you can move the cursor freely in any direction on the screen:



However, please note that these keys will perform these functions ONLY in certain programs: PERFECT, PROFITPLAN, and certain others--but will not function in this manner in CP/M.

KEYPAD

The cursor keys and the keypad are user-programmable (using the CONFIG program on the CP/M S-BASIC diskette). This means that you, the user, can program them to act as any character or control key that you desire.

DISKETTE INFORMATION

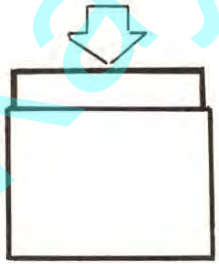
Many types of information can be stored on a diskette: text files, mailing lists, S-BASIC programs, saved reports from PROFITPLAN, etc.

Diskettes store information in the form of files. Depending on how much information each file holds, you can store a number of files on a disk.

The KAYPRO II uses 5 1/4 inch single-sided, double-density soft-sector diskettes, which can store 195K bytes. 4K bytes are reserved for the operating system and other essentials, leaving 191K bytes or approximately 60 typewritten pages of text for you to use to store information. An important consideration when buying diskettes is that, if you value the information you'll be storing on them, don't buy low-quality diskettes.

What follows are a few simple guidelines for handling and using your diskettes to help prevent loss of data.

PLEASE:



* store disks properly

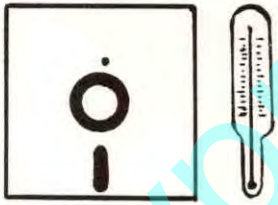
* insert disks carefully

Floppy disks store data on a magnetic surface that is vulnerable to damage which could result in the loss of data.

DAMAGE CAN BE CAUSED BY:

* touching (chemicals or oils on fingers)

* exposure to magnetic fields or equipment



* heat, cold or moisture

* bending or folding

POWER: Do not turn the computer ON or OFF with diskettes in the drives. Always remove your diskettes before you turn the power switch OFF, and have no disks in the drives before you turn the power ON.

MAKE BACKUP COPIES: Make working copies of your master diskettes, and put your master disks away in a safe place (this will be completely covered in the following section). Use your working copies for everyday use. Make backup copies of any disks you make to insure that, if one is lost or somehow damaged, you will still have a copy. Also, store information as you create it, about 2 to 4 times per hour; and store your work whenever you leave the computer, even briefly.

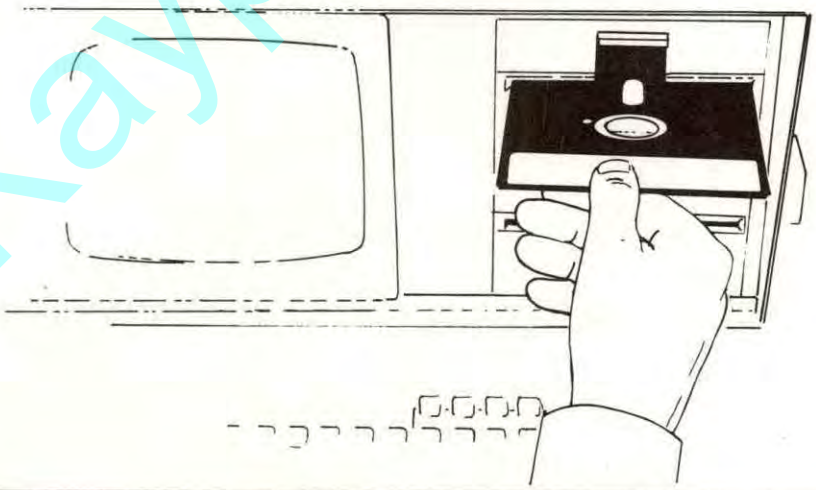
HANDLE DISKS WITH CARE: Do not flex or bend diskettes. When inserting them into the drive, hold disks at the label edge with the label up and the seam side down. No force is necessary to insert them.

KEEP DISKS COVERED: Keep disks in their protective covers when not in use. Do not touch the exposed (brown) portions of the disks.

STORE DISKS SAFELY: Store disks in a clean, dry, cool place away from magnetic fields and away from the computer itself, telephone lines, etc. Do not place disks on top of the computer. Get a box or a commercially-available container for your disks. This helps both to organize your disks and keep them safe.

LABEL DISKS CAREFULLY: Be sure to label and date all new disks, and copies of disks, immediately. Use the KAYPRO labels provided to identify your working copy diskettes. When labeling disks, write the label first, and then stick it on your disk. Use only a soft, felt-tip pen if you must write on a label which is already on a disk. A ballpoint pen can damage a disk.

WRITE PROTECT: An uncovered write-protect notch tells the computer that a disk can be written to and read from. If you cover this notch, the disk can only be read from. In other words, if the write-protect notch is covered, you cannot write onto the disk or format it. So, only cover the write-protect notches of those disks you won't be storing information on. Your Perfect software needs to be able to be write to its disks in order to work properly, so don't cover the write-protect notches of your working copies of Perfect software. Note: Not all diskettes have write-protect notches. For example, the master diskettes that came with your KAYPRO II have none, so that you can't inadvertently write onto them.



MAKING COPIES OF YOUR MASTER DISKETTES

The first, and most important, thing for you to do, after setting up and connecting your KAYPRO II, is to copy each of the master diskettes that came with the computer. What follows is the procedure for making working copies of your master diskettes. The general process is the same every time you copy a diskette. You need to supply ten 5 1/4 inch single-sided, double-density, soft-sectored floppy diskettes to copy all of your master diskettes.

The copy program is on your CP/M S-BASIC diskette. To use it:

step 1. Turn on the power switch of the KAYPRO II.

step 2. Insert the CP/M S-BASIC in drive A, with the label facing up.

step 3. Close the drive door, and wait until the display shows:

```
KAYPRO II 64 CP/M v 2.2

A>
```

step 4. To run the copy program, type: COPY
Press the RETURN key.

step 5. Put a new, empty diskette into drive B with the write protect notch at the left.

step 6. When the main menu appears, type C to use the COPY option.

step 7. When you have read the message on the screen, remove the CP/M S-BASIC diskette from drive A (unless you are copying the CP/M S-BASIC disk itself).

step 8. Insert the diskette you want to copy in drive A.

step 9. To start the copying process, press the RETURN key.

step 10. Watch the track numbers as they are copied (00 through 39).

step 11. When the last track has been copied, there will appear a list of programs which are on the diskette which has been copied, and you will be asked to select one. Press RETURN. CP/M will be written to the disk, and the program will return to the main menu. Remove the diskette from drive A.

step 12. Remove the new working copy from drive B, and label it with the appropriate sticker provided in the software package.

step 13. Put the next diskette you wish to copy in drive A, and go back to step 5 to repeat the procedure until you have made working copies of all your master diskettes.

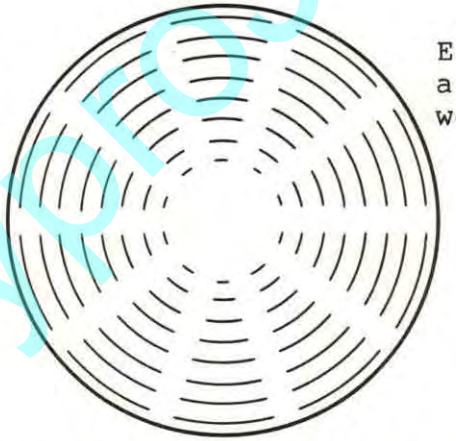
When you are done, you will have ten working copies to use. Store the master diskettes in a safe place. The masters are your originals, in case you have to make other copies of them in the future.

FORMATTING A DISKETTE

Before you can store information on a new diskette (for example, text you want to write with Perfect Writer, or an S-BASIC program), you must first format that disk. When you do this, you prepare the disk so information can be stored on it. If you do not format a disk, then you won't be able to store information on it. (Note: During the copy process, as described previously, the new diskettes in drive B were automatically formatted before the copying took place).

When you format a disk, it is magnetically imprinted with 40 circular tracks, each track having 10 sectors.

Each track is a concentric ring.



Each sector is a pie-shaped wedge.

Illustration of a disk format

To format a disk, you will call up the BLANK option from the copy program. To do this:

step 1. Turn on or reset the computer.

step 2. Insert the working copy of your CP/M S-BASIC diskette in drive A.

step 3. Type: COPY
Press the RETURN key.

step 4. When the main menu appears, type B to use the BLANK option.

step 5. Read the message on the screen, and place a new diskette in drive B.

step 6. Press the RETURN key.

step 7. Watch the screen to see the formatting track numbers (00 through 39). When the last track is formatted, CP/M will be written to the disk. After this, the main menu will appear again. To exit, type E.

The diskette in drive B has been formatted and is now ready to store information.

A TOUR OF THE SOFTWARE

With the PERFECT software programs, you have a fully-integrated package of programs which use the same commands. Perfect Writer has a full array of document design features. Perfect Speller is a 50,000 word spelling checker. Perfect Filer allows you to easily keep mailing lists and other informational data bases. And Perfect Calc is a spreadsheet program which uses the virtual memory feature to give you a greatly-increased data base. Perfect Writer has a self-teaching lessons disk to introduce you to the commands and make its many capabilities accessible.

PROFITPLAN--The Mathematical Spreadsheet

Budgeting, forecasting, and financial planning are available with PROFITPLAN. Computations are accomplished through a series of steps. You select a command, and PROFITPLAN will ask you for the necessary data through questions and prompts on the screen.

S-BASIC--The Compiler

As well as containing all the CP/M files, diskette #1 also contains all the S-BASIC files. S-BASIC is a structured programming language. If you are not familiar with programming, the S-BASIC manual provides both a good introduction and needed reference material.

In addition to S-BASIC, there are three demonstration programs on diskette #1:

* FAC.BAS------computes factorials
* DPLAY.BAS----illustrates file accessing in S-BASIC
* XAMN.BAS-----a disk utility that checks for bad or damaged sectors on a diskette

Microsoft BASIC-80--The Interpreter

M-BASIC is the CP/M version of the high-level language BASIC-80. It is an easy-to-use BASIC interpreter which incorporates features which can be used by both the beginner and the experienced programmer.

Also included on the M-BASIC diskette is O-BASIC (an older version of M-BASIC) and a variety of games.

WORD Plus--The Spelling Checker

The WORD Plus not only checks the spelling of a document, but it:

* looks up correct spelling
* locates anagrams
* counts the words you have written
* locates homonyms
* lists the frequency of words used
* alphabetizes word lists

The WORD Plus is one of the best and most powerful spelling checker programs available.

USING THE SOFTWARE
AN OVERVIEW

What follows are brief descriptions of how to get started using the various software included with your KAYPRO II. They are not intended to be used as full-fledged courses for any of the particular programs discussed. It is highly recommended that you read the User's Guides supplied with each piece of software to fully learn how to use each one.

Another question that may come up: What to do in case of error messages? It is beyond the scope of this User's Guide to tell you just what to do in the case of every possible error message you might see using all the software. There are, however, a few general guidelines concerning error messages of which you should be aware.

Probably the most important thing to do to avoid errors is to restart or reset the computer after you change disks, especially after changing disks in drive A. You can restart the computer by holding down the CTRL key while you press the C key (you'll know that the restart has been accomplished if you see the message, Warm Boot, on the screen). Or, you can reset the computer by pressing the reset button on the back panel.

If you encounter an error, you should determine if it is an operator's error or something wrong with the computer or program before calling your dealer about it. One way of determining this is to see whether the error repeats itself if you try again.

Also, errors frequently occur because filenames are typed incorrectly. A file is what contains information on a disk. A disk can hold a number of files, depending on how large each file is. Each

file has a filename, so the computer, and you, know which file you're talking about. The filename usually has three parts.

B:NAME.MSS

The first part of a filename tells the computer which drive holds the disk containing the file.

The second part of a filename is the actual name part, which can be up to eight characters long, and should be a short, descriptive name of what the file contains.

The third part of a filename is the extent, which can be up to three characters long, and has to do with the kind of file that you're dealing with. For example, Perfect Writer filenames use the extent of MSS, and S-BASIC filenames use the extent of BAS. The extent has to be separated from the name part of the filename by a period (.)

The only characters that you CAN'T use in a filename are:

< > , ; = ? * [ ]

Most of the files you write will be on the disk in drive B. When the file is on the disk in drive B, beginning users often forget to put the B: before the filename. The file seems to be "lost" when it has really gone to the disk in drive A. So, type the proper drive letter plus a colon (:) before the file name.
Also, all lower case letters in file and drive names are changed to upper case, so you don't necessarily have to type in filenames in all capitals.

GETTING STARTED
IN WORD PROCESSING

Included in your software package is a LESSONS DISK which introduces you to Perfect Writer commands and how to use them. We recommend that you go through the lessons programs before using Perfect Writer.

To get started on the Perfect Writer lessons:

step 1. Turn your KAYPRO II on, or press the reset button on the back panel if it's already on.

step 2. Insert your working copy of the EDIT DISK in drive A.

step 3. Insert your working copy of the LESSONS DISK in drive B.

step 4. In response to A>, type: MENU
Press RETURN.

step 5. When the Perfect Writer menu appears, type: E

step 6. When asked at the bottom of the screen what file you want to edit, type: B:LESSONØ
Press RETURN.

LessonØ will appear on your screen after a half a minute. During the lessons, you will be instructed every so often to leave the lesson and then come back. To get back into each lesson from the Perfect Writer main menu:

Type E for edit, then

Type: B:LESSON1 (or whatever lesson number)

Be sure to include B: and don't leave a space between LESSON and the number.

When you reach the point where you want to write a document with Perfect Writer:

1. Have your working copy of the Perfect Writer EDIT DISK in drive A and a formatted disk in drive B (for instructions on how to format a disk, see that section of this User's Guide).

2. Call up the menu, and type E for edit, as described in the previous steps 4 and 5.

3. When asked at the bottom of the screen what file you wish to edit, type: B:<filename>.MSS <filename> is an eight-character (or less) descriptive name of your document-to-be.

4. A new file screen will appear, and you can start writing.

There are two essential commands to learn immediately. One is the Save File command. After you have written some text, you save that text by holding down the CTRL key while pressing the X key (this will be designated as CTRL-X), and then hold down the CTRL key while pressing the S key (CTRL-S). So the Save File command is: CTRL-X CTRL-S. In the bottom left corner of the screen, you will see the message, Writing..., as the file is being saved. The message, File Written, will appear when the file has been completely saved.

The other command you should know now is how to close Perfect Writer when you're through writing (note: You should always save your file before you close). The command to close Perfect Writer is: CTRL-X CTRL-C. This will take you back to the menu, from which you can exit, edit another file, etc.

It would be advisable for you to become familiar with your Perfect Writer User's Guide by this time.

Note: For information concerning configuring Perfect Writer for your printer, refer to the Technical Information section of this User's Guide.

WORDSTAR

If you are using WordStar, insert your working copy WordStar diskette in drive A, and type: WS
Press the RETURN key.

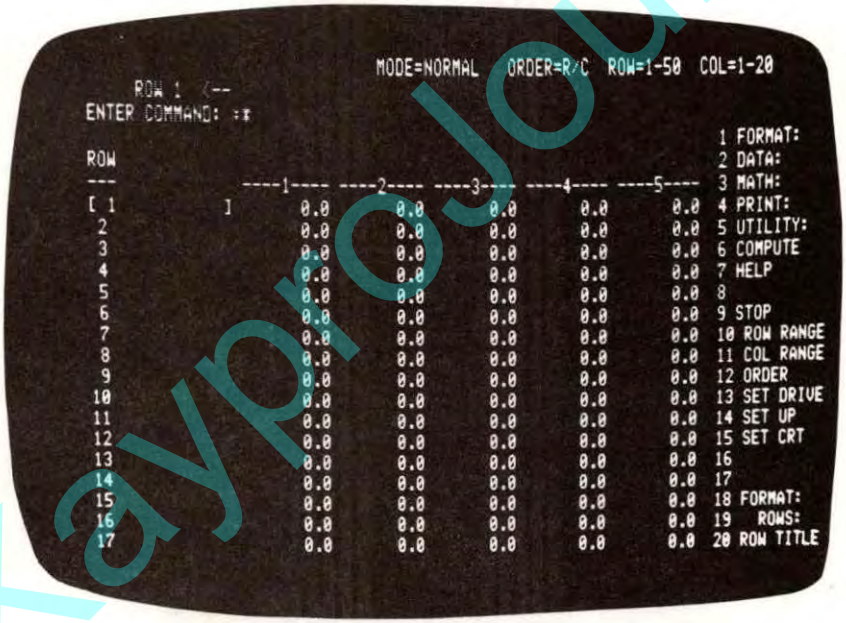
GETTING STARTED WITH PROFITPLAN

step 1. Turn on or reset your KAYPRO II.

step 2. Insert your working copy of PROFITPLAN in drive A. The display will show:

```
A>
```

step 3. Type: PP
Press RETURN. You will see the PROFITPLAN spreadsheet on the screen:



On the right side of the display are the first 20 commands. Commands 1 through 5 are for groups of command headings; typing one of these numbers gives you access to a group of commands:

FORMAT includes commands 18 through 28. With them you can name rows, name columns, specify width and move columns, set decimals, etc.

DATA includes commands 30 through 39. You can enter data, move the data pointer, fix, nullify, and go to.

MATH includes commands 40 through 58. They provide the means to add, subtract, multiply, divide and perform all four operations with a constant, as well as round off, etc.

UTILITY includes commands 60 through 68. These enable you to retrieve your table from a disk, save data on a disk, clear all data, reset, list and erase.

PRINT includes commands 70 through 75. These enable you to choose report options, print reports on the printer, save to a disk file, etc.

A SAMPLE SPREADSHEET

PROFITPLAN comes with a sample table called Sales Forecast. The computer reads it as: SLS-FCST

To call up Sales Forecast, bring up PROFITPLAN, as described in steps 1 through 3.

step 4. Look at the Utilities by typing 5. Press the RETURN key.

step 5. Type 61 to load tables. Press RETURN. You will see:

TABLE NAME: ********

step 6. Type: SLS-FCST and press RETURN. An example will appear.

You may change the numbers in any row or column, using command 31. Once you have changed one or more numbers, you may use command 6, and the entire table will automatically recompute.

If you wish to save this table, give it a new name by typing command 62. Otherwise, only the revised version will remain as SLS-FCST. Now you have two tables:

* The sample, SLS-FCST
* Your own version, named, for example, FCST-TWO

GETTING STARTED WITH PERFECT FILER

Perfect Filer is a program which allows you to create records management systems and store data concerning customers, employees, clients, merchandise, etc. To use all of the capabilities of Perfect Filer, it is recommended that you read the Perfect Filer User's Guide, and follow the tutorials. To get you started:

step 1. Turn on or reset your KAYPRO II.

step 2. Insert your working copy of Perfect Filer in drive A.

step 3. After the A> prompt, type: FILER
Press RETURN.

step 4. The prompt will appear:

Enter disk drive containing data base:

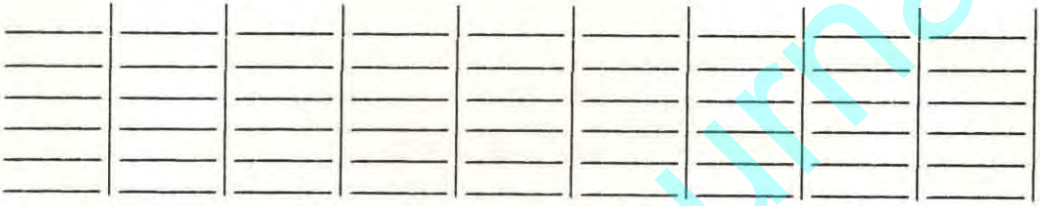
In this case, the Individual Member Data Base is included on the Perfect Filer disk, so enter: A

(Note: When you create your own data bases in the future, or if you use the Organizational Data Base (on the Perfect Writer INSTALLATION DISK), the disk drive containing your data base will be B.)

step 5. From here, you should refer to the tutorial in the Perfect Filer User's Guide. Take your time as you go through it, and don't be intimidated, for this is a complicated program to learn. (Note: RETURN moves the X down a selection menu, BACKSPACE moves it up, and the X key chooses the selection.)

GETTING STARTED WITH PERFECT CALC

This is a "spreadsheet" program. A spreadsheet is a ruled type of paper used in business for putting numbers in the form of a table so that calculations can be done with them.



SPREADSHEET

In computer language, this might also be called a matrix, as it is the "mother" of all the programs which are done in a spreadsheet program.

Perfect Calc has some business, professional, and personal applications already set up for you to use, or you can design your own spreadsheet.

The boxes taken vertically are columns. The boxes taken horizontally are rows.

Using Perfect Calc consists of:

* putting headings over the columns you will use and giving labels to the rows.

* entering the formulas which will tell Perfect Calc which calculations you want done with the data.

* entering data in the boxes.

* watching the calculations being done.

To use Perfect Calc to its fullest, you should read the manual and do the exercises given in the manual.

If, for now, you want to take a peek at Perfect Calc--

step 1. Put the Perfect Calc disk in drive A.

step 2. Push the reset button.

step 3. Type: DIR
Press RETURN.

You will see listed the names of files on the disk, some of which are applications already set up to use as they are or to modify.

step 4. Type: PC CHECK.PC

The PC is to tell the computer that you want to use the Perfect Calc program. CHECK.PC is to tell the computer that you want to use the check file.

While the program is loading, a blank matrix will be displayed.

After the program has loaded, there will be displayed a check register program.

step 5. Move the cursor to the location after:
Beginning Balance =

step 6. Type an amount.

step 7. Press the RETURN key.

There will be a pause while the balance is entered.

step 8. Move the cursor to check number 1.

step 9. Type the number of the check with which you want to start.

step 10. Press the RETURN key.

Watch the numbers automatically change to follow the number you have entered.

For now, skip the data and description columns.

step 11. Move the cursor to the Paid column.

step 12. Type the amount of the check.

The register balance is automatically calculated.

step 13. Press the ESCape key.

step 14. Simultaneously press the shift key and the period (.) key.

The cursor will go to the bottom of the spreadsheet, where you will see a register (records) balance and a reconciliation balance.

When your checks are returned from the bank, you can enter a 1 in the Cleared column by each returned check, and your reconciliation balance will be automatically figured!

You can design your own spreadsheets and put in your own formulas for calculations. Read the Perfect Calc manual to learn to use the program to its fullest.

GETTING STARTED WITH M-BASIC AND THE GAMES

On the M-BASIC diskette, are the following copyrighted files:

```
MBASIC.COM
OBASIC.COM
LADDER.COM
CATCHUM.COM
LADDER.DAT
CATCHUM.DAT
ALIENS.COM
```

O-BASIC is the old version of M-BASIC. You will probably want to write your programs with M-BASIC, because it has more commands to choose from than O-BASIC does.

If you are not familiar with the BASIC programming language, there are a variety of books available on the subject. To get you started:

step 1. Turn on or reset the computer.

step 2. Put your working copy of the M-BASIC disk in drive A.

step 3. After the A> prompt, type: MBASIC
Press RETURN.

step 4. After you see OK on the screen, type in the following:

```
10 INPUT "PICK A NUMBER";X
20 Y = X * X * X
30 PRINT X;" CUBED EQUALS ";Y
```

step 5. To run this program, type: RUN
Press RETURN.

step 6. To return to CP/M, type: SYSTEM
Press RETURN.

This is just a short example. You should read the Microsoft BASIC User's Guide for more details. You should be aware that the M-BASIC diskette is almost completely full of files. So, if you want to save the programs you write, it would be best to save them on a disk in drive B.

Also included on the disk, free of charge, are a variety of games that are in the public domain. These games were written in O-BASIC.

To play any of these free games, type in:

OBASIC <game>

Where <game> is the name of the game you want to play.

To break any game in midplay, type a CTRL-C.

To return to the CP/M operating system after a game is over or after a CTRL-C (you'll see the word "Ok" on the screen in either case), type: SYSTEM and then press the RETURN key.

Also, once you have an "Ok" on the screen, you can call up any of these free games by typing:

LOAD "<GAME>.BAS"

and pressing the RETURN key. <GAME> would be the name of the game you want to play, and it all should

be in capital letters. After the next "Ok," type: RUN

The following is a list of the games and a short description of each:

STRTRK--For the beginner to the expert, this exciting game puts you in command of a Federation star ship, with warp drives, phasers, and photon torpedoes at your disposal to combat Klingons.

TRADE--A game for 1 to 4 players, the object is to establish interstellar trade routes and amass vast amounts of money based on stock purchases, mergings, and splits, using the resulting dividends to buy more stocks and increase your holdings in companies such as BETELGEUSE LIMITED. This computerized boardgame is one of the hottest games going and comes highly recommended (we played game after game of TRADE for 14 hours straight the weekend after we discovered it).

CHASE--Caught in a maze of high voltage fence posts and five security machines, your task is to destroy all of the security machines before they get you.

BLKJK--Play casino blackjack against the computer. You can wager up to $500 with casino rules, including insurance, splits and doubling down.

WUMP--This is the game of Hunt the Wumpus. Try to catch the Wumpus in a cave of 20 rooms while avoiding bottomless pits and super bats. Each turn you can move to another room or shoot a crooked arrow. The Wumpus is sleeping, and if you wake him, he may eat you. Watch out, I smell a Wumpus.

HORSE--Go to the track, and bet on horses to win, place and show. Watch SEA BISCUIT, GALLANT FOX, CITATION and the rest as they're coming around the bend into the home stretch.

ROCKET--This is a lunar landing simulation game where

you start off at 500 feet above the lunar surface at a downward velocity of 50 ft/sec with 120 units of fuel. You specify how much fuel you want to use for each turn and down, or up, you go. Good luck, and keep an eye on your fuel.

MANDALA--Design beautiful and intricate mandalas (symmetrical patterns) by entering numbers. You specify the size in inches and six other numerical factors, and watch the mandala forming before your eyes.

TAXMAN--This well-named game starts off with the question: "Hi, I'm the taxman. Do you want the regulations?" Sound familiar? Well, with this game, you can beat the taxman at his own game. You begin with a list of whole numbers (you decide how many) and play by taking a number from the list. The taxman gets all of the factors of your number that are left. You proceed by choosing numbers until all the numbers are gone, and the one with the highest total wins.

BIO--This computerized study of biorhythmic curves plots your biorhythm for a number of days. You input your birthday in a 6 number string, with the year first, then the month, and then the day (for example, March 2nd, 1948 would be: 480302), and then input the current date in the same manner. The resulting graph indicates whether your physical, mental, and emotional rhythms are high, low, or critical.

The following are the three copyrighted games which are included with the MBASIC disk. To play any of the three games listed below, simply type in the name as shown.

LADDER--A game in which you have lads that you move left, right, up, or down with the blue keypad (4=left, 6=right, 8=up, 2=down, and any other number to stop), and jump over obstacles with the space bar. Avoid the rolling barrels (o's), grab the

ampersands (&'s) along the way for bonus points, and climb up the ladders (H') to the highest level to reach the dollar sign and onto a new screen. Watch out for the fifth screen, though, it's a killer. There are five levels of difficulty, which you can choose before the game, that will increase the speed if you desire. Start off at level one if you know what's good for you.

CATCHUM--This game puts your cats (C's) in a maze of dots, which you eat as you go along, avoiding the monster A's. There are four energy o's that will transform the A's into m's so that you can eat them for bonus points. Also, you can gain extra points by nabbing the dollar sign when it appears. You move with the blue keypad (4=left, 6=right, 8=up, and 2=down). There are 9 levels of difficulty, which can be set before the game starts. The levels of difficulty change the speed of the game. If you're really hot at Catchum, try level 9. It'll cool you down.

ALIENS--Attention, alien invasion in progress! Man the laser base and fire upward towards the encroaching aliens. Get bonus points for hitting the saucers flying across the top of the screen. But watch it, every time you shoot and miss, you lose a point. And every time your laser base gets hit, you lose 25 points. This game is actually six games in one which you can call up from the menu:

1) Bloodbath - For this one, the laser base never stops moving. Fire upward at the aliens, and get them before they crush you.

2) We come in peace - You can stop and direct the laser base left or right in this version.

3) The aliens strike back - In this version, the aliens have the ability to fire back at you, so watch out.

4) Invisible alien weasels - The aliens are invisible here, so keep on your toes. Beeps will let you know when you've got one with your trusty laser beam.

5) Klinker - Here the barriers, as well as the aliens, are invisible. So watch where your laser beam goes when you fire it.

6) The black hole - Hold onto your senses for this one. Not only are the barriers and aliens invisible, but your laser base is too. This one is definitely not for beginners.

To move the laser base left, type a z or a comma (,). To move the base right, type a c or a slash (/). To stop the base, type an x or a period (.). To fire the laser beam, press the space bar. To exit any game, type a q (Note: In the last three games listed above, you will have to type a q twice to exit the game).

CP/M OPERATING SYSTEM

Your KAYPRO II computer uses the CP/M operating system. For a good overview, you should look at a file on your Perfect Writer LESSONS DISK. To do this:

step 1. Turn on or reset the computer.

step 2. Put your working copy of the Perfect Writer EDIT DISK in drive A.

step 3. Put your working copy of the Perfect Writer LESSONS DISK in drive B.

step 4. After the prompt, A>, enter: PW B:KAYPRO.LRN

Viewing this file will give you some very useful information. The following is a brief description of some CP/M system commands and utility programs.

* DIR Provides a DIRectory of files on a disk.

* TYPE TYPEs the contents of a document file on the screen. General form: TYPE B:THATFILE.MSS

* ERA ERAses the file specified. General form: ERA B:THATFILE.MSS

* REN RENames the file specified. General form: REN B:NEWNAME.MSS = B:OLDNAME.MSS

* STAT Provides STATistics about the space used and available on a disk. STAT B: will show how much space is available for use on the disk in drive B. STAT B:*.* will show how much space is used by each file on the disk, as well as how much space is left.

* PIP Copies files from one disk to another. General form: PIP B:=A:THATFILE.MSS The disk in drive B is the destination of THATFILE.MSS, and the disk in drive A is the source of THATFILE.MSS.

* SYSGEN Copies the CP/M operating system onto a disk (stands for SYStem GENeration).

Once again, the preceding is only a brief description of these commands and programs. For more information, look at the file KAYPRO.LRN on your Perfect Writer LESSONS disk, as described previously. Also, read your CP/M manual for more details. Especially read the first 33 pages.

The following programs were developed especially for the KAYPRO II.

* COPY Formats, copies, and sysgens disks.

* CONFIG A program used to reCONFIGure a system diskette. CONFIG allows you to create, for instance, a word processing disk that will boot up expecting a serial printer instead of a parallel printer. CONFIG also allows you to change the baud rate and functions of the cursor arrow keys and the blue keypad.

* BAUD Changes the baud rate of the RS-232C serial interface. (Note that BAUD can change the baud rate, but when the KAYPRO is first turned on or reset, it will be set for a baud rate of 300 baud. To make a baud rate change permanent for a disk, use CONFIG).

* UniForm The two programs, SETDISK and INITDISK make it possible for you to read and write to

programs on Xerox 820 SD, Xerox 820-II DD, Osborne DD, and TRS-80 model I Omikron CP/M disk formats.

Note: The prompt, A>, indicates the currently-logged disk drive. This is the disk drive on which the computer automatically looks for files if the drive name (A: or B:) isn't specified. For example, if you type:

```
A>STAT
```

then the STAT of disk in drive A would be given. You could type:

```
A>STAT B:
```

and the STAT of the disk in drive B would be given.

You can also change the currently-logged disk drive to drive B by typing:

```
A>B:
```

After pressing RETURN, you would see the prompt, B>. Now if you typed:

```
B>STAT
```

you'd see the STAT of the disk in drive B.

COLD BOOT AND WARM BOOT

Cold boot and warm boot are computer slang for two processes which are also called cold start and warm start.

COLD BOOT: When you first turn on your computer, all it can do is put a simple message on the screen and wait for you to insert a disk containing the CP/M operating system in drive A. The process the computer goes through between the time you turn on the power and the time when you see CP/M announce itself on the screen with the A> prompt is called a cold boot. The important thing to know about a cold boot is that the computer can't do anything at first; it has to read the CP/M program from the disk in drive A before it can do any useful work.

Occasionally, strange things may begin to happen, perhaps when you do something in a program that the program/computer doesn't expect or maybe as a result of a "bug"--a hole in the logic of a program. Do NOT pull the plug or turn off the machine. You can destroy information contained on the disks that are in the machine at the time. In such circumstances, the RESET button can be a lifesaver.

If you press the RESET button, you can usually start over again without the damaging side effects you would get if you turned off the power. When you press the RESET button, it is a cold boot, and the computer tries to load the CP/M into its memory from drive A again. But remember that, while RESET can get you out of awkward situations, it can also wipe out useful information that you have put in the computer's memory but haven't stored in a disk file yet.

WARM BOOT: You will need to warm boot often, because when you change disks, the CP/M still remembers the previous disk until you instruct it to change to the new one. Some programs do a warm boot for you when the program is finished, and you will see the message:

```
Warm Boot

A>
```

When CP/M gives you the prompt, A>, it is waiting for you to enter the name of a program you want to run or to give it a warm boot instruction. To give the warm boot instruction, press the CTRL key and the C key at the same time.

Some programs, such as PERFECT, will keep track when you change diskettes, but generally, it is good to do a warm boot whenever you change disks and receive the A> prompt on the screen.

For more information about cold and warm boots, refer to the CP/M manual provided with your KAYPRO II.

GETTING STARTED WITH S-BASIC

Your S-BASIC User's Guide thoroughly introduces you to S-BASIC and provides needed reference material. The first two chapters, however, were written so that you could use any word processing or text editing system to write your S-BASIC programs. The following are those two chapters rewritten specifically for use with Perfect Writer.

To use S-BASIC in your KAYPRO II, you will use two diskettes:

* A Perfect Writer/S-BASIC disk, which will be the disk you use to write your programs.

* A blank, formatted disk, which will be the disk on which you store your programs in the form of files.

You will make the PW/S-BASIC diskette by copying parts of your CP/M S-BASIC and Perfect Writer EDIT disks onto a blank, formatted disk. To do this:

step 1. Turn on the computer or, if it's already on, reset it.

step 2. Put your working copy of the CP/M S-BASIC disk in drive A.

step 3. Put an empty, formatted disk in drive B. (If you don't know how to format a disk, refer to that section of this User's Guide).

step 4. After the A> prompt, type in the following. The asterisk (*) appears when the computer

is ready for another line. After typing each line, press RETURN.

```
A>PIP
*B:=A:SBASIC.COM[OV]
*B:=A:OVERLAYB.COM[OV]
*B:=A:BASICLIB.REL[OV]
*B:=A:USERLIB.REL[OV]
*B:=A:PIP.COM[OV]
*B:=A:STAT.COM[OV]
*
```

step 5. After the last asterisk, take the CP/M S-BASIC disk out of drive A, and put your working copy of the Perfect Writer EDIT disk in its place.

step 6. Then enter the following lines in the same manner as in step 4.

```
*B:=A:PW.COM[OV]
*B:=A:PW.SWP[OV]
*
```

step 7. When you see the last asterisk, take the EDIT disk out of drive A, and put the CP/M S-BASIC disk back in its place. At this point, you should see the following on the screen:

```
A>PIP
*B:=A:SBASIC.COM[OV]
*B:=A:OVERLAYB.COM[OV]
*B:=A:BASICLIB.REL[OV]
*B:=A:USERLIB.REL[OV]
*B:=A:PIP.COM[OV]
*B:=A:STAT.COM[OV]
*B:=A:PW.COM[OV]
*B:=A:PW.SWP[OV]
*
```

step 8. Press RETURN.

step 9. Enter: SYSGEN
Press RETURN

step 10. Wait until the display shows:

KAYPRO SYSGEN VER 2.2
SOURCE DRIVE NAME (OR RETURN TO SKIP)

Type: A

step 11. The message will appear:

SOURCE ON A, THEN TYPE RETURN

Press the RETURN key.

step 12. Wait until you see the message:

FUNCTION COMPLETE
DESTINATION DRIVE NAME (OR RETURN TO REBOOT)

Type: B

step 13. You will see:

DESTINATION ON B, THEN TYPE RETURN

Press RETURN.

step 14. Wait until you see:

FUNCTION COMPLETE
DESTINATION DRIVE NAME (OR RETURN TO REBOOT)

Press RETURN.

step 15. Take the disk out of drive B, and label it: PW/S-BASIC

You now have the diskette you need to begin learning how to program in S-BASIC computer language.

FUNDAMENTALS OF S-BASIC PROGRAMMING

To get you started, let's write a short program in S-BASIC.

step 1. Turn on your computer, or reset it if it's already on.

step 2. Put the PW/S-BASIC disk you made in the last section in drive A.

step 3. Put a blank, formatted diskette in drive B.

step 4. After the prompt, A>, enter:
PW B:TRYOUT.BAS
Press RETURN. You need to include .BAS at the end of your filename whenever you write an S-BASIC program. You have just created a new file.

step 5. Type the following into the file, B:TRYOUT.BAS:

```
PRINT "This is my first S-BASIC program."
```

step 6. Press RETURN.

step 7. Now, to save this program on the disk in drive B, enter: CTRL-X CTRL-S The following will appear in the lower left portion of the screen:

```
File Written
```

step 8. To exit Perfect Writer, enter:

CTRL-X CTRL-C

You will see: Warm Boot

A>

step 9. Then enter: SBASIC TRYOUT.BBX

Press RETURN.

You will see your program written on the screen and the message will appear:

******End of program******

Entering SBASIC TRYOUT.BBX causes the computer to start compiling your program. For more information on compiling, refer to your S-BASIC User's Guide.

It will take a while for the computer to compile your program. When it is done, you'll see on the screen:

Compilation complete

Warm boot

A>

Now, you're ready to run your first program.

step 10. Type in: B:TRYOUT

step 11. Now press the RETURN key. On the screen you'll see:

This is my first S-BASIC program.

Congratulations, you have written and run your first S-BASIC program!

In summary, to create a new file to write an S-BASIC

program, use your PW/S-BASIC disk in drive A and a formatted disk in drive B. Then enter the following after the A> prompt:

```
PW B:NEWFILE.BAS
```

This is just the general form, and you would name the file whatever you decide, instead of NEWFILE.

Write your program. When you have completed it, save the file using the Save File command: CTRL-X CTRL-S.

After the file has been saved (when you see File Written at the bottom left corner of the screen), exit Perfect Writer by typing: CTRL-X CTRL-C. After this, you'll see:

```
Warm Boot

A>
```

To start the compilation process, enter:

```
SBASIC NEWFILE.BBX
```

and press RETURN.

That's the procedure you go through every time: you create a new file to hold a program, write your program, save it, and compile it.

To make a listing of a program on your printer, enter:

```
SBASIC B:NEWFILE.BZY
```

or enter:

```
PIP PRN:=B:NEWFILE.BAS
```

Again, instead of NEWFILE, you'd use the name of your

program.

To see how much room has been used on the diskette in drive B, enter: STAT B: and press RETURN. This will let you know how much space, in Kbytes, is left on the disk. To find out the size of each file on the disk, enter: STAT B:*.* and press RETURN.

So, now that you know the fundamentals of the process of programming in S-BASIC, you will want to read your S-BASIC Manual to learn more about S-BASIC.

Your CPM/S-BASIC diskette contains three basic files that you can compile and run. You should transfer these three files to an empty, formatted disk, using the PIP utility, and compile them there. The three files are:

FAC.BAS - This program computes the factorial of an inputted number.

DPLAY.BAS - This program illustrates the sequential access of a random disk file, specifically working with the RECORD.SEQUENTIAL ON/OFF statement. If this statement is OFF, then all variables of a random record must be read or written in one statement. If it is ON, you can read or write part of a random record.

XAMN.BAS - With this program, you can examine disks for bad sectors, look at and change data in sectors, move sectors, map a disk or a file, and compute logical blocks. When the program first comes up, you have to specify the drive which contains the disk you want to examine (A=Ø, B=1).

TECHNICAL INFORMATION

TROUBLESHOOTING AND MAINTENANCE

If you have any difficulties in operating your KAYPRO II, please take the time to check the following list of symptoms and remedies before calling your dealer. Of course, when programs such as PERFECT or PROFITPLAN don't do what you expect, it would be a good idea to read the appropriate manual.

If the following quick checks don't fix the problem, contact your dealer for assistance. Your dealer should be able to help you with both the operation of your software and the service needed for your KAYPRO II.

SYMPTOM: Programs won't load or execute.

PROBABLE CAUSES AND REMEDIES:

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

2. Video display: Adjust brightness control on rear panel.

3. Disk drive door not closed properly.

4. Disk in drive doesn't contain CP/M or isn't the disk expected by the operating program.

5. Disk isn't in the drive correctly (label side should be up, seam side down, and write protect notch at left).

6. Disk has been damaged. Try making another copy from your master.

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

8. You're asking the program to do something it can't. When all else fails, read your manual.

SYMPTOM: Computer "hangs up" and unexpectedly ignores keyboard entries. It operates fine after pressing the RESET button on the back panel.

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 temporary "brownouts."

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

3. Damaged or faulty disk. Try another copy of your master diskette.

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

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.

THE SYSTEM AT A GLANCE

The keyboard is a detachable unit connected to the computer via a coiled telephone-style cord. The main keyboard consists of 62 keys (including four arrow keys that control the cursor movement). To the right of the main keyboard are 14 keys in a numeric, calculator-style layout. With the exception of a few control keys like CTRL, ESC, and RETURN, all of the keys have an automatic repeat function, including the cursor arrow keys. Both the numeric pad and the cursor control keys are user-programmable, using the CONFIG program on your CP/M S-BASIC diskette.

The video display consists of 1,920 characters in the standard arrangement of 80 columns and 24 rows on a 9" diagonal green screen. The character set consists of the standard ASCII set with the addition of some Greek characters; all characters are mapped into a 5 x 8 display cell.

The CPU used with the KAYPRO II is a Z-80. The computer has 64K bytes of RAM available for program and CP/M usage. On a bank of memory separate from the user RAM reside the system ROM (2K bytes) and the video display memory (2K bytes).

The system memory is supplemented by two single-sided, double-density floppy disk drives, each holding 191K bytes of information in CP/M files.

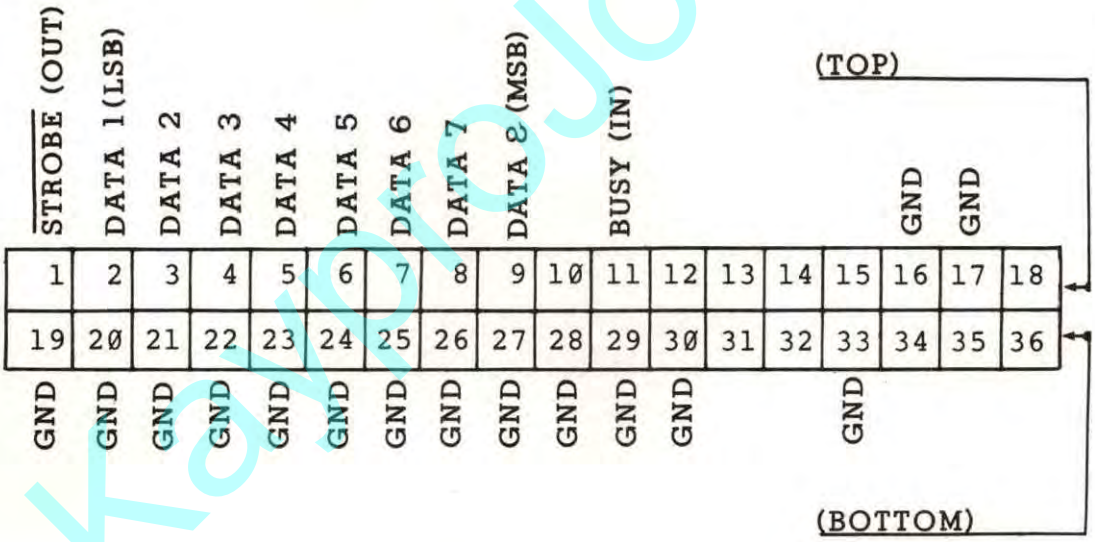
The KAYPRO II also comes equipped with two I/O connectors for use with peripheral equipment. The connector labelled J2 is a Centronics-type connector that should work with most parallel printers. The connector labelled J4 is a standard 25-pin connector for RS-232C serial interface applications. The KAYPRO II is configured as a Data Terminal Equipment interface, which means that you should be able to connect modems through an unmodified RS-232C cable.

CONNECTING A PRINTER

Parallel Printer

Your KAYPRO II computer comes equipped with a Centronics-type connector on the back panel, labelled: J2 PRINTER OUTPUT. If you have a printer with a similar 36-pin connector, then all you need is a standard parallel printer cable (available from your dealer) to connect the two units. If you have a non-standard connector on your printer or cannot find a suitable cable already assembled, then the following pin assignments should prove useful to the person who fabricates your cable.

J-2 INTERFACE



Note that the BUSY line is read by the KAYPRO as ACTIVE when left disconnected. If you tell your computer to print something when there is no printer there, your computer will sit patiently and wait for a printer to say that it's ready for data. And wait and wait and...

Serial Printer

Your KAYPRO II was designed to be as easy to use as possible. The standard KAYPRO expanded system consists of your computer connected to a standard parallel printer via the parallel connector, J2, and to a modem via the RS-232C serial connector, J4. However, if you have a serial printer, you will need to adapt your serial interface for your printer.

The following information is provided to aid such modifications. But please note that Non-Linear Systems and Kay Computers make no guarantees about the suitability of a given serial printer for use with the KAYPRO II's RS-232C serial interface. The reasons for some of the difficulties are given as follows, but before you purchase any serial printer, insist upon a demonstration of its operation.

Three potential snags have to be taken care of if you are to use a serial printer with the KAYPRO II computer:

1. You must tell CP/M to redirect the printer output to the serial interface. Use STAT to change the physical assignment like this: A>STAT LST:=TTY:

   You can make the change from a parallel printer (LPT:) to serial (TTY:) permanent on some of your diskettes by using the CONFIG program on your CP/M S-BASIC diskette.

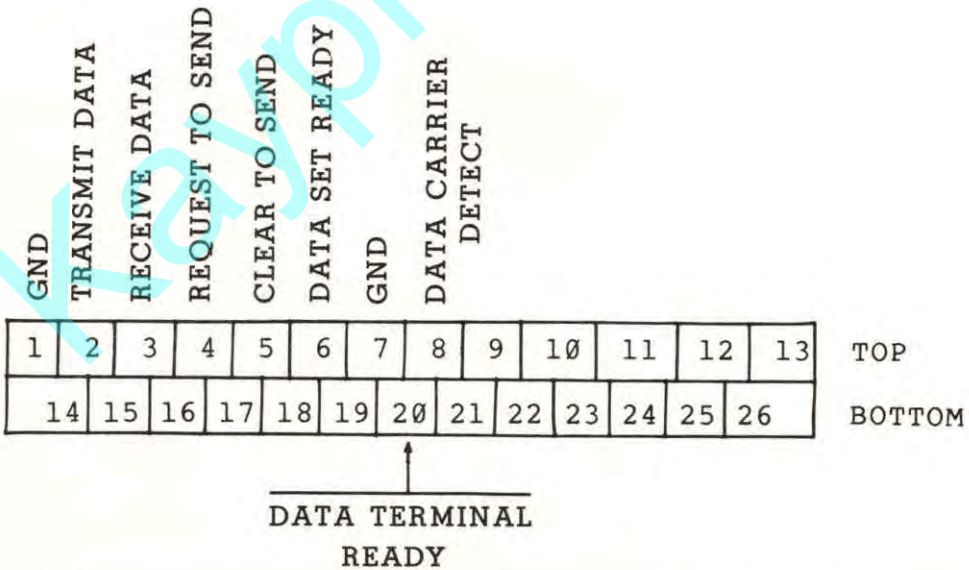
2. You should make sure that the line being used by your computer for data transmission (pin 2 of connector J4) is connected to the printer's data reception pin (this is usually, but not always, pin 3 of the printer connector).

3. The remaining task is to take care of the hand-shaking signal lines. You can strap the signals so that they are always true (i.e., connect pins

8 and 5 of connector J4 to pin 6). The potential problem with defeating the handshaking lines in this manner is that you have to limit your baud rate to avoid overwriting the printer's internal buffer. For example, if you leave the KAYPRO II's baud rate at 300 baud, your printer must be able to print at least 30 characters per second.

If you have problems with overwriting the buffer in your serial printer, you will have to implement some handshaking to correct the problem. The KAYPRO II uses pin 5 (CLEAR TO SEND, see the following figure) as an indicator of printer readiness. For proper handshaking, the serial printer must produce a "not busy" signal for pin 5 that is high when the printer can accept data. Details of the handshaking your printer requires should be in its owner's manual.

CONNECTOR J-4
RS-232 INTERFACE



PERFECT WRITER CONFIGURATION TIPS

If Perfect Writer is not printing properly, you probably need to configure your working copy of the Perfect Writer EDIT DISK for your particular printer. To do this:

1. Turn on the computer, and put your working copy of the EDIT DISK in drive A.

2. Put your working copy of the Perfect Writer INSTALLATION DISK in drive B.

3. Press the RESET button on the back panel, and after the A> prompt, type: B:PFCONFIG Press RETURN.

4. Read the display, and follow the prompts to the master menu.

5. Choose #2 from the menu by typing 2, and then press RETURN.

6. When the printer menu appears, choose #1. If your printer is listed, you will use it in the next step.

7. Choose #5 from the printer definition menu. The current default printer and type for console output will be displayed. If your printer was listed in the last step, enter that name. If your printer wasn't listed, enter: PLAIN (Note: The default printer type, PLAIN, works for most dot matrix printers; the printer type, TELETYPE, works for most letter-quality printers).

8. For the name of the type for console output, enter: CONSOLE

9. Then return to the main menu (choose #6).

10. Lastly, exit the configuration program (choose #6 from the main menu).

One last note: If your printer wasn't listed in step 6, and if the PLAIN, TELETYPE, or VANILLA printer types don't work for your printer, you will either have to define a new printer type (#2 on the printer menu) or update an existing printer definition (#3 on the printer menu), such as PLAIN. You will be asked several detailed questions concerning your printer if you define a new printer type, so either have your printer owner's manual handy or ask your dealer for help.

SERIAL PORT ASSIGNMENTS

For Modem (serial channel A):

PORT 4 is the Z-80 SIO data port PORT 6 is the Z-80 SIO control and status port.

Received character available is obtained by testing bit 0 of the status port; Transmit Buffer Empty is obtained by testing bit 2 of the status port. Other details can be found in the Z-80 documentation available from Zilog.

The serial output is an 8-bit word with one start, one stop, and no parity.

Baud Rate Table

HEX #	Baud Rate
0	50
1	75
2	110
3	134.5
4	150
5	300
6	600
7	1200
8	1800
9	2000
A	2400
B	3600
C	4800
D	7200
E	9600
F	19200

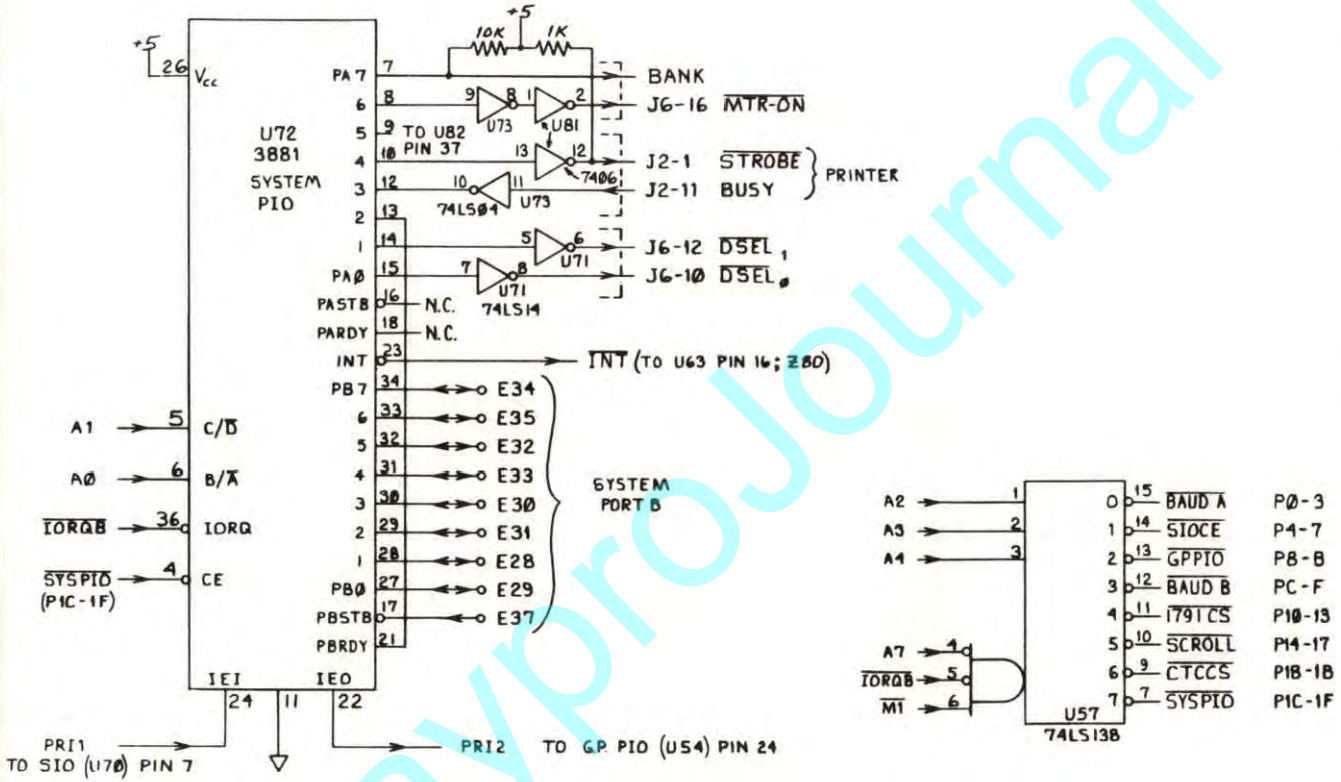
(NOTE: The default baud rate will be 300 baud when the KAYPRO is first turned on or when the reset button is pressed unless you change it with the CONFIG program on the CP/M S-BASIC diskette.)

I/O PORT ADDRESSES

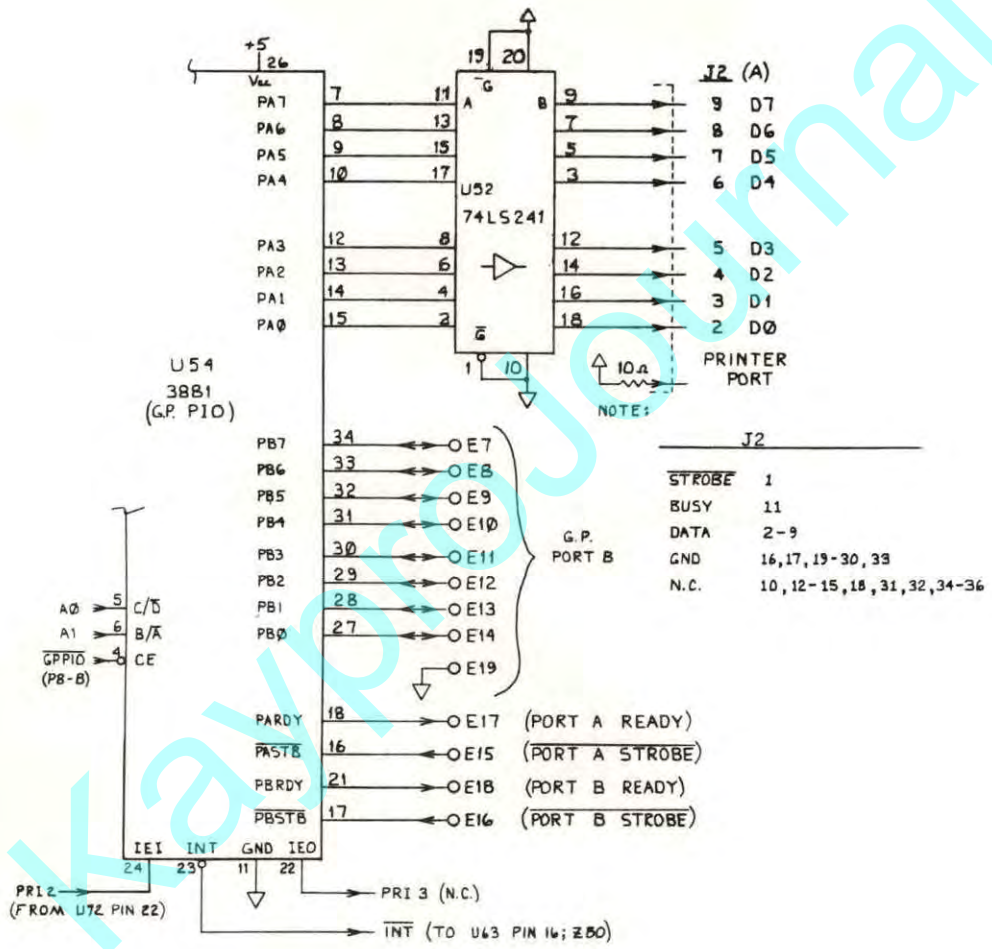
Port #	Use and/or assignment
Ø	Baud rate. (Write only) Writing a number between Ø and F (hex--see preceding table) to this port will set the RS-232C baud rate.
4	RS-232C Serial Data. (R/W) Data register of the Z-8Ø SIO
5	Keyboard Data. (R/W) Eight-bit data from detachable keyboard. See the following S-BASIC program for an example of writing to this port.
6	RS-232C Status. (R/W) Control/status port for the Z-8Ø SIO. See Zilog and Mostek Microcomputer Data Books.
8	Printer Port. (Write only) Eight-bit data to parallel printer connector
ICH	System Port. (R/W) This port is used for system control. The various bits are used for memory bank selection, disk drive control, and printer handshaking.

SAMPLE S/BASIC PROGRAM

```
1Ø REM This program turns off the keyboard beeper.
2Ø VAR QUIET,KEYBOARD = INTEGER
3Ø KEYBOARD=5
4Ø QUIET=8
5Ø OUT KEYBOARD, QUIET
6Ø END
```

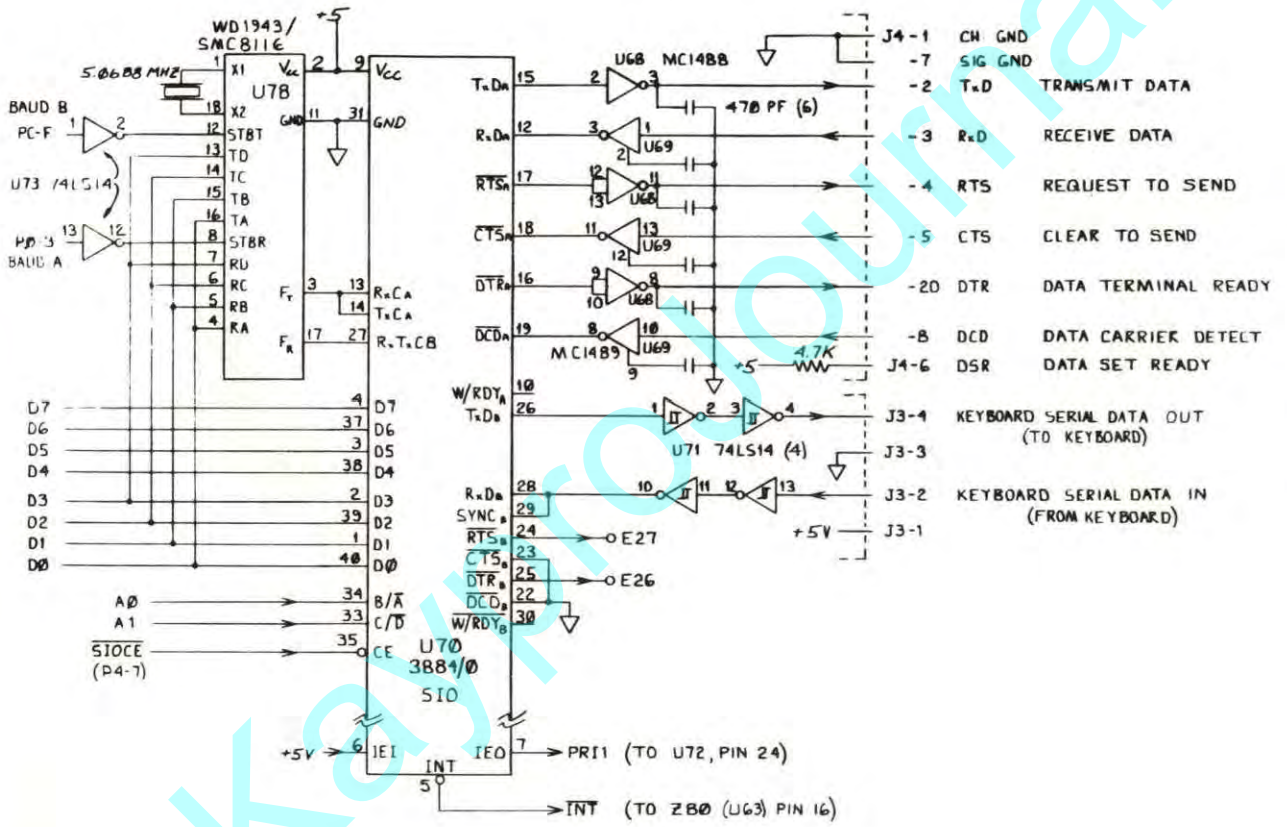


PRINTER PORT

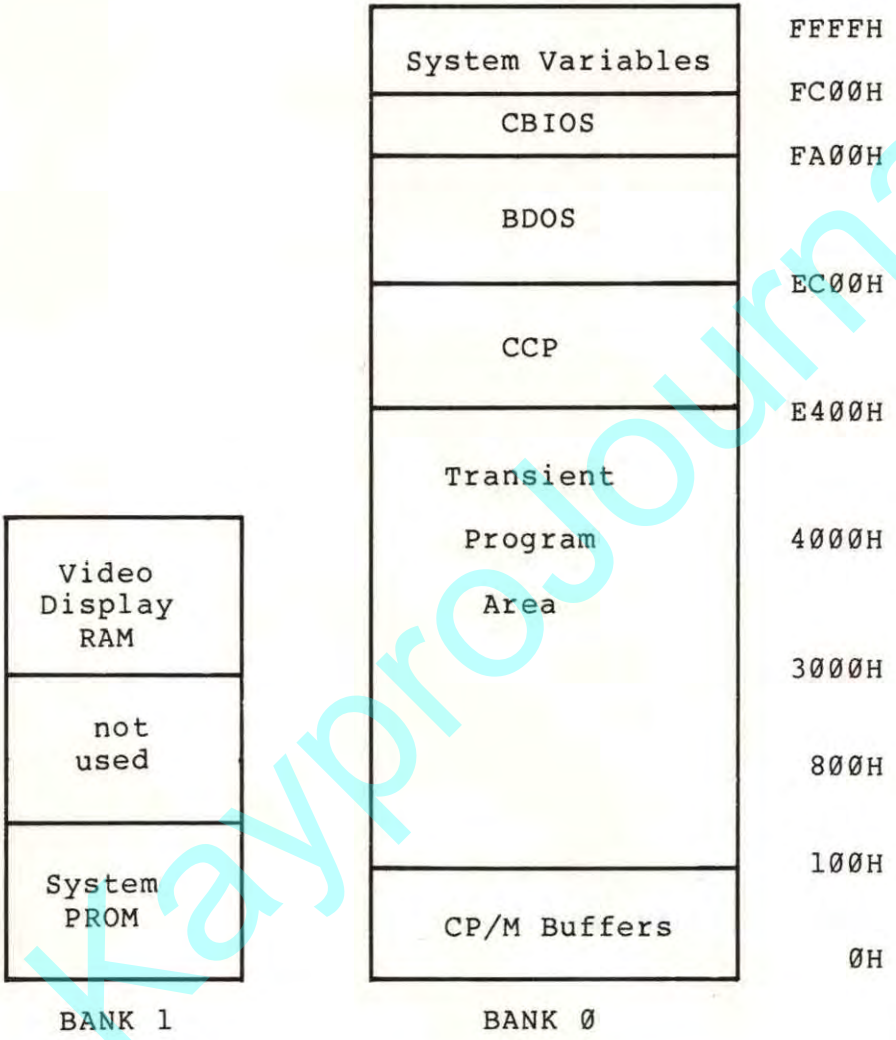


J2

STROBE	1
BUSY	11
DATA	2-9
GND	16,17,19-30,33
N.C.	10,12-15,18,31,32,34-36


WD1943/
SMC8116
5.0688 MHZ
U78
BAUD B
PC-F
U73 74LS14
BAUD A
U68 MC1488
470 PF (6)
U69
MC1489
4.7K
U71 74LS14 (4)
U70
3884/0
SIO
J4-1 CH GND
-7 SIG GND
-2 TxD TRANSMIT DATA
-3 RxD RECEIVE DATA
-4 RTS REQUEST TO SEND
-5 CTS CLEAR TO SEND
-20 DTR DATA TERMINAL READY
-8 DCD DATA CARRIER DETECT
J4-6 DSR DATA SET READY
J3-4 KEYBOARD SERIAL DATA OUT (TO KEYBOARD)
J3-3
J3-2 KEYBOARD SERIAL DATA IN (FROM KEYBOARD)
J3-1
E27
E26
PRI1 (TO U72, PIN 24)
INT (TO Z80 (UG3) PIN 16)

MEMORY MAP OF THE KAYPRO



Please note that only the lowest 16 Kbytes of memory will change with the bank select bit; addresses above 3FFF hexadecimal are always available for either bank.

CONTROL KEY AND FUNCTIONS

The control key (CTRL) is used with other keys to produce several control functions. For some functions, all you need to do is press the control key simultaneously with other keys; for other functions, you must then press the RETURN key to execute the function. For some functions, a character will appear on the display screen; for other functions, there will be no visible indication. When displayed, the control function will appear as two characters side-by-side: The ^ character followed by a second character. For example, ^H (called CTRL-H) represents a backspace.

NOTE: The control functions available to the user depend on the program in use. The same control command can have different functions in different programs. Consult the appropriate software manual to determine which control functions are available.

Common control functions in CP/M programs:

DEL Delete and echo the last character typed at the console (Same as rubout)

CTRL-U Delete the entire line typed at the console

CTRL-X Same as CTRL-U

CTRL-R Retype current command line: types a "clean line" following character deletion with rubouts

CTRL-C CP/M system reboot (warm start)

CTRL-E Physical end of line: carriage is returned, but line is not sent until RETURN key is depressed

CTRL-Z End input from console (used in PIP and ED)

Control functions CTRL-P and CTRL-S cause the following responses in console output:

CTRL-P Copies all subsequent console output to the currently assigned list device (e.g., a printer) and the console device until the next CTRL-P is typed

CTRL-S Stops the console output temporarily: Program execution and output continue when another character is typed at the console (e.g., another CTRL-S). This feature is used to stop output on high-speed consoles, such as CRTs, in order to view a segment of output before continuing.

VIDEO SOFTWARE DRIVER

The KAYPRO II video section was designed to imitate the control sequences of a Lear-Siegler ADM-3A terminal. For most commercial software this means you can "install" or customize the display characteristics by choosing the ADM-3A from the menu. For custom software or those instances where there is no choice of "ADM-3A" on the menu, the following information may help.

****

VIDEO CONTROL SEQUENCES (Those similar to ADM-3A)

Designation	Dec	[HEX]	Action
Bell	07	[07]	Beep sent to keyboard
Backspace	08	[08]	Non-destructive cursor left
Line Feed	10	[0A]	Cursor down
Vertical Tab	11	[0B]	Cursor Up (screen does not scroll)
Form Feed	12	[0C]	Non-destructive cursor right
Return	13	[0D]	
ETB	23	[17]	Clear to End of Screen
Cancel	24	[18]	Clear to End of Line
Substitute	26	[1A]	Clear screen (also homes cursor)
Record Sep.	30	[1E]	Home Cursor

ESCAPE SEQUENCES

ESC A	27,65	Display lower case alphabet
ESC G	27,71	Display lower case as Greek
ESC E	27,69	Insert Line
ESC R	27,82	Delete Line
ESC = row + 32	column + 32	Positions cursor
ESC = [y + 20H]	[x + 20H]	same

Please note that while the normal ASCII printable characters are displayed on the screen, the operation of control codes not documented above is subject to change and may not be what your software expects. As an example, the NULL character (ØH) will be displayed on the screen as an accent grave (`).

SAMPLE M-BASIC PROGRAMS

```
10 PRINT "Changing a decimal number to hexadecimal."
20 PRINT
30 INPUT "Decimal number";Y
40 H$ = HEX$(Y)
50 PRINT
60 PRINT Y "decimal = " H$ " hexadecimal."
```

```
10 REM To output the hexadecimal equivalent of
20 REM a character entered on the keyboard
30 INPUT A$
40 PRINT HEX$(ASC(A$))
```

KAYPRO II
DECIMAL EQUIVALENTS OF CHARACTERS (US ASCII)

32	space	64	@	96	`	128	'
33	!	65	A	97	a	129	α
34	"	66	B	98	b	130	β
35	#	67	C	99	c	131	γ
36	$	68	D	100	d	132	δ
37	%	69	E	101	e	133	ε
38	&	70	F	102	f	134	φ
39	'	71	G	103	g	135	χ
40	(	72	H	104	h	136	θ
41	)	73	I	105	i	137	ι
42	*	74	J	106	j	138	φ
43	+	75	K	107	k	139	κ
44	,	76	L	108	l	140	λ
45	-	77	M	109	m	141	μ
46	.	78	N	110	n	142	ν
47	/	79	O	111	o	143	ω
48	0	80	P	112	p	144	π
49	1	81	Q	113	q	145	Π
50	2	82	R	114	r	146	ρ
51	3	83	S	115	s	147	Σ
52	4	84	T	116	t	148	τ
53	5	85	U	117	u	149	ζ
54	6	86	V	118	v	150	ψ
55	7	87	W	119	w	151	≠
56	8	88	X	120	x	152	≡
57	9	89	Y	121	y	153	ζ
58	:	90	Z	122	z	154	ζ
59	;	91	[	123	{	155	{
60	<	92	\	124	|	156	—
61	=	93	]	125	}	157	}
62	>	94	^	126	~	158	~
63	?	95	_	127	▒	159	▮

GLOSSARY

ADDRESS	a number used by the computer to keep track of different memory locations
ASCII	acronym for American Standard Code for Information Interchange, a 7-bit code for representing character data such as letters, punctuation, etc.
BACKUP	to copy information or programs as a protective measure
BAUD RATE	the speed of serial communications; BAUD is used generally as meaning bits per second: 300 baud would be 300 bits/second or 30 characters per second
BDOS	acronym for Basic Disk Operating System: the section of CP/M that keeps track of disk files
BIOS	acronym for Basic Input/Output System: the section of CP/M that handles the hardware of the KAYPRO
BIT	a binary digit, the smallest piece of information a computer can handle (see BYTE)
BOOT	loading CP/M into the computer's memory from drive A: COLD BOOT occurs when the machine is first turned on or the RESET button is pressed; WARM BOOT occurs when you press the CTRL and C keys simultaneously (see CP/M manual for details)
BUFFER	an area of memory set aside for storing and manipulating data associated with I/O devices such as disks & 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 computer "word" (note: a kilobyte or kbyte is one thousand bytes)
CCP	acronym for Console Command Processor: the section of CP/M that makes sense of what you type on the keyboard
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.
CP/M	acronym for Control Program for Microcomputers: the most popular disk operating system for 8080 and Z-80 microcomputers, CP/M keeps track of the files and programs on the floppy disks and facilitates their use.
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 CP/M command that gives a list of a disk's files. See An Introduction to CP/M Features and Facilities for details
DIRECTORY	the list of files on a disk. Most CP/M

systems allow 64 different entries in the directory (see DIR and STAT).

FILE — a collection of characters, data, or what-have-you that is stored on a disk. A file can contain a program or information to be used by other programs or a manuscript, etc.

FILENAME — the name of a file, which you see when you list the directory or use when you access a file. The general form for a filename is: B:NAME.MSS The first part (A: or B:) 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 extent, is separated from the name by a period, and can be up to three characters long.

FORMAT — the organization of data on a disk--for the KAYPRO II, the single-sided, double-density format consists of 40 tracks per disk, with each track divided into 10 sectors.

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. S-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 disk or tape, and put it into the computer's memory.
MACHINE LANGUAGE	a binary language that a computer can understand, as opposed to either assembly language (see the ASM section of your CP/M manual) or high-level languages like S-BASIC.
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. With the KAYPRO, modems are connected directly to the RS-232C connector at the rear of the machine.
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 (e.g., a printer and modem).
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 (M-BASIC) or a compiler (S-BASIC).
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 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.
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.
SECTOR	a group of bytes on a disk. The standard KAYPRO double-density disk has 10 sectors on each track, with each sector containing 512 bytes of information.
STAT	a program on the CP/M disk that gives the statistics of a disk's files, showing how much space (in kilobytes) each is using and how much empty space if left on a disk.
SYSGEN	a program on the CP/M disk that transfers CP/M from one disk to another.
TRACK	a ring of information on a disk. The standard KAYPRO double-density disks has 40 tracks.
UTILITY	a program that is often used, particularly by system programmers. For example, PIP is a utility program

(details in the CP/M manual) that allows the transfer of files from diskette to diskette or from diskette to peripherals.

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FCC INFORMATION

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.

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.