Rembrandt

Complete Business Graphics Toolkit

This package is for these Kaypro computers:

2-84, 2X
4-84, 4E, 4X
10, 12X
Robie

BD SYSTEMS

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REMBRANDT — Business Graphics Toolkit

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INTRODUCTION

The REMBRANDT Business Graphics Toolkit is an integrated software package which allows you to effectively and easily use the powerful graphics capabilities built into your Kaypro 2, 2X, Kaypro 4-84 (also called the '4E'), the 4X, the Kaypro 10, 12X or Robie computer.

The full package has three easy-to-use components that will allow you to create electronic pictures on-screen and send them to your printer, create business graphics from your numerical data and to present on-screen presentations and briefings.

The first REMBRANDT component is KBOARD — the Kaypro Electronic Drawing Board program. KBOARD gives you easy access to all the graphic and alphanumeric characters available on your machine. With KBOARD you can create, edit and save graphic screens with simple and easy-to-learn commands.

KBOARD is ideal for creating game layouts, simple bar graphs, data-entry forms, logos, or electronic pictures. These graphic creations may be saved on diskette for later recall or editing. Additionally, routines are provided which allow you to print your graphic displays on most popular dot-matrix and daisy wheel printers.

The second component of the REMBRANDT Business Graphics Toolkit is a group of plotting and graphing programs collectively called KGRAPH. The KGRAPH Plotting Package allows bar charts

(both vertical and horizontal formats), pie charts and xy plots to be easily created and saved to disk. These disk files may then be printed on most popular dot-matrix and daisy wheel printers by using routines supplied with the package.

The charts and plots produced by KGRAPH are fully labeled, easy to read and are suitable for inclusion in reports and other documents. Axis and scale limits can be supplied by the user or can be generated by the programs in an "autoscale" mode. The programs can accept data entered at the keyboard or can read output data files produced by other programs written in almost any language. The general chart formats may be changed as often as desired and charts may be instantaneously previewed on-screen at any time during the chart making process. Chart or graph formats that are used regularly may be saved in FORMAT files and loaded any time a certain style of chart is needed.

All the plotting programs use a common menu structure and a common command format which allows users to easily transition from one program to another without having to learn new command syntax.

Graphic disk files created with the KGRAPH programs are compatible in format with disk files created with the KBOARD graphics editing package and with the KBRIEF electronic slide show utility package.

The final REMBRANDT component is KBRIEF, the Kaypro Electronic Briefing System. KBRIEF allows any number of graphic screens to be easily sequenced and displayed on a Kaypro computer. KBRIEF is intended to be used with graphic data files created with the KBOARD graphics editor package or with chart and graph files generated with the KGRAPH plotting package.

KBRIEF is the ideal tool for creating automated briefings, electronic slide shows, self-running demonstrations, sales aids or for just about any use that requires attended or unattended presentation of graphic data.

KBRIEF reads a master file containing a list of the names of the graphics files to be displayed. For each file, a display code and a time code is specified. The display code determines how the file will be displayed on the screen. Possible display options include wipe left, right, up, down, fade in, fade out and many more. The time code specifies how long the file will be displayed on the screen — values from 0 to 98 seconds are allowed. Additionally, a special mode is available in which the file will remain displayed on-screen until any key is depressed.

The KBRIEF package includes a utility program, CHANGE.COM, which automatically changes text files into KBOARD format graphic files.

KBRIEF is user friendly and its clear and easy-to-understand error messages will allow you to get your electronic presentation "on the air" in a minimum of time.

By this time you're probably anxious to see what this software package can do. But before we begin to learn how to use the REMBRANDT Business Graphics Toolkit, a few basic steps are required. First, a note about abbreviations. In this manual, pressing the key labelled "RETURN" is indicated as "<cr>" or "RETURN". Control key sequences, such as CTRL-D, are produced by holding down the key labelled "CTRL" (at the left of your keyboard) while you simultaneously press the desired letter. For CTRL-D, your would hold down "CTRL" and press "D".

REMBRANDT is supplied on two single-sided diskettes. Diskette #1 contains KBOARD, KBRIEF, associated programs and sample files, and the printer drivers. Diskette #2 contains the plotting and charting programs and sample files. Before you begin to use the software, you must make working copies as described below. Use the procedure which applies to your specific machine.

For Kaypro 2-84 users:

1. Make copies of the two diskettes supplied with this package using the COPY program which came with your computer.

2. Place a copy of the CP/M system on each of the diskettes using the SYSGEN program supplied with your computer. SYSGEN operation is described in your operating system documentation.

3. Place the original distribution diskettes in a safe place and use only your working diskettes for day-to-day operations.

For Kaypro 4-84 and 2X users:

1. Format a blank diskette using the utility programs supplied with your computer. Next transfer the program PIP.COM to the blank diskette.

2. Place a copy of the CP/M system on the newly made diskette using the SYSGEN program supplied with your computer. SYSGEN operation is described in your operating system documentation.

3. Place the new disk into the A: drive and type CTRL-C to reset the system (i.e. perform a Warm Boot).

4. Place REMBRANDT Diskette #1 into the B: drive.

5. Type PIP followed by <cr>. The PIP program will be loaded and you should see the '*' prompt. Then type "A:=B:*.*" followed by <cr> to copy all files from the B: drive to the A: drive.

6. When the transfers are complete, place REMBRANDT Diskette #2 into the B: drive and again type "A:=B:*.*" at PIP's '*' prompt. This will copy the second diskette onto your working diskette.

7. Place the original distribution diskettes in a safe place and use only your working diskette for day-to-day operations.

For Kaypro 10 users:

1. Press CTRL-C to reset (Warm Boot) the system.

2. Place the REMBRANDT Diskette #1 into the floppy drive and use the PIP program to copy all the floppy's files to a vacant user area on the hard disk. For example, to move the floppy files to the "A" drive, user area six, type "USER 6<cr>" followed by "PIP A:=C:*.*[vg0]<cr>" at the "A6>" prompt.

3. Place the second REMBRANDT diskette into the floppy drive and repeat the PIP operation outlined in paragraph 2 above. Now all REMBRANDT files have been copied into the correct user area on your hard disk.

4. Place the original distribution diskettes in a safe place and run the programs only from the hard disk during day-to-day operations. The examples in this book assume that you are logged into the correct drive and user area at all times.

For Kaypro 12X users:

1. Use the MFDISK program supplied with your computer to configure the floppy disk drive as a Kaypro single-sided disk drive.

2. Follow steps 1 through 4 as described above for the Kaypro 10 computer.

For Robie and Kaypro 4X users:

1. Create a blank formatted diskette using the utilities supplied with your computer. SYSGEN the disk and place a copy of the PIP program on this new disk.

2. Use the MFDISK program supplied with your computer to configure the B: drive as a Kaypro single-sided disk drive. Place REMBRANDT Diskette #1 into the B: drive.

3. Place the "new" diskette you created in step 1 into the A: drive and press CTRL-C to reset the disks. Now type "PIP<cr>" to invoke the PIP program. At the PIP prompt, type "A:=B:*.*[v]" to copy all of the files from the distribution diskette onto your working diskette.

4. Now, place the second REMBRANDT diskette into the B: drive and repeat the PIP procedure in paragraph 3 above to copy the rest of the REMBRANDT files onto the floppy in the A: drive.

5.Place the original distribution disks in a safe place and run only the working diskette for day-to-day operations.

USING KBOARD

The KBOARD program allows you to create graphics on-screen and save them to disk. The files may be recalled and re-edited at a later time and printed on most printers.

For the Impatient User

Place the KBOARD working diskette in Drive A and a formatted blank diskette in Drive B. (Kaypro 10 and 12X users: log onto the drive and user area containing the appropriate files.) At the CP/M A> prompt, type "KBOARD" and press RETURN.

After the program loads, the KBOARD logo displays for a few seconds followed by a menu. Use the up/down arrow keys to select 'LOAD Picture from Disk' and press RETURN. When the program asks for a filename, type "KAYPRO<cr>". In a few seconds the message 'Loading file: KAYPRO' will appear followed by the standard menu prompt. Now select 'Enter DRAWING BOARD Mode' and press RETURN — in a few seconds you should be looking at a 'self-portrait' of a Kaypro computer.

When you're done admiring your work, press "ESC" to ESCape from the drawing board mode and return to the menu. This time select 'COMMAND Summary' and press RETURN to see a summary of all the commands available in the drawing board mode. To find out how to use all these commands to create your own pictures, press

ESC to return to the main menu, select the 'EXIT to CP/M' option and read the next few sections of this manual.

The KBOARD Files

The following files are associated with the operation of the KBOARD full screen graphics editor:

KBOARD.COM — This is the main program used for drawing, editing and storing graphics data.

KAYPRO, COMMANDS, BORDER — These are sample graphics files created with the KBOARD package. These samples are included to show the versatility of, and some of the uses for KBOARD generated files.

The MENU

When you start KBOARD, the first thing that you'll see following the logo is the menu. The menu allows you five possible selections:

Enter the DRAWING BOARD Mode — Enter the drawing board mode to edit or view the current picture or to create a new one.

LOAD Picture from Disk — Load into memory a picture previously saved to disk.

SAVE Picture to Disk — Save the current display on diskette for later retrieval and use.

COMMAND Summary — Display a brief summary of the KBOARD commands.

EXIT to CP/M — Exit from the program and return to CP/M.

To make a selection from the menu, simply use the up/down arrow keys until the desired selection is highlighted — then press RETURN. You may change your mind and press the arrow keys to make another selection at any time before you press RETURN.

Each of these menu selections is described in detail in the sections that follow.

EXIT to CP/M

The first option we will use is 'EXIT to CP/M'. This exits you from KBOARD and returns you to the CP/M A> prompt. Position the menu selection bar over 'EXIT to CP/M' and press RETURN. KBOARD will ask you if you really wish to exit. This is your last chance to change your mind and abort the exit process. If you have forgotten to save the current display, hit any key other than the Y and you will be returned to the menu. Since at this point, we have not created any new displays, press Y for Yes and you will be returned to the CP/M A> prompt. To re-enter the KBOARD program, type KBOARD and RETURN.

Enter DRAWING BOARD Mode

The drawing board mode allows you to create or edit a picture. To understand the drawing board mode, we'll first learn how each command works and then create a simple picture.

To begin, select 'Enter DRAWING BOARD Mode' on the main menu and press RETURN. The cursor, a small steady block, will appear in the upper left hand corner of the screen. The position of cursor indicates where the next character you enter will appear. The arrow keys allow you to move the cursor LEFT, RIGHT, UP and DOWN.

To get a feeling for the cursor control, try moving the cursor around the screen using the arrow keys. The cursor controls let you move quickly and easily to any of the 1920 possible screen positions.

Now that you have experimented with moving the cursor, let's see what some of the graphics characters look like. Graphics characters are entered by merely pressing the numeric keys (i.e. '0' through '9'). Each one of these ten keys may be programmed to send a different graphic character to the screen. (You'll learn how to program the keys

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                COMMAND SUMMARY in the DRAWING BOARD MODE

Toggle Commands:
      ^R    Reverse video (ON/OFF)          ^I    Intensity Dim (ON/OFF)
      ^F    Flash (ON/OFF)                  ^A    Auto repeat (ON/OFF)
      ^G    Graphic Mode (GRAPHIC/ALPHA)    ^U    Underline (ON/OFF)

Block Mode Commands:
     ^BB    Block Begin                     ^BE   Block End
     ^BC    Block Copy                      ^BM   Block Move
     ^BD    Block Delete                    ^BS   Block Show
     ^BF#   Block Fill w/character #        ^BU   Block Undo

Miscellaneous Commands:
      ^M    Mode Display                    ^C    Command summary
      ^N    New Screen                      ^P    Program graphic keys
     ESC    ESCape to main menu              #    Draw programmed character
```

Figure 1: The COMMAND SUMMARY Screen

later in this section.) When KBOARD is first started, the number keys are pre-programmed with the graphic characters required to draw a box. Look at the numeric keypad at the right hand side of your keyboard and visualize the keys '1' through '9' as defining a square. Since the '7' key is in the upper left hand corner of the square — that's what you'll see on the screen when you press the number seven. Try it now! Note that the '5' key fills in the entire character area and that the '0' key sends a blank to the screen. Try pressing each of the ten numeric keys. When you press a numeric key, the associated graphic character appears at the cursor location and the cursor disappears. Each character you type appears at the current location until you move the cursor. The cursor again becomes visible when it is moved. (The cursor causes it's location to be displayed in inverse video.) Only the last character you entered at the previous cursor location remains there. To erase a character, place the cursor over it and press the '0' key which has been programmed to produce a space.

Take a little time now to practice with KBOARD. Don't try anything too complex, because we will teach you how to erase a screen (and permanently lose the picture) before we teach you how to save it.

The drawing board mode also has several control key commands. Control key commands are produced by holding down the CTRL key when pressing the appropriate letter key. The commands are summarized in Figure 1. For ease in remembering them, notice that the control key letters generally match the first letter of the function performed by the key (i.e., CTRL-U for Underline, CTRL-A for Auto-Repeat). As you can see from Figure 1, control key sequences can be one, two or even three characters in length. The one command not a control key command is ESC. Pressing the ESC key when in the drawing board mode immediately returns you to the menu. Your work is saved in memory and you may return to it from the menu.

Let's take a look at the control key commands. The commands are grouped into three major functional areas. First are the miscellaneous commands which don't fall into any specific category. The second batch of commands are called the toggles — they are used to turn particular functions on or off. The last major command group are the block commands. The block commands cause some action to be performed on any user defined rectangular area of the screen.

MISCELLANEOUS COMMANDS

CTRL-C Command Summary When you're in the drawing board mode, press CTRL-C. A summary of available commands appears as shown in Figure 1. This summary is also available from the main menu. To return to the drawing board mode, press ESC. CTRL-C may be used at any time since it doesn't disturb the data on the screen.

CTRL-N New Screen Command Once you have returned to the drawing board mode, press CTRL-N. The program responds with 'Are you sure you want to clear the screen?' If you want to erase the screen, press Y. Pressing any other key will return you to the picture on your screen. Press Y. Your screen will clear and the cursor will be sent to the upper left corner. This command permanently erases any information which has not been saved.

To guard against accidentally erasing your work, you should regularly save pictures you are working on. We will explain how to do this in a later section.

CTRL-M Mode Display If you're following along with the manual, you have a blank screen with the cursor in the upper left corner. Press CTRL-M and the mode display will fill the screen. The mode display is a summary of all the current settings used in the drawing board mode. The mode display is shown in Figure 2.

The first line in the mode display tells you whether the program is ready to accept ALPHAnumeric or GRAPHIC data and whether the AUTO-REPEAT mode is ON or OFF. All these features will discussed in depth later in this section. Next, the current status of the four video attribute flags (reverse video, flashing, underline and intensity) is displayed.

Below this is the current position of the cursor in x and y coordinates. The x number refers to the 80 possible columns on the screen. The value of x can range from 0 to 79 (with column zero on the left). The y number refers to the 24 possible rows on the screen and can range from 0 to 23 (with row zero at the top). Below the current cursor position are the x and y coordinates for

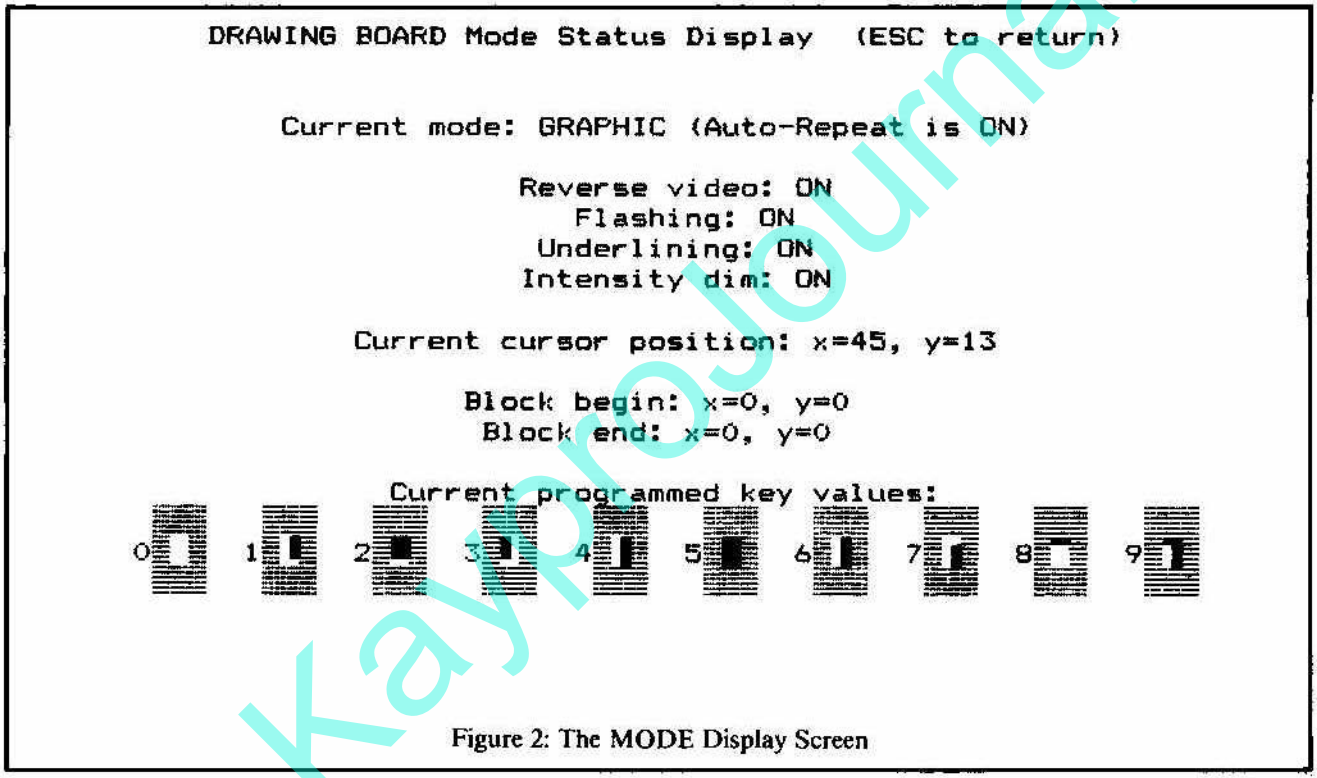


Figure 2: The MODE Display Screen

the current settings of the 'block begin' and 'block end' markers. These markers are used extensively in the drawing board mode and will be discussed in the section on block operations.

Lastly, the ten boxes in the bottom row show the ten graphic symbols currently programmed into the ten numeric keys.

You may call up the mode display at any time during drawing board mode operation — it does not affect the drawing you are creating. To return to the picture, press ESC. The cursor will be returned to the location it was when you left and you may continue with your drawing.

CTRL-P Program Graphic Keys When you type CTRL-P in the drawing board mode you are presented with the Program Graphic Keys display (as shown in Figure 3). This operation allows you to program the ten numeric keys to represent any of the 256 characters now displayed on the screen.

In the upper left hand corner you will see that the first character is surrounded by a dim box. Use the arrow keys to move the box around the screen until it surrounds a character that you would like to program into a numeric key. When you've got the box in the correct location, press the appropriate number key and the graphic character will be assigned to that key. To show this, the box next to the number key at the bottom of the screen will display the programmed character. When you have set up the ten numeric keys with the desired characters, hit ESC to return to the drawing board mode.

You can return and reprogram the keys to different values at any time during the drawing process. Note that alphanumeric characters (the letters and numbers) are treated just like any other graphic characters. In the drawing board mode, the programmed graphic characters are sent to the screen by simply pressing the appropriate numeric key.

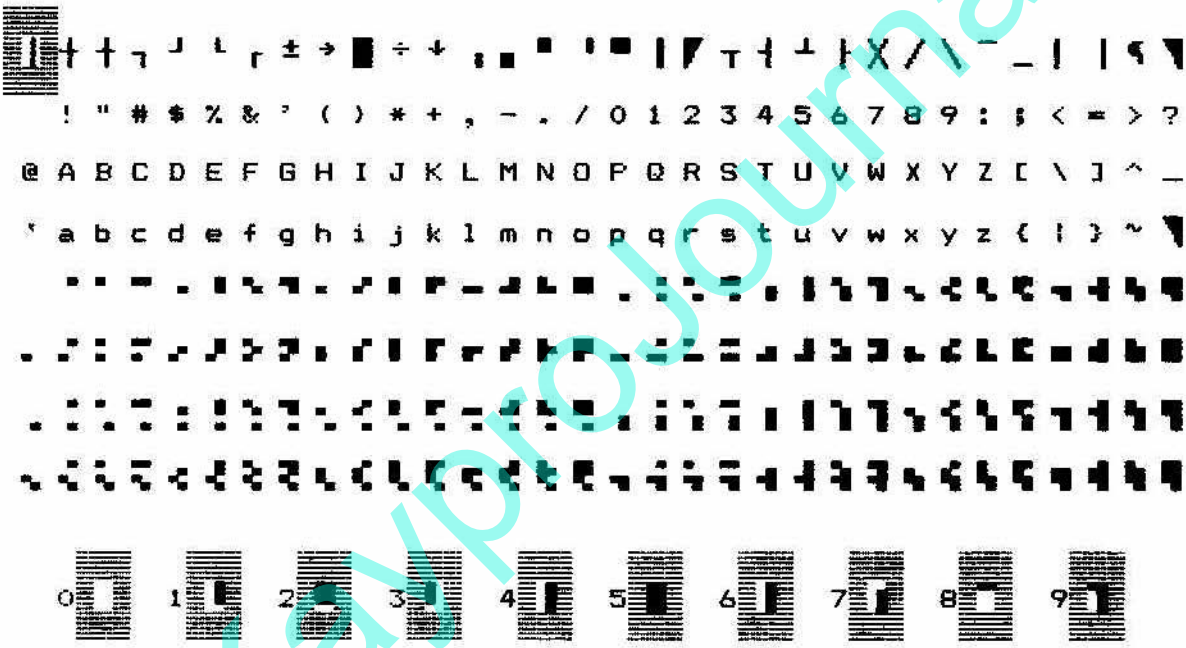


Figure 3: The PROGRAM GRAPHIC KEYS Screen

TOGGLE COMMANDS

All the commands described in this section have one thing in common — they are used to toggle a feature on or off. If the feature is off, then invoking the command will turn it on. If it is already on, the command will turn it off. When KBOARD is first started, all toggles are preset to their OFF conditions. Let's take a look at the six toggle commands.

CTRL-R Reverse Video Toggle This toggle turns the reverse video feature either on or off. When the reverse video toggle is ON, all alpha and graphic characters sent to the screen will be displayed in reverse video — they will appear as black-on-white instead of the normal white-on-black. Try it now. Enter a few characters on screen with the numeric keys. Now toggle the reverse video flag with the CTRL-R command and enter the same characters again.

The reverse video command stays in effect until the next CTRL-R command is received. If you forget the current setting of the flag, you can use the CTRL-M (Mode Display) command to see the status of all toggle flags.

CTRL-F Flashing Character Toggle This toggle turns the flashing character feature either on or off. When the flashing toggle is on, all subsequent characters entered to the screen will flash at a rate of about two times a second.

CTRL-U Underline Character Toggle This toggle determines whether characters entered to the screen will appear underlined or not. All characters, including graphic symbols, may be underlined.

CTRL-I Intensity Character Toggle This toggle turns the dim character video attribute either on or off. When the flag is ON all entered characters will be displayed at half-intensity (dim). When the flag is OFF, all characters will be displayed at full intensity (bright).

CTRL-G Graphic Mode Toggle This command is somewhat different from the toggles previously described. This toggle allows

you to switch data entry from the ALPHA mode to the GRAPHIC mode and back again. To this point, we have examined only the GRAPHIC mode. In the graphic mode, data may be sent only to the screen through use of the ten programmed numeric keys. This is acceptable for the entry of graphic data but it makes the entry of text an unbearable task.

To make the entry of text easier — the ALPHA mode was created. In the ALPHA mode, you can type on the keyboard just like a typewriter and text will appear on the screen as with Wordstar or Perfect Writer. In the ALPHA mode, the numeric keys don't enter graphic data — they do just what you would expect — they cause the associated numeric character to be sent to the screen. When the cursor reaches the end of a line, the next character will cause it to move to the beginning of the next line. The cursor may also be moved with the arrow keys. The text in the ALPHA mode responds to all the attribute toggles (like underline and inverse) just like in the GRAPHIC mode.

The CTRL-G command toggles between the GRAPHIC and ALPHA mode. When KBOARD is first started, the screen is set to the GRAPHIC mode. To find out the current mode setting, just use the CTRL-M (Mode) command.

CTRL-A Auto-Repeat Mode Toggle The Auto-Repeat Toggle is one of the most useful in KBOARD. When this toggle in ON, the last selected graphic character is automatically written in every location visited by the cursor. Try it now! Hit CTRL-A and then press one of the programmed keys. Now move the cursor around the screen and see that it leaves a trail of the selected characters. This is useful for drawing shapes, borders or anything that requires repetitive entry of graphics characters. The current setting of the repeat flag is shown in the Mode (CTRL-M) display.

BLOCK OPERATIONS

The powerful block operations available in KBOARD allow you to easily operate on large areas of the screen with a single command. The function of these operations is discussed in this section.

The block commands consist of two or three character control sequences. All of the commands begin with a CTRL-**B** (for **B**lock). The second letter in the command identifies the block operation requested and it may be entered with or without the CTRL key depressed. For instance the 'Block Copy' command may be entered as either CTRL-B followed by another CTRL-C or as CTRL-B followed by a regular C. In the descriptions that follow, for the sake of readability, the commands will be described using the shorthand notation "^" which stands for CTRL. That is, CTRL-B and ^B are equivalent.

^B^B — Block Begin and ^B^E — Block End Before you do a block operation, you must tell KBOARD which rectangular area of the screen to work on. To define a block, two commands are used —Block Begin and Block End. Any rectangular area on the screen can be defined by its upper left-hand corner (the Block Beginning) and its lower right-hand corner (the Block End). To define a block in KBOARD, simply move the cursor to the block beginning and enter ^B^B. Then move the cursor to the block end and enter ^B^E.

KBOARD requires that the block beginning must be above and to the left of the block end. If this is not the case when you enter a ^B^B or ^B^E command, the bell will sound and KBOARD will set both the Begin and End markers to the space currently pointed to by the cursor.

The ^B^B and ^B^E commands may be used at any time. They merely set the internal KBOARD block pointers and cause no immediate on-screen operation. To see the current settings of the Block Beginning and Block End markers, use the CTRL-M (Mode) command.

^B^S — Block Show To visually locate the 'current' marked block, enter the ^B^S (Block Show) command. This command causes the entire marked block to switch from reverse to normal video two times and then restore the screen to its original state. This makes it very easy to see your defined block. Use the ^B^B and ^B^E command to select a block area and then locate it with the ^B^S command. It's always a good idea to make sure that your block is actually where you expect it to be before you begin any other block operations.

^B^C — Block Copy This command causes a copy of the block contents to be written at another point on the screen. To use it, first define a block then move the cursor to the point where you would like a copy of the block deposited and press ^B^C. The block will be copied to the new location with its upper left corner at the cursor location. When the copy operation is complete, the block markers are left in their old positions.

^B^D — Block Delete This operation causes the entire marked block area to be erased — it is filled with blanks. This command can be used to selectively erase portions of the screen at any time.

^B^M — Block Move This operation causes the marked block to be picked up and moved to a new location on the screen. This operation is like the block copy operation except that the old block location is erased after the move.

^B^F — Block Fill This powerful command allows the defined block to be filled with the graphic character represented by any of the ten programmed keys. To use this command, define a block and then type ^B^F (for Block Fill) followed by any of the numeric keys. The block will then be filled with the character represented by the depressed numeric key. All current video attribute toggle settings will be in effect.

^B^U — Block Undo As you have seen, the block operations are very powerful — they can change large areas of the screen with just a few keystrokes. Unfortunately, this could prove disasterous if you make a mistake. To correct block mode errors, the ^B^U

command is available. If you make a mistake with a block operation, before doing anything else press ^B^U (for Block Undo) and the effects of the block operation will be reversed. REMEMBER — you must invoke the ^B^U command before you enter any other data or the results will be less than perfect.

Now you have learned all of the commands in the drawing board mode. As an exercise, try the following: Clear the screen and write your name in the middle of the screen. Draw a box around your name in bright characters and another box around that one in dim characters. Finally, make a couple of copies of the box in different locations on the screen. If you got through this, then you're a certified expert in the drawing board operation and ready to press on with the last few menu selections.

SAVE Picture to Disk

You now have a picture in KBOARD that you want to save. If you're in the drawing board mode, press ESC to return to the menu. Select the 'SAVE Picture to Disk' option and press RETURN. KBOARD will ask you for the name of the file to which this picture will be saved. Make sure that you have a blank, formatted diskette in drive B, then type B:NAMEBOX and press RETURN. When you press RETURN following filename entry, KBOARD saves your file to diskette. When it is finished, you return to the menu. At this point, you may proceed with any menu function, including returning to your picture for further work. You now have a file called NAMEBOX on drive B with your picture in it. Once you have saved your pictures, you can safely exit KBOARD. You can edit or examine a picture you have saved by LOADing the saved file.

If the file cannot be opened for any reason (e.g., disk full or write-protected) an appropriate error message is displayed and you are returned to the menu level; your picture is not harmed and you can try the process again with another filename (or even change disks).

If another file with the same name exists on the diskette, you are asked whether the new file should replace the old file. If you press Y (for Yes), the old file is erased, and its contents destroyed and replaced

by the new file. Pressing any other key aborts the SAVE and returns you to the menu where you may retry the SAVE with another filename if you wish.

If during the writing of the file to disk, the disk becomes full, the message "Disk write ERROR. Disk may be FULL" will appear. To continue, press ESC and you will return to the menu. At this point, you may insert a new disk and try the operation again. Since KBOARD performs a disk reset before each write operation, you may change disks at any time (except during the middle of a disk operation) without fear of "BDOS Error: R/O" problems.

During the creation of a complex graphics display, it's a good idea to periodically jump back to the menu and save the current display. If a disasterous error is made (like clearing the screen and erasing your picture), you'll always have a backup copy of your work. REMEMBER — the SAVE function does not alter the current graphics display —so use it often.

The SAVE and LOAD menu selections may also be used to view the directory of any active disk drive. To view a directory, simply hit RETURN at the filename prompt without entering a filename. You will then be prompted for a disk drive letter. To see the directory of drive "A", just hit "A" followed by RETURN and wait a few seconds. The screen will fill with the directory information for the selected drive and current user number. If the directory contains more filenames that will fit on the screen at one time, hitting any key will display another page of entries. When viewing the final page of directory entries, hitting any key will return you to the main menu.

LOAD Picture from Disk

This command loads a previously saved graphics file into the KBOARD memory for further editing. Files can be overlayed on top of each other for ease in building up your creations. Loading a picture in the non-overlay mode erases all work which has not been saved. Make sure that you have saved the picture you are working on before you LOAD new files.

Let's try the LOAD command on one of the sample files supplied with the package. After you have saved your previous work, select 'LOAD Picture from Disk' and press RETURN. Hit <cr> in response to the "Overlay file?" question. When KBOARD asks for a filename, type "KAYPRO" and press RETURN. This retrieves the self-portrait of a Kaypro computer that was previously stored on diskette. If KBOARD encounters problems during this process (if it can't find the file, for example), an error message displays and you are returned to the menu. An error that often occurs during this process is that the file has been stored on a disk drive other than the default drive and no drive specifier (A: or B:) was used. So . . . if you can't find your file on drive A, try the B drive.

If the file is successfully opened, KBOARD checks to see that the file is in KBOARD format. If it is, you will be asked whether this file is an overlay. Answering 'Y' (for YES) to the "Overlay file?" question will cause the LOADed file to be written on top of the file currently in memory. A 'N' (or just <cr>) answer will erase the file in memory before the new file is loaded. Any number of files may be overlayed in this fashion. After the file is read into the machine, you are returned to the menu. To view the file, use the arrow keys to select 'Enter DRAWING BOARD Mode' and press RETURN. If the file is not in KBOARD format, an error message is displayed and you return to the menu.

KBOARD will load files created with KBOARD as well as files created with KGRAPH.

Now that you have loaded the file KAYPRO, enter the drawing board mode to view it. At this point you may examine and alter the picture. When you're finished, hit the ESC key and return to the menu. If you've made changes and you want to save your new version of KAYPRO, select 'SAVE Picture to Disk' and press RETURN. Give this picture a name other than KAYPRO unless you want it to replace the original portrait. Remember — to save the file on the B drive, precede the filename with B:.

As described in the SAVE section above, the LOAD command can also be used to view disk directories.

COMMAND Summary

This is the easiest to use of all menu functions. Select 'COMMAND Summary', press RETURN and you will see a summary of the available KBOARD commands in the drawing board mode. This summary is meant as a refresher and does not contain any of the detail presented in this manual.

Press ESC when the command summary is displayed and you will return to the menu.

Now, you will want to exit the KBOARD.COM program. Select 'EXIT to CP/M' and press RETURN. If all your valuable files have already been saved, answer Y to the 'Do you wish to leave' question and you will exit to CP/M. Answering with any key other than Y will return you to the menu.

Now you know how to use all the commands in the KBOARD program and should be able to create your own electronic masterpieces.

After you've created several pictures, you may want to print some of these creations. We'll see how this is done in a later section of this manual.

KBOARD ERROR MESSAGES

KBOARD checks that you are following CP/M's rules for naming files. If it finds an error, it will display one of the following error messages:

No filename entered — You pressed RETURN without entering a filename. Select the option again and then provide KBOARD with a filename.

Illegal drive specified — You specified a disk drive that was not between A and P. Usually you will want to specify either A: or B: (or C: for Kaypro 10 or 12x users).

Illegal character in filename or **Illegal character in extension** — You used an illegal character (i.e. , : ; [ ] = < > * or ?) in your filename. Select the option again and use a different filename.

Too many characters in filename or **Too many characters in extension** — You used more than eight characters in the filename or more than three characters in the extension. Select the option again and use a different filename.

Other errors: KBOARD will also give you the following warnings:

A file with that name already exists. To overwrite this file, press Y (for Yes), any other key to abort SAVE: — If you have revised a file and want the new version to replace the old version, press Y. If you want to keep the old version, or if you chose the wrong filename, press any other key and the original file will be saved. You can then save the new file under another name.

Sorry, can't open file. Please try again — For some reason, KBOARD cannot find the file you specified. Make sure that the correct diskette is in your Kaypro, and that you have specified the correct drive.

Sorry, file not in KBOARD format — You have specified a file which is not a KBOARD file. Select the option again and use a different filename.

Disk write error. Disk may be full — KBOARD has detected a write error. The most probable error is that the disk is full. Insert another disk and try again.

USING KGRAPH

For the Impatient User

By this time you're probably anxious to see what this software package can do. The following section will take you through a quick demonstration of the capabilities of each program in the KGRAPH component of the REMBRANDT Business Graphics Toolkit.

Each of the four graph generation programs can load two types of files, called FORMAT and DATA files. The FORMAT files contain the information used by the program to generate labels, titles and the general layout of the plot or chart. FORMAT files are used to store information for charts that must be created regularly. The DATA files contain the actual numerical data points that are used to create the graphs. Although not a requirement, it is recommended for ease of usage that you use the file type extensions ".FMT" and ".DAT" for FORMAT and DATA files respectively. Sample FORMAT and DATA files have been provided for each of the main plot generation programs. For instance, the sample FORMAT and DATA files for use with the VBAR bar chart program (called VBAR.COM) are named VBAR.FMT and VBAR.DAT.

To get a quick preview of the capabilities of each of the graphics generation programs, do the steps outlined below. The steps are described using the VBAR.COM program but you should repeat the steps for each of the three remaining programs (HBAR.COM, PIE.COM and XY.COM) by substituting the correct program, FORMAT file, and DATA file names at the appropriate points.

1. Place the correct diskette in the "A" drive. (Kaypro 10 and 12x owners, log onto the correct disk and user area).

2. At the "A>" system prompt, type VBAR<cr> to invoke the vertical bar chart program.

3. After the program loads, a menu will be displayed. Use the up and down arrow keys to select menu item number one, 'Start a New Chart,' and hit RETURN.

4. You will be reminded that this option destroys all previously entered data. Type a Y<cr> (for YES) to continue.

5. You will now be asked if you wish to enter a FORMAT file. Type a Y<cr> (for YES) and enter the name VBAR.FMT<cr> when you are asked to input a filename. The specified FORMAT file will now be read and a message displayed.

6. Next, you will be asked if you wish to enter a DATA file. Type a Y<cr> (for YES) and enter the name VBAR.DAT<cr> when you are asked to input a filename. The specified DATA file will now be read and a message will be displayed. (NOTE: Most DATA files will load quickly. The file XY.DAT, however, takes about twenty seconds to load so be patient — the disk drive will turn on and off several times during the process.)

7. When the DATA file has completed loading, the plot corresponding to the FORMAT and DATA files loaded will be "drawn" and displayed on screen. When you are done viewing the chart, hit the ESCAPE key to return to the data entry mode.

8. Hit the ESCAPE key again to quit and return to the menu.

9. Select the menu option, 'Exit to CP/M,' and answer Y<cr> (for YES) to the "Are you sure you wish to leave?" question. You will be returned to the system "A>" prompt.

Now repeat the above procedure for the other three plot generation files (HBAR.COM, PIE.COM and XY.COM).

In later sections of this document you will learn how easy it is to create graphs and plots like you've just viewed. But first, a little background information.

COMMON INFORMATION

The four graph generation programs, VBAR.COM, HBAR.COM, XY.COM and PIE.COM, have been designed with many common commands and usage sequences. Since only one set of commands need be learned it is easier for the novice user to get "up to speed." In this section we will examine these common elements in detail and in following sections we will look at the areas that are unique to each program.

The MENU

The first and most obvious common element between the programs is the main menu. These identical top level menus in each program offer the user a choice of seven options. Each of these options produces the same general results regardless of which program you are using. These options are:

Start a New Chart
Return to Current Chart
Save CHART to Disk
Save FORMAT to Disk
Save DATA to Disk
Disk DIRECTORY
Exit to CP/M

To make a menu selection, use the up/down arrow keys to highlight the desired option and then press RETURN. You may change your selection with the arrow keys any time before you hit <cr>.

All Yes/No questions in the KGRAPH package accept a single character input followed by a <cr>. Entering a Y or y followed by a <cr> signifies a "YES" answer, while entering any other key followed by a <cr> (or even a <cr> alone) is equivalent to a "NO". You may change your selection at any time before the <cr> is depressed. To

change your selection, backspace and enter a new value or merely depress the new entry.

Let's take a look at what each menu selection does.

START A NEW CHART

When this item is selected, you will be reminded that this operation destroys all previously entered data. If you wish to continue with the operation, answer Y<cr> (for YES) at the computer prompt, and the operation will proceed. Depression of any other key followed by <cr> will abort the operation and return control to the menu.

If the operation continues, all the system variables will be set to their initial (or "zero") states and you will then be asked if you wish to load a FORMAT file. If you answer Y<cr> (for YES) to this question you will be prompted for the name of the file to be loaded. At this point, simply type in the file name (use a preceding disk identifier like A: or B: if appropriate) and hit <cr>. If the file is found, the program will attempt to load it. If the program cannot find the named file, an error message to that effect will be displayed and control will return to the menu. If the FORMAT file is found, but an error occurs during the load or the data is not as expected, an error message will be displayed and control will return to the menu.

Following the FORMAT file operations, you will be asked if you now wish to load a DATA file. Answer Y<cr> (for YES) and you will asked to enter a DATA filename. If a valid DATA filename is entered, the file will be loaded and if a FORMAT file has been previously loaded, the data will be used to "draw" the desired graph on the screen. The complete finished chart will be 80 columns wide. When you are done viewing the file, press the ESCAPE key to return to the DATA ENTRY MODE.

If only a DATA file is loaded (and not a FORMAT file), the chart will not immediately be drawn and you will be placed into the DATA ENTRY MODE for entry of the FORMAT parameters before viewing the chart.

RETURN TO CURRENT CHART

This menu item works exactly like 'Start a New Chart' except that the system variables are not reset to their initial values before entering the DATA ENTRY MODE. This command is used when you wish to return to the DATA ENTRY MODE to enter new data points or to edit data previously entered into the system. If no data has been previously entered, you will be asked again if you wish to enter FORMAT or DATA files. If data of any type has been previously entered you will be placed directly into the DATA ENTRY MODE. In short, the main difference between the first two menu selections is that in the second selection the current data is not erased before you are sent to the DATA ENTRY MODE. The details of the DATA ENTRY MODE will be discussed in a later section.

SAVE CHART TO DISK

If data has been entered and a chart has been displayed, selection of this menu item will save the graphic representation of the current chart to disk for later printing (or editing with the KBOARD package). If no data has been entered, a message to that effect will be displayed and control will return to the main menu. If data has been entered, but the chart has never been displayed on screen, you will be asked to first view the chart with the DATA ENTRY MODE (V)iew command before trying to save it to disk. To (V)iew the file at this point, use the 'Return to Current Chart' option to enter the DATA ENTRY MODE and type V to (V)iew the file. When the chart is completed, use the ESC key to return to the DATA ENTRY MODE and hit ESC again to quit and return to the menu. Now, this menu option will allow the chart to be saved. If a chart has not been viewed on the screen via the (V)iew command, it is not in the correct format for the disk save operation. If this restriction has been satisfied you will be asked for a filename under which to save the display. Enter the desired name (with a preceding A: or B: if desired) and press <cr>. The program will first check the disk for files with the same name. If a file with the same name exists, you will be asked whether the file should be overwritten by the new display. Answering Y<cr> (for YES) will cause the old file to be overwritten (which destroys its contents). Any other response will return control to the menu. If no matching file names

are found, the "save" will occur normally, after which you will return again to the menu. When writing CHART, FORMAT and DATA files to the disk, the remaining disk space is monitored. If disk space is exhausted before the file has been completely written to disk, an error message will be displayed. To clear this error condition, you must press ESC and you will be returned to the menu. At this point you may use the directory command to examine free space remaining or you may change disks and try the operation again. Because a disk reset is generated before each write operation, you may insert new disks at any time (except in the middle of a disk operation) without fear of "BDOS Error: R/O" errors.

During the various "SAVE" operations all filenames entered are checked for legality. If you enter a filename that is not acceptable an error message will be printed and you may try again. These error messages are summarized in the KBOARD section of this manual.

SAVE FORMAT TO DISK
SAVE DATA TO DISK

These two items are similar to 'Save CHART to Disk' except that they save the format and numerical data information used by the program, while item three saves the graphic "snapshot" of the completed chart. The same restriction requiring the chart to be (V)iewed before saving applies to both of these menu selections. The saved FORMAT and DATA files can be reloaded at any time to allow the re-creation and editing of any chart. The construction of FORMAT and DATA files is discussed in a later section of this document.

DISK DIRECTORY

The user may view the directory of any disk and the free disk space remaining at any time by returning to the menu and selecting the 'Disk Directory' option. You will be prompted for a disk identifier —enter A, B or C as appropriate (either upper or lower case) followed by <cr> and the disk directory will be displayed. If an illegal drive is entered, an error message will be displayed and you will be returned to

the menu. At the top of the display, the disk capacity and the free space remaining will be displayed. If your disk has more directory entries than can be displayed on one page, pressing any key will move to the next page of entries, otherwise pressing any key will return you to the main menu.

EXIT TO CP/M

This selection ends a session with the program. After selecting this option you will be asked to confirm that you do indeed desire to return to CP/M. Answering Y<cr> (for YES) will terminate the program (destroying all entered data) and return you to the CP/M prompt.

The DATA ENTRY MODE

Many commands used in the DATA ENTRY MODE are common to one or more of the graph generation programs. The twelve DATA ENTRY MODE commands and their applicability to the major programs is detailed in Table 1. In this section, the operation of each of these commands will be explored. Performance details specific to a particular program will be examined in later sections.

The DATA ENTRY MODE can be reached either through menu selections one or two. Wherever you are in the DATA ENTRY MODE, some form of instructions will appear on the screen. For instance, when the DATA ENTRY MODE is first entered, the lower portion of the screen displays all the commands possible at that point. Note that for speed of data entry, each of these commands is activated by one keystroke (upper and lower case are equivalent). No <cr> is required — a <cr> alone is a separate command. These twelve commands will be examined in this section.

(A)dd: Data points in the graph generation programs are organized into groups called records. For instance, in the bar chart programs, each bar is represented by a record. If the current chart contains no records, a "No data has been entered!" message will be dis-

Command	XY	PIE	HBAR	VBAR
(A)dd	X	X	X	X
(D)elete	X	X	X	X
(T)itles	X	X	X	X
(L)abels	X			
(S)cale	X		X	X
(C)hange	X	X	X	X
(M)ode		X		
(P)recision	X	X	X	X
(V)iew	X	X	X	X
(B)ackup	X	X	X	X
RTN (Next)	X	X	X	X
ESC (Quit)	X	X	X	X

Table 1: Commands in the DATA ENTRY MODE

played and you will be reminded to use the A command to (A)dd data. To (A)dd a new record to the data base, simply press A and you will be prompted for the required data by the program. If the maximum number of records has been reached, you will be informed and the "Add" will be cancelled. To add more data at this point, another record will have to be deleted.

(D)elete: To (D)elete the record currently displayed on the screen, press D. You will be asked to confirm that you wish to delete the

record by entering Y<cr> (for YES). Any other response will abort the delete function. If no data has been entered, this command will have no effect.

(C)hange: To (C)hange or make corrections or additions to the currently displayed record, press C. The current contents of each item in the record will be displayed and you will be asked for new data. If the current item is OK, just press <cr> and the next item will be displayed. If a change is desired, enter the new data and hit <cr> and the record will be updated. If no data has been entered, this command will have no effect.

(RTN) Next Record: To view the next record (in numerical order) press <cr>. Repeated depressions of <cr> will cause each record of the database to be displayed in sequence. When the last record is reached, the first record will be displayed and the sequence will begin again. If no data has been entered, this command will have no effect.

(B)ackup: To (B)ackup one record in the current database, press B. Repeated depressions of B will cause the entire database to be stepped through in reverse numerical order. If no data has been entered, this command will have no effect.

(P)recision: This command allows you to set the number of decimal places which will be displayed for numerical values shown in your completed charts and graphs. When you hit P, you will be asked to select the desired precision. The acceptable responses are '0' through '8' specifying zero through eight digits following the decimal point or 'E' which tells the program to show all numbers in the exponential mode. The default value for the system precision is '2' since it is commonly used for plotting dollars and cents values. The exponential mode will be automatically selected for any number which will not 'fit' into the chart at the selected precision. The exponential mode (also called scientific notation) expresses a number as a number between 1 and 10 followed by a power of ten. For instance, the number 125 would be represented as 1.2500e02 in exponential format which means 1.25 times ten to the second power (i.e. 100).

(V)iew: To (V)iew the current state of the chart under construction, press V and the chart will be displayed on the screen. When the chart is displayed, to return to the DATA ENTRY MODE, press the ESCape key. (V)iew can be used as often as desired to assess the effect of format and data changes to the chart in progress. The ability to (V)iew the current state of the chart during the data entry process is one of the most useful features of the KGRAPH package. If "illegal" scaling parameters are in effect, the chart will not be displayed and you will be prompted to use the (S)cale command to update the parameters. If no data has been entered, this command will have no effect. When (V)iewing the chart you may add custom labels and text information anywhere on the screen. To enter the (C)ustom label mode, press CTRL-C (i.e. hold down the CTRL key while pressing the 'C' key). When you enter this mode, you will see the cursor in the upper left hand corner of the display. The cursor may then be moved anywhere within the confines of the chart with the arrow keys. Text may be entered onto the screen at the current cursor position at any time by merely 'typing' in the appropriate characters. Text may be erased by writing over it with 'spaces'. To exit the custom label mode and return to the DATA ENTRY MODE, just press ESC at any time. You may return to the chart and add new text later, but if a 'new' chart is required because new data points have been added or some other change has been made to the data or format, all custom labels will have to be re-entered.

(T)itles: This command allows the (T)itles and sub-titles for the chart to be examined and changed, if desired. First, the current title will be displayed and you will be prompted for new data. If the current title is OK, simply press <cr>. If a new title is desired, enter the new title and press <cr>. Following this, a similar sequence of entries will be required for the sub-title data. Sub-titles are not used in the vertical bar chart presentations (VBAR.COM).

(S)cale: The (S)cale command allows the current chart scaling parameters to be reviewed and changed if desired. Autoscaling may be selected by answering Y<cr> (for YES) to the autoscaling prompt. If autoscaling is not selected, you will be shown the current settings of your scale parameters which you may change if desired. The (S)cale command is not available in the PIE.COM

program. Charts displayed from FORMAT and DATA file input are automatically displayed first in the autoscale mode and may be changed via this command.

(L)abels: This command is available only in the XY.COM program and it is used to define (L)abels for the x (horizontal) and y (vertical) axis of the plot. The current labels are displayed and may be changed if desired.

(M)ode Select: This command is available only in the PIE.COM (pie chart) program. The "standard" pie chart created by the PIE.COM program is scaled so that it will appear round when printed by the printer routines. On-screen, however, the standard pie chart will appear a bit "squashed." If you are creating the chart for viewing on the computer screen, use the mode command to select the ON-SCREEN mode and then (V)iew the file to have it reconstructed for the screen. You may create a chart in one mode, return to the menu and save it, and then return to the chart and change modes as often as desired.

(ESC)ape: Pressing the ESCape key will cause control to return to the main menu without loss of any data. This means that you may return to the DATA ENTRY MODE via menu selection two at any time and your data will still be intact. Remember, if you select menu item one, all data is reset to zero. ESC returns you only to the main menu and not all the way back to CP/M.

Lastly, the method of data entry is common to all of the programs. Any time numeric data is to be entered, free-form data entry is permitted. Numbers can be entered in standard format or in exponential (powers of 10) format. In the exponential format, powers of ten are represented as digits following an "E" or "e". For instance, the following are all equivalent representations of the same number:

150.25 1.52025e2 15.025E1 +15025e-2 .0150215e4

Numeric data may be entered in the range of zero to plus or minus 1E100 (ten to the one-hundredth power). NOTE: when very large numbers or small numbers are entered into the programs, the scaling and format conversion routines may take a bit longer than normal to execute.

When numeric or text data is requested by the programs, the maximum allowable length for the data will be marked on the screen by dim colons. You may enter data longer than the marked area but the program will truncate the data to the desired length. For instance, most "titles" are limited to 40 characters in length. If you enter a 50 character title, the program will only use the first 40 characters.

When the programs ask for a filename to be input, you may precede the filename with an optional disk drive identifier (i.e. A: or B:) to tell the program on which drive the file resides. Standard CP/M filename conventions apply.

DETAILED USAGE INSTRUCTIONS

In this section we will describe in general the usage of the four graph generation programs. This information, with the common information described in the preceding section, forms the complete operational instructions for each program. In the section that follows a step-by-step example of the chart generation process will be detailed using the vertical bar chart program, VBAR.COM.

For each program we will present:

Summary: A brief summary of the type of output that the program produces, illustrated by a sample chart.

Data: The input data required by the program will be described along with any limitations or suggestions for better presentation.

Scaling: This section will detail the scaling options for the charts as well as explaining the exact autoscaling method used by the program.

Restrictions: This section will detail any operational or other restrictions which apply to the program.

Data/Format Files: This section will explain which chart variables are assigned to the DATA file and which are assigned to the FORMAT file. The detailed instructions for constructing the actual files are described in a later section.

VERTICAL BAR CHART PROGRAM (VBAR.COM)

Summary: This program draws a vertical format bar chart based on hand-entered or file input data. The user has complete control over the location and color (high or low intensity) of each bar. The maximum and minimum extent of the vertical scale are displayed directly under the title. Figure 4 shows a typical vertical bar chart as created by VBAR using the supplied sample FORMAT and DATA files, VBAR.FMT and VBAR.DAT.

Data: The vertical bar chart program allows the following pieces of data to be entered:

TITLE: 40 characters maximum. The title appears underlined and centered over the bar chart area. Because of space limitations, no sub-title is available in this program.

MAXIMUM: This is the maximum data value to be displayed on the y axis (if autoscaling is not enabled).

MINIMUM: This is the minimum data value to be displayed on the y axis (if autoscaling is not enabled).

DATA POINTS: Up to 24 data points may be entered. Each data point consists of five separate pieces of information. LABEL: A label for each bar of up to 15 characters maximum. INTENSITY: Determines the intensity of the displayed bar (B for BRIGHT, D for DIM). WIDTH: Width of the displayed bar from 1 to 10 spaces in width. For clarity of display, the displayed WIDTH is one-half character width less than the value specified. A specified WIDTH of three results in a displayed width of two and one-half. LOCATION: This value determines where in the final layout the bar will be located. Location may vary from 1 to 50. A "1" means that the bar will start in the first (leftmost) column of the bar

A	January	1981	4684.00
B		1982	9746.00
C	February	1981	1236.00
D		1982	8264.00
E	March	1981	-3589.00
F		1982	-5634.00
G	April	1981	-8325.00
H		1982	-4521.00
I	May	1981	-1956.00
J		1982	-1237.00
K	June	1981	5556.00
L		1982	4697.00
M	July	1981	7931.00
N		1982	4933.00
O	August	1981	3646.00
P		1982	7923.00
Q	September	1981	1647.00
R		1982	5673.00
S	October	1981	4211.00
T		1982	1647.00
U	November	1981	9776.00
V		1982	6546.00
W	December	1981	2222.00
X		1982	4667.00

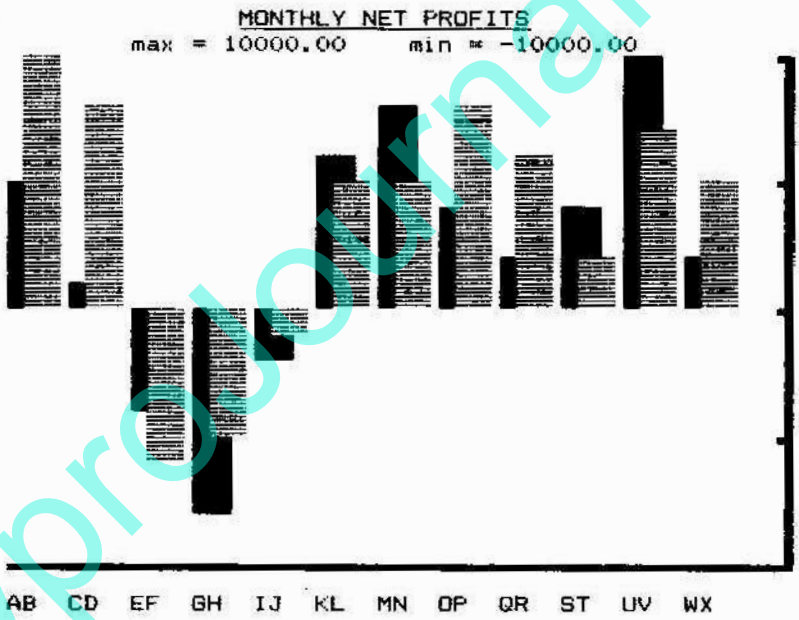


Figure 4: Sample Vertical Bar Chart

chart and a "50" refers to the last (rightmost) column. VALUE: This is the numerical value to be represented by the height of the bar.

Scaling: A simple autoscale routine is implemented. If autoscaling is "ON", the bottom of the vertical scale is set to zero and the top of the scale is set to the maximum value of the input data points. If all data points are positive (negative), the minimum (maximum) scale value is set to zero. If autoscaling is disabled, values for MINIMUM and MAXIMUM may be manually entered to reformat the chart.

Restrictions: The scale maximum value must be greater than the scale minimum or a scaling error will result when an attempt is made to (V)iew the file. If this occurs, use the (S)cale command in the DATA ENTRY MODE to enter "legal" scaling values. The WIDTH variable is limited to values of between 1 and 10. If a WIDTH of less than 1 is entered, WIDTH will be set to 1. If a WIDTH of greater than 10 is entered, a value of 10 will be assigned to WIDTH. Similarly, LOCATION is limited to values between 1 and 50. Values outside of these limits will be result in LOCATION being set to either 1 or 50. If a LOCATION has been selected that does not allow enough room for the desired WIDTH, the bar will be truncated at the rightmost edge of the chart. If two or more bars are assigned to the same LOCATION, only the one with the lowest record number will be displayed. If the LOCATIONs and WIDTHs of two charts cause an overlap of bars, the rightmost bar will be "drawn" on top of the other bar. This overlap feature can be selectively used to create attractive displays. (See the examples provided.)

Data/Format Files: The following variables are assigned to the FORMAT file: TITLE and for each data point — LABEL, INTENSITY, WIDTH and LOCATION. The DATA file contains one VALUE for each data point.

HORIZONTAL BAR CHART PROGRAM (HBAR.COM)

Summary: This program draws a horizontal format bar chart based on hand-entered or file input data. The user has complete control over the location and color (high or low intensity) of each bar. Figure 5 shows a typical horizontal bar chart generated using the supplied sample FORMAT and DATA files, HBAR.FMT and HBAR.DAT.

Data: The horizontal bar chart program allows the following pieces of data to be entered:

TITLE: 40 characters maximum. The title appears underlined and centered over the bar chart area.

SUB-TITLE: 40 characters maximum. The sub-title appears centered beneath the title on the completed chart.

MAXIMUM: This is the maximum data value to be displayed on the x axis (if autoscaling is not enabled).

MINIMUM: This is the minimum data value to be displayed on the x axis (if autoscaling is not enabled).

DATA POINTS: Up to 20 data points may be entered. Each data point consists of five separate pieces of information. LABEL: A label for each bar of up to 15 characters maximum. INTENSITY: Determines the intensity of the displayed bar (B for BRIGHT, D for DIM). WIDTH: Width of the displayed bar from 1 to 10 spaces in width. For clarity of display, the displayed WIDTH is one-half character height less than specified. A specified WIDTH of three results in a displayed WIDTH of two and one-half. LOCATION: This value determines where in the final layout the bar will be located. Location may vary from 1 to 20. A "1" means that the bar will start in the top row of the bar chart and a "20" refers to the bottom row. VALUE: This is the numerical value to be represented by the bar.

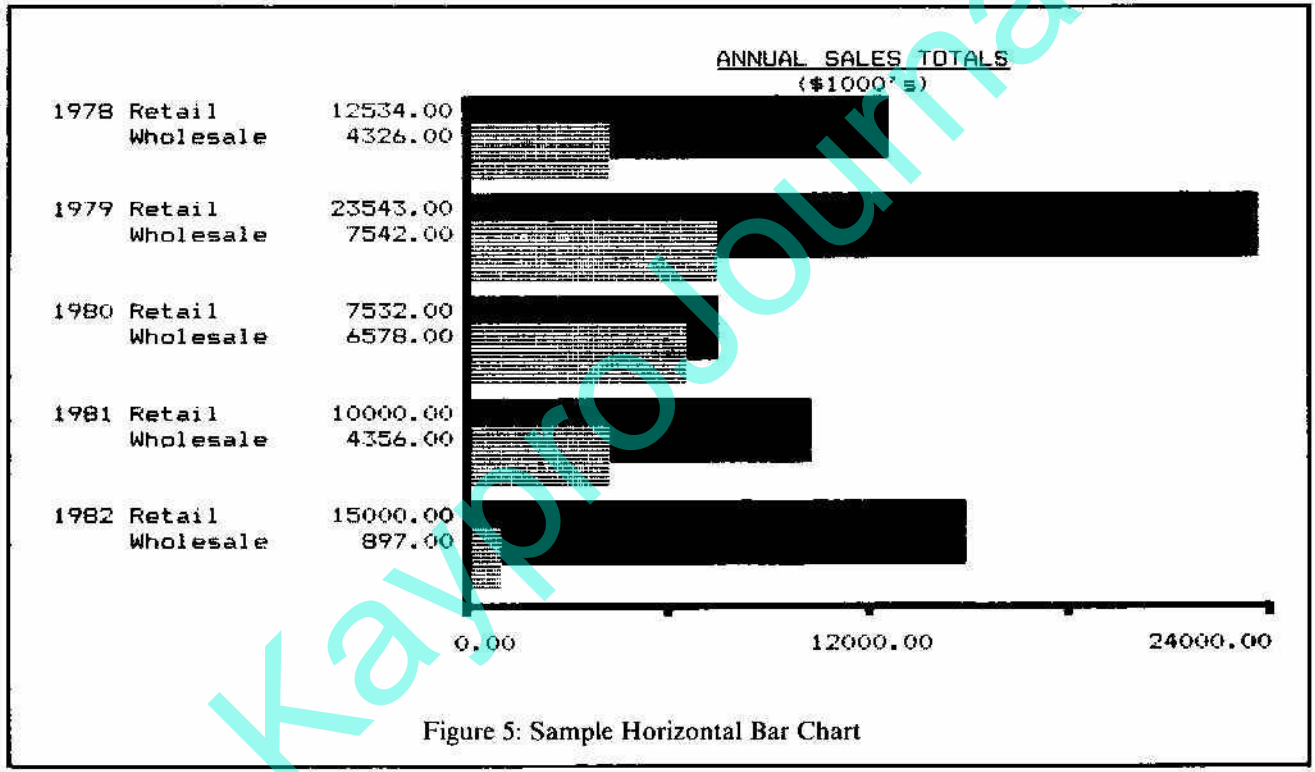


Figure 5: Sample Horizontal Bar Chart

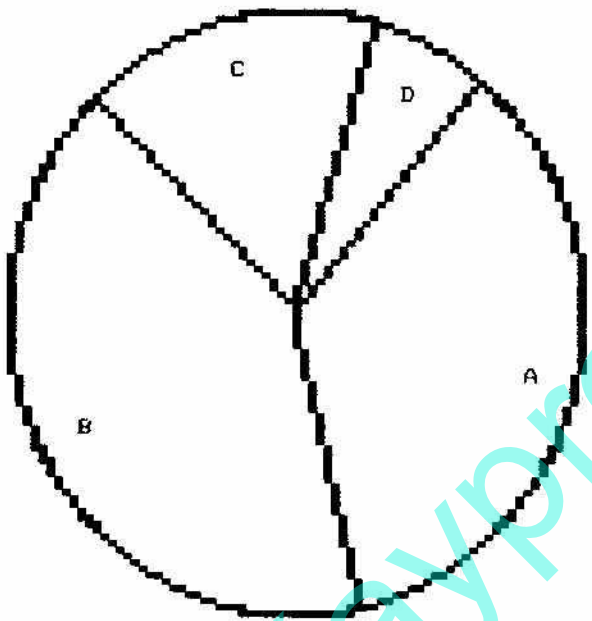
Scaling: A simple autoscale routine is implemented. If autoscaling is "ON", the left end of the horizontal scale is set to zero and the right hand end of the scale is set to the maximum value of the input data points. If all data points are positive (negative), then the minimum (maximum) scale value is set to zero. If autoscaling is disabled, values for MINIMUM and MAXIMUM may be manually entered to reformat the chart.

Restrictions: The scale maximum must be greater than the minimum scale value or a scale error will result when an attempt is made to (V)iew the file. If this occurs, use the (S)cale command in the DATA ENTRY MODE to enter "legal" scale values. The WIDTH variable is limited to values of between 1 and 10. If a WIDTH of less than 1 is entered, WIDTH will be set to 1. If a WIDTH of greater than 10 is entered, a value of 10 will be assigned to WIDTH. Similarly, LOCATION is limited to values between 1 and 24. Values outside of these limits will be result in LOCATION being set to either 1 or 20. If a LOCATION has been selected that does not allow enough room for the desired WIDTH, the bar will be truncated at the bottom edge of the chart. If two or more bars are assigned to the same LOCATION, only the one with the lowest record number will be displayed. If the LOCATIONs and WIDTHs of two charts cause an overlap of bars, the lowermost bar will be "drawn" on top of the other bar. This overlap feature can be selectively used to create attractive displays.

Data/Format Files: The following variables are assigned to the FORMAT file: TITLE, SUB-TITLE and for each data point — LABEL, INTENSITY, WIDTH and LOCATION. The DATA file contains one VALUE for each data point.

PIE CHART PROGRAM (PIE.COM)

Summary: This program creates a pie chart from hand-entered or file input data. The pie chart slices are labeled with letters with a table on the right side of the page that identifies each slice by its label, numerical value, and percentage of the pie. Figure 6 is an example of a completed pie chart created by using the supplied sample FORMAT and DATA files, PIE.FMT and PIE.DAT.



Quarterly Sales Summary
for 1982

	LABEL	VALUE	%
A	First Quarter	6589258.00	35.45
B	Second Quarter	7643000.00	41.12
C	Third Quarter	3125689.00	16.82
D	Fourth Quarter	1226980.00	6.60

Figure 6: Sample Pie Chart

Data: The pie chart program allows the following items of data to be entered:

TITLE: 40 characters maximum. The title appears underlined and centered over the list of data.

SUB-TITLE: 40 characters maximum. The sub-title appears centered beneath the TITLE.

DATA POINTS: Up to 20 separate data points (slices) are allowed. Each data point consists of a LABEL (20 characters maximum) and a numerical VALUE.

Scaling: No user modifiable autoscaling is implemented and therefore no (S)cale command is available.

Restrictions: All VALUEs must be greater than zero. Negative VALUEs will be replaced by their absolute value. Because of the limited graphic resolution of the screen, all slices of the pie that represent less than 5 percent of the total will be lumped together in one slice. The separate values and labels, however, are still listed in the data table. Trying to (V)iew a file whose data consists of all zeros will result in an error message prompting you to re-enter or correct your data.

Data/Format Files: The following variables are placed in the FORMAT file: TITLE, SUB-TITLE and one LABEL for each slice. The DATA file contains one VALUE for each slice of the pie.

XY PLOTTING PROGRAM (XY.COM)

Summary: This program produces a scatter graph from hand-entered or file input data. It draws x (horizontal) and y (vertical) axes, labels the axes, scales them and plots up to 200 points in the appropriate positions on the axes. The actual plotted data is printed in the "dim" mode for added contrast. See Figure 7 for an example of an xy plot created using the supplied sample FORMAT and DATA files, XY.FMT and XY.DAT.

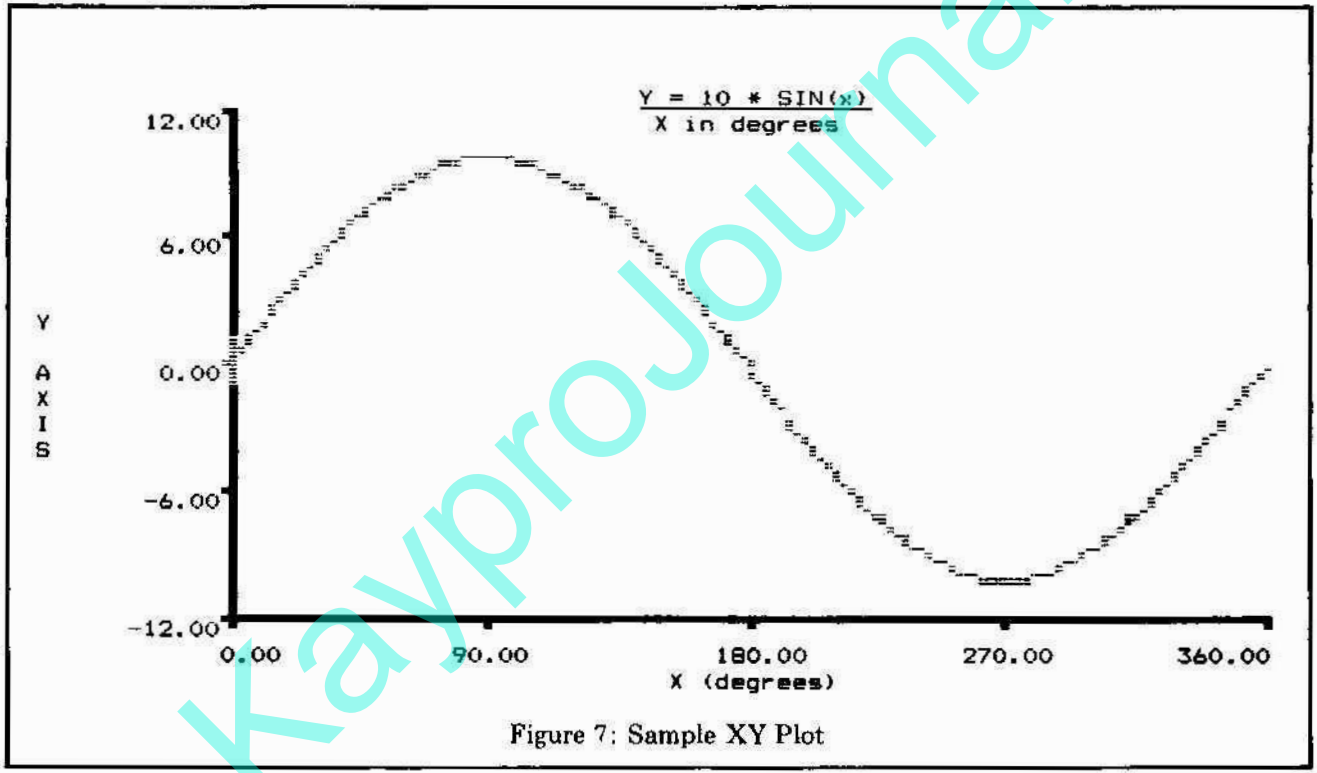


Figure 7: Sample XY Plot

Data: The xy plotting program allows the following data types to be entered:

TITLE: 40 characters maximum. The title will appear underlined and centered above the graph.

SUB-TITLE: 40 characters maximum. The sub-title will appear centered under the TITLE. It is possible for data points to overwrite the sub-title. If this happens in your chart then either change the scaling or remove the sub-title by replacing it with a string of blanks.

X LABEL: 20 characters maximum. This label will appear centered underneath the x (horizontal) axis.

Y LABEL: 20 characters maximum. This label will be printed vertically to the left of the Y axis. Because this label is printed vertically, use of capital letters will make it much easier to read.

X MAXIMUM: This is a numerical entry that will be used to set the maximum data value plotted on the X axis (if autoscaling is not used).

X MINIMUM: This is a numerical entry that will be used to set the minimum data value plotted on the X axis (if autoscaling is not used).

Y MAXIMUM: This is a numerical entry that will be used to set the maximum data value plotted on the Y axis (if autoscaling is not used).

Y MINIMUM: This is a numerical entry that will be used to set the minimum data value on the Y axis (if autoscaling is not used).

DATA POINTS: Up to 200 data point pairs may be entered. Each data point consists of two numerical entries — an X VALUE and a Y VALUE.

Scaling: A simple form of autoscaling has been implemented. If autoscaling is selected, the x and y axis limits are set to match the

maximum and minimum values of the xy data points entered. It is suggested that autoscaling be used for the first look at any chart. Then if a scale change is desired, the (S)cale command can be used to manually change the limits and the new version of the chart may be (V)iewed. The scaling command can be used to "blow up" or enlarge any section of a plot for detailed examination.

Restrictions: If the minimum scale value is greater than or equal to the maximum value on either axis, a scaling error will result when you attempt to (V)iew the file. To correct this, use the (S)cale command in the DATA ENTRY MODE to change the scaling.

Data/Format Files: The following variables are placed in the FORMAT file: TITLE, SUB-TITLE, X LABEL and Y LABEL. The DATA file may contain up to 200 pairs of data points (X VALUE, Y VALUE).

STEP-BY-STEP EXAMPLE

In this section we'll examine the workings of the KGRAPH package by creating a sample vertical bar chart through a step-by-step example. Begin by placing the diskette with the vertical bar chart program, VBAR.COM, on the "A" drive and a blank formatted diskette on the "B" drive.

Let's assume that we wish to graphically represent quarterly sales of a certain product over a two year period. The data we wish to plot is shown below:

Quarter	Unit Sales
1st Quarter '81	12,138
2nd Quarter '81	17,650
3rd Quarter '81	18,256
4th Quarter '81	21,300
1st Quarter '82	14,910
2nd Quarter '82	19,402
3rd Quarter '82	20,120
4th Quarter '82	24,230

Let's begin the graph making process by starting the VBAR program. Type VBAR<cr> at the CP/M A> prompt. When the program has loaded and the menu is displayed, select menu option one, 'Start a New Chart'. Answer Y<cr> (for YES) to the "Do you wish to continue?" question. Since we will be entering all our data and format information by hand, respond to both the FORMAT and DATA questions with a <cr> to signify that no FORMAT or DATA files will be loaded.

Next, the program will ask you to input a title for the chart. Type in "Quarterly Sales (in units)" and press <cr> to enter the title. Now answer Y<cr> (for YES) at the "Autoscaling?" prompt.

The program will be in the DATA ENTRY MODE with a message displayed announcing that no data has been entered. Before we begin to enter data let's get an idea of what we'd like to do. We have eight pieces of data to be plotted and a total width of 50 spaces to work with. Therefore to display our eight bars with no overlap, the maximum width we can assign to each bar is 6 (i.e 50 divided by 8 rounded down to the next lowest integer value). So, a good first try at a chart would be to position the first bar in location one with a width of six spaces, with another six unit wide bar every six locations to the right of the first bar. Let's try it!

Press A to (A)dd our first data point. At the LABEL prompt type "1st Quarter '81<cr>". At the VALUE prompt enter the 1st Quarter unit sales number of 12138 followed by <cr>. Do not enter any commas in the number string. Type a "B" at the INTENSITY prompt to produce a Bright bar. Select a WIDTH of 6 as discussed above and choose a LOCATION of 1 for the first bar. After the LOCATION value has been entered, the record you've just entered will be displayed and again you will be offered several choices. If you've made any mistakes in data entry, press C to (C)hange your data. If everything looks OK so far, we can take a look at our "one-bar" bar graph by pressing the V key to (V)iew the file. Try it now! When you're done looking over the chart press ESC to return to the DATA ENTRY MODE.

Enter the remaining seven data points by pressing "A" to (A)dd each one. Type in the appropriate LABEL and VALUE for each, along with a "B" for INTENSITY and a 6 for WIDTH. For each successive data point add six to the previous LOCATION value. When you've finished, you should have bars stationed at LOCATIONs 1, 7, 13, 19, 25, 31, 37, and 43. Check your work often with the (V)iew command. If everything has gone right up to this point your (V)iewed chart should look like Figure 8.

Let's make a simple change to the chart to further differentiate the bars representing the two years sales. For records 5 through 8 (the '82 quarterly sales) (C)hange the INTENSITY value to D while leaving all other data the same. (V)iew the file again and the rightmost four bars should appear dim, while the left four bars remain bright.

There is another change that can be made easily to make the chart even more useful. By making a few simple changes we can overlay the '82 sales data on top of the '81 data making quarter to quarter sales comparisons easy to do. To do this, change all eight record WIDTHs to 8 and change the LOCATIONs for records one through eight to 1, 13, 25, 37, 4, 16, 28, 40 respectively. Check your progress with the (V)iew command at any time you wish. When you're done, the (V)iew command should show a chart with four sets of overlapped bright and dim bars representing quarterly sales over a two year period.

Lastly, you might want to change the scaling so that the four "tick" marks on the right side vertical scale represent "round" numbers. Use the (S)cale command the set the value of MAXIMUM to 30000 which will result in scale marker values of 0, 7500, 15000, 22500 and 30000. The final chart is shown in Figure 9.

At this point, press ESC to quit and return to the menu. Use menu options 3, 4 and 5 to save the chart itself, its FORMAT and its DATA to the B diskette with the filenames B:SALES, B:SALES.FMT and B:SALES.DAT respectively. The saved file B:SALES can be printed with one of the supplied printer routines after you leave VBAR. The next section explains the operation of the printer routines.

Figure 8: Preliminary SALES Chart

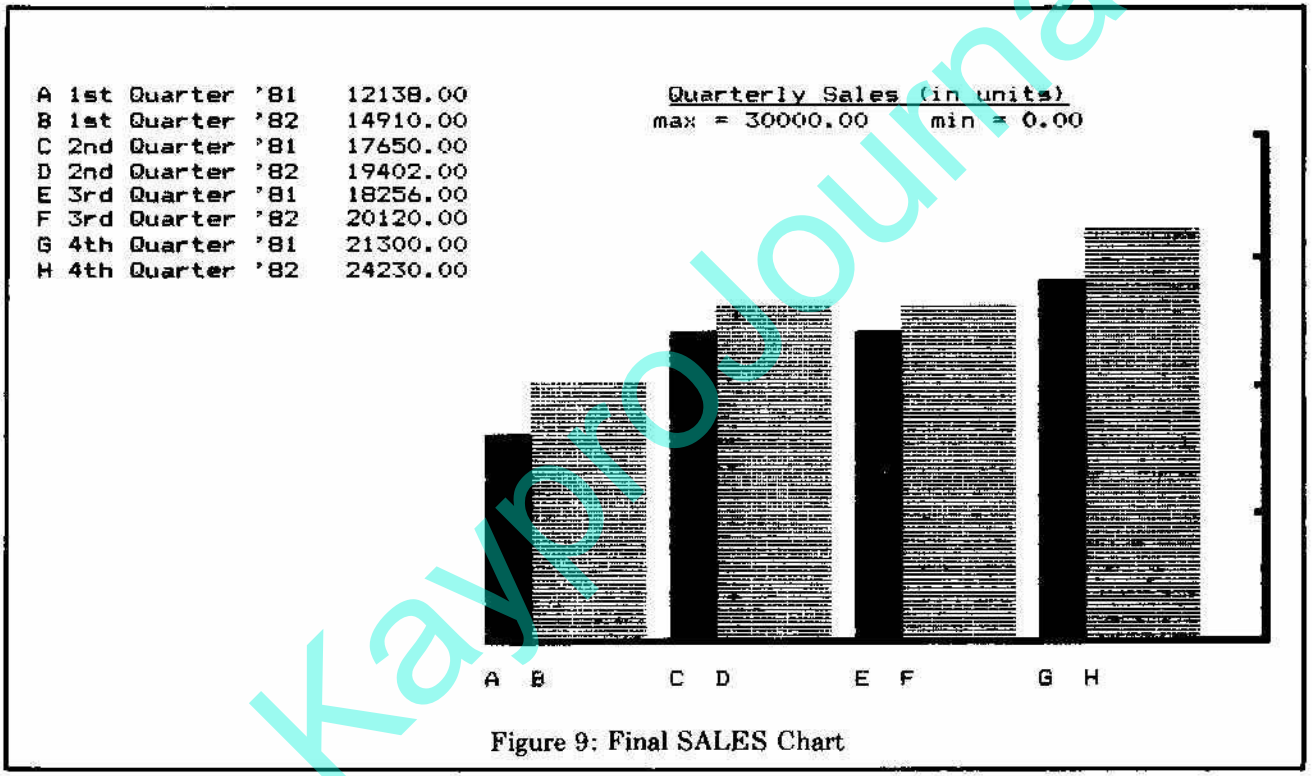


Figure 9: Final SALES Chart

One last note on chart display, the (S)cale command can be used to enlarge an area of interest in any chart. Return to our SALES chart by reloading its FORMAT and DATA files through menu option 1. Hit any key to return to the DATA ENTRY MODE. Next, hit S and enter N<cr> (for NO) at the "Autoscaling?" prompt. Enter 30000 for the MAXIMUM value and 10000 for the MINIMUM. Now (V)iew the chart and note that the program automatically expands this range to completely fill the display and the differences between the bars are even further emphasized.

FORMAT/DATA FILE LAYOUT

If you have charts or graphs that must be put together on a regular basis, then a FORMAT file should be constructed which stores the basic chart or graph layout. Then when the chart is needed, the entire chart format can be loaded by simply loading the FORMAT file. Then data can be entered by hand or by loading a DATA file.

Each of the chart generation programs requires its FORMAT and DATA files to be in a unique layout. In this section, we will describe the required layout for each of the four types of FORMAT and DATA files.

The easiest and most direct way to create a FORMAT file is to generate a graph with the desired format and save the format to disk with Menu Option 4. FORMAT files can also be created by using Perfect Writer or with Wordstar in the "N" (Non-document mode). DATA files can be generated by KGRAPH programs (Menu Option 5) but may also be created with your word processor. Data generated in other programs can be automatically formatted into DATA files by using the techniques described in a later section of this manual.

A general note regarding DATA and FORMAT files is in order at this point. Label and title data should not include commas as the program interprets commas as separators between data.

FORMAT/DATA files for VBAR.COM

FORMAT files for use with VBAR.COM should contain the TITLE data and up to 24 lines of vertical bar format data in the following layout.

```
TITLE   (40 characters maximum)
LABEL, INTENSITY, WIDTH, LOCATION
LABEL, INTENSITY, WIDTH, LOCATION
.
.
.
LABEL, INTENSITY, WIDTH, LOCATION
LABEL, INTENSITY, WIDTH, LOCATION
```

LABEL may have up to 15 characters. INTENSITY is either a B for BRIGHT or a D for DIM. WIDTH is a number in the range from 1 to 10. LOCATION is a number in the range from 1 to 50.

The VBAR DATA files will contain one line for each vertical bar that is to be displayed on the finished chart (to a maximum of 24).

```
VALUE
VALUE
.
.
.
VALUE
VALUE
```

For an actual example, use your word processor to examine VBAR.FMT and VBAR.DAT, the sample vertical bar chart FORMAT and DATA files supplied on the distribution diskette.

FORMAT/DATA files for HBAR.COM

FORMAT files for use with HBAR.COM should contain TITLE data, SUB-TITLE data and up to 20 lines of horizontal bar format data in the following layout:

```
TITLE (40 characters maximum)
SUB-TITLE (40 characters maximum)
LABEL, INTENSITY, WIDTH, LOCATION
LABEL, INTENSITY, WIDTH, LOCATION
.
.
.
LABEL, INTENSITY, WIDTH, LOCATION
LABEL, INTENSITY, WIDTH, LOCATION
```

LABEL may have up to 15 characters. INTENSITY is either a B for BRIGHT or a D for DIM. WIDTH is a number in the range from 1 to 10. LOCATION is a number in the range from 1 to 24.

The HBAR DATA files will contain one line for each horizontal bar that is to be displayed on the finished chart (to a maximum of 20).

```
VALUE
VALUE
.
.
.
VALUE
VALUE
```

For an actual example, use your word processor to examine HBAR.FMT and HBAR.DAT, the sample horizontal bar chart FORMAT and DATA files supplied on the distribution diskette.

FORMAT/DATA files for PIE.COM

FORMAT files for use with PIE.COM should contain the following data. Lines that are not desired should be represented by a blank line.

```
TITLE (40 characters maximum)
SUB-TITLE (40 characters maximum)
LABEL (20 characters maximum)
LABEL (20 characters maximum)
.
.
.
LABEL (20 characters maximum)
LABEL (20 characters maximum)
```

Up to 20 LABELs are allowed in the FORMAT file. If more are included they will be ignored.

The DATA file contains one value for each slice of the pie desired (to a maximum of 20):

```
VALUE
VALUE
.
.
.
VALUE
VALUE
```

For an actual example, use your word processor to examine PIE.FMT and PIE.DAT, the sample pie chart FORMAT and DATA files supplied on the distribution diskette.

FORMAT/DATA files for XY.COM

FORMAT files for use with the XY.COM program should contain the following four lines of information. Lines that are not desired should be represented by a blank line.

TITLE (40 characters maximum)
SUB-TITLE (40 characters maximum)
X LABEL (40 characters maximum)
Y LABEL (20 characters maximum)

DATA files for use with XY.COM consist of up to 200 lines each consisting of the X VALUE and Y VALUE separated by a single comma, as below:

X VALUE, Y VALUE
X VALUE, Y VALUE
X VALUE, Y VALUE
.
.
.
X VALUE, Y VALUE
X VALUE, Y VALUE

For an actual example, use your word processor to examine XY.FMT and XY.DAT, the sample XY plot FORMAT and DATA files supplied on the distribution diskette.

USING DATA FROM OTHER PROGRAMS

The DATA file formats described in the previous section were designed to allow data from other programs to be easily entered into the plot generation programs. Almost any program capable of outputting numerical data in ASCII form can be used to create DATA files for use with the KGRAPH package. The paragraphs that follow describe some general techniques that can be used to create DATA

files from BASIC and dBase II produced output. These techniques can be easily adapted to be used with almost any other type of program.

INTERFACING WITH MBASIC

It is a simple matter to add a few lines of code to almost any program written in MBASIC to allow output data to be placed into the DATA file format required by the KGRAPH package. To create the DATA file we must open a sequential file, write the data to the file with a "PRINT #" statement and close the file. As an example, assume that the data you wish to have plotted is contained in an array called A( ). A typical program sequence to do these tasks is shown below:

```
50000 OPEN "O", #1, "B:DATA.DAT"
50010 FOR I = 1 TO 20
50020 PRINT #1, A(I)
50030 NEXT I
50040 CLOSE #1
```

The above code will generate a DATA file called DATA.DAT on the B: disk containing the twenty values contained in the A( ) array. This type of DATA file is suitable for use with VBAR, HBAR and PIE but as we saw in the previous Appendix, the XY program requires each line to contain two values. If a second array, called B( ), contains the second piece of data required for the XY plot, the line below is substituted for line 50020 above, and the resulting output file will be in the format required by the XY.COM program (i.e. two values separated by a comma).

```
50020 PRINT #1, A(I), ",", B(I)
```

Lines of code like those shown above (or their equivalent) can be placed into almost any MBASIC program to automatically generate DATA files for almost any purpose. In addition, the same general techniques shown above can be used to allow MBASIC to create the required FORMAT files as well.

INTERFACING WITH dBase II

dBase II has a built-in feature which allows you to easily generate standard format DATA files with a simple one line command. Assume that dBase is loaded and running and the file containing the data to be plotted is "in use." Further, assume that the variable to be sent to the DATA file is identified in the STRUCTURE by the label "VALUE". To create the DATA file for use with PIE.COM, HBAR.COM or VBAR.COM, enter the following command at the dBase prompt:

```
COPY FIELD VALUE TO B:CHART.DAT DELIMITED
```

This command causes the numeric variable VALUE to be copied into a file called CHART.DAT on the B: disk. The word DELIMITED in the command, forces the output format to be consistent with KGRAPH requirements. All the records in the database will be copied to the DATA file unless a FOR expression is added to the command line (see your dBase manual for details).

To create a DATA file for use with XY.COM, two variables must be directed to the file. If the variables of interest are labeled, X:VALUE and Y:VALUE, the correct command would be:

```
COPY FIELD X:VALUE,Y:VALUE TO B:CHART.DAT
DELIMITED
```

Again, a FOR expression may be used to limit the number of database elements directed to the DATA file.

USING KBRIEF

KBRIEF lets you create on-screen "movies" and briefings using the graphics files you've created with the KBOARD or KGRAPH programs. To get a quick view of what's possible, follow the steps outlined below.

For the Impatient User

To get a quick preview of KBRIEF's capabilities, place your KBRIEF diskette in the "A" drive (or log onto the correct drive and user area on your Kaypro 10 or 12x). At the CP/M prompt, type "KBRIEF DEMO<cr>". After the program loads, a brief sign-on logo will appear for a few seconds and the screen will go blank. Next, the KBOARD compatible files specified in the master file DEMO will be displayed according to their display and time codes. The KBRIEF demo will show you the effect of many of the possible display code options. Following the final frame of the demonstration, the screen will be cleared and the program will return control to CP/M.

To learn how to create your own presentations, move on to the next few sections of this manual.

The KBRIEF Files

The following files on the distribution disk(s) comprise the KBRIEF package:

KBRIEF.COM — This is the main program which runs and controls all on-screen displays.

CHANGE.COM — A program which changes text files into KBOARD format files.

DEMO — A sample KBRIEF "master" file.

LOGO, KAYPRO, FADE, SALES — Sample KBOARD format files called by the KBRIEF master file DEMO.

Detailed Instructions

Using KBRIEF to create and display an electronic slide show is a simple process. In this section you'll first learn how to use KBRIEF to present a sequence of graphics files. Following this, you'll learn how to create master files to control your own "shows."

As we saw in the last section, using KBRIEF is simply a matter of typing the program name, the name of your master file and depressing RETURN. For example, the command:

KBRIEF MASTER <cr>

loads the program, KBRIEF.COM, which in turn reads the file MASTER which you must create using the instructions outlined below. (The master filename may be optionally preceded with a drive identifier, A: or B:, as necessary.) Then KBRIEF processes each line in MASTER, graphically displays the files as requested, and reports any errors encountered.

The key to effective KBRIEF use is the construction of the master file which directs KBRIEF. In the next sections, you'll learn how to create your own master files.

THE MASTER FILE

A typical master file has several text lines each containing three pieces of information — a graphic filename, a display code and a time code. Each line in the master file corresponds to one screen display on your computer. Master files are created by Wordstar in the "N" (or non-document) mode or with Perfect Writer. Master files can be easily debugged by running through them with KBRIEF and observing any error messages displayed. In the subsections that follow, the parameters in a typical master file will be examined.

FILENAME

The first parameter in each line of the master file is the filename of the graphics file to be displayed at each point in the sequence. The entry may be in upper or lower case and may be preceded by an optional disk drive identifier (A: or B:). Any legal CP/M filename may be specified.

In addition to regular filenames, KBRIEF recognizes five special commands in the filename position of a master file line. Three of the special "filenames" — BLACK, WHITE and GRAY, cause KBRIEF to paint the screen totally black, white or gray (half-intensity) respectively. The display and time codes function in the standard fashion with these special "files."

The fourth special filename is "REPEAT" which causes KBRIEF to return to the beginning of the current master file and repeat the sequence of commands from the beginning. REPEAT causes the sequence to continuously run until the machine is stopped by pressing RESET or a CTRL-C command is entered.

The fifth and final special "filename" is "END." Each master file must be terminated with either an END or REPEAT statement. When KBRIEF reaches END, processing of the master file terminates, the screen is cleared and and control returns to CP/M.

DISPLAY CODE

The display code is separated from the filename by a comma on each line in the master file. The display code determines "how" the specified file will be written to the Kaypro screen. There are nine permissible values (1-9) for the display code, each corresponding to a distinct display operation.

Codes one through four are called "wipes." In a wipe, the "new" picture is displayed in a broad wiping action across the "old" picture. Codes one, two, three and four generate top-to-bottom, bottom-to-top, right-to-left and left-to-right wipes respectively.

Codes five and six, "close curtains" and "open curtains," show the "new" picture through an operation that simulates the action of opening and closing theater curtains.

Code seven, the "fade," is one of the most interesting in the KBRIEF repertoire. In the fade, the "new" picture gradually replaces (or dissolves into) the "old" picture in a random fashion that makes one picture appear to fade into the next.

The "spiral" display code (number eight) draws the "new" picture on top of the "old" from the center spiralling rapidly toward the edges of the frame.

The final display code (number nine) is a bit hard to describe on paper, but we'll try. The operation, which we've named "stripes" draws the "new" picture on the screen with a series of 24 horizontal stripes. Twelve of the stripes fill in from left-to-right and the other twelve are interleaved between them and progress from right-to-left.

The best way to appreciate the display options is to try them out by creating your own master files.

TIME CODE

The final parameter in each line of the master file (following the display code and separated from it by a comma) is the time code. The

time code tells KBRIEF how long to display the specified file. Time codes from 0 to 98 result in the corresponding display time in seconds (i.e. time code of 3 results in an approximate display time of three seconds). Note that the delay specified by the time code does not include the time to load and process each file. The load and process time for a typical file is generally about two seconds. This means that the minimum time a file may be on-screen is about two seconds — even with a specified time code of zero. A time code of 99 causes the file to remain displayed until any key is depressed.

Table 2 summarizes the options available for each line in the master files. No extra spaces should be included on lines in the master file.

ERROR MESSAGES

KBRIEF contains several diagnostic routines that catch mistakes in usage and report them to the user as on-screen error messages. The messages generally contain enough information so that the error can be easily corrected by a simple change to the master file or a revised command line entry. In this section, we'll review the possible error messages and the required steps to correct the conditions that caused them.

Note that error messages that relate to errors in the master file also list the line number in the master file on which the error is present.

ERROR #1: Incorrect number of command line arguments

This error is the result of an incorrect entry being made by the user when bringing KBRIEF "on-line." KBRIEF expects only one additional entry — the master filename — to be on the command line following the word KBRIEF. If the master filename is inadvertantly left off or more than one filename is entered — this error will be generated. Re-enter the command to start KBRIEF with one (and only one) filename (i.e. "KBRIEF FILENAME <cr>" and not "KBRIEF <cr>" or "KBRIEF FILE1 FILE2 <cr>").

Each line in the master file is of the following format:

FILENAME,DISPLAY CODE,TIME CODE

FILENAME:
BLACK
WHITE
GRAY
REPEAT
END
or any legal CP/M filename

DISPLAY CODE:
(1) Wipe top-to-bottom
(2) Wipe bottom-to-top
(3) Wipe right-to-left
(4) Wipe left-to-right
(5) Close curtains
(6) Open curtains
(7) Fade
(8) Spiral
(9) Stripes

TIME CODE:
(1-98) Delay in seconds
(99) Wait for any key

TABLE 2: Master File Format

ERROR #2: Sorry, can't open master file: XXXXX

This error is generated when KBRIEF can't find the master file that you specified on the command line. Check your spelling and make sure that the named file is indeed on the disk.

ERROR #3: Illegal display code: XX

The display code on the specified line is not in the correct range (i.e. not between 1 and 9 inclusive). Use Wordstar or Perfect Writer to enter a "legal" code on the specified line in your master file.

ERROR #4: Illegal time code: XX

The time code on the specified line in the master file is not in the correct range (i.e. between 0 and 99). Use Wordstar or Perfect Writer to enter a "legal" time code on the specified line in your master file.

ERROR #5: Can't open graphics file: XXXXX

The graphics file entered on the specified line in the master file could not be found on the specified drive. Check your disk for the named file and correct spelling or disk identifier in your master file with Wordstar or Perfect Writer as required.

ERROR #6: XXXXX not in KBOARD format

The file named on the specified line was found on the disk, but was not a KBOARD format graphics file. Remove the reference to this file or create an appropriate file with KBOARD, KGRAPH or CHANGE for use here.

ERROR #7: Master file not terminated with END

Every master file must be terminated with and END or a REPEAT filename. Use Wordstar or Perfect Writer to add the appropriate statement to the end of your master file.

KBRIEF will abort operation upon finding the first error in each run through a master file. Correct the error noted on the screen and rerun the program. Repeat this process until the program reports no errors. Your master file is now "de-bugged" and ready to run.

STEP-BY-STEP EXAMPLE

In this brief section we'll review the steps required to create a simple master file. The first step in designing a master file is to decide which files you wish to display and in what order. Simply list the filenames (in order of scheduled appearance) on a piece of paper. Note that the same file may appear more than once in the list. Let's assume you wish to display the KBRIEF logo (the file LOGO on your KBRIEF disk) and the Kaypro self-portrait (the file KAYPRO) repeatedly. So far, we have only a list of filenames:

```
LOGO
KAYPRO
```

Next determine how you wish to have the files displayed. Assume that you would like the LOGO file to SPIRAL onto the screen and remain displayed for five seconds. The display code for the SPIRAL action is 8 so the required master file line is:

```
LOGO,8,5
```

Similarly, we next decide that LOGO should "fade" to BLACK followed by the four second appearance of the file KAYPRO through a top-to-bottom wipe. Lastly, KAYPRO should disappear with a "close curtains" maneuver after which the whole process should REPEAT until RESET. Therefore the complete master file should look like:

```
LOGO,8,5
BLACK,7,0
KAYPRO,1,4
BLACK,5,0
REPEAT
```

Use the Wordstar "N" (non-document) mode or Perfect Writer to create the above master file on your KBRIEF working disk (the files KBRIEF.COM, LOGO and KAYPRO should already be on this disk). Give the master file the name TEST. Put the completed disk into the A drive and type the following line:

```
KBRIEF TEST <cr>
```

If you've done a good job of following along, you should see a repeating display just like we planned. If any errors appear, correct them with your word processor and re-try the process.

PREPARING TEXT FILES

A useful utility program, CHANGE.COM, has been included in this package. CHANGE allows files created with Wordstar, Perfect Writer, BASIC programs or just about any kind of text files to be converted into a KBOARD standard format graphic file. Files prepared with CHANGE can then be called up in a master file and displayed with KBRIEF.

The program is menu driven and easy to use. To start it, simply type "CHANGE" followed by RETURN. The program logo will be displayed and you will be asked to enter the name of the text file to be converted. At this point, simply type the name of the file you wish to "change" and press <cr>. You may use a preceding disk identifier (A: or B:) if required. CHANGE will then attempt to find the file you've specified. If the file cannot be found, an error message will be displayed and control will return to CP/M. If the file is found, you will be asked to enter an output filename which will be used to label the graphic file created by CHANGE. Enter a filename followed by <cr>. If a file with the same name already exists, the program will ask if you wish to overwrite (and destroy) the old file. To overwrite the file, press "Y<cr>" (for YES). To abort the CHANGE press any other key and <cr> (or simply <cr> alone).

CHANGE will read the input file, process it and write the output file. Now the newly created file may be displayed with KBRIEF or edited with the KBOARD package.

CHANGE assumes that all tabs encountered in the file are CP/M "standard" tabs (i.e tabs set every eight spaces). If your file was created with the tabs set at another value, simply add the tab spacing to the CHANGE call. For instance, if your file was created with Wordstar in the "D" mode (with tab stops every five spaces), type "CHANGE 5" followed by RETURN and CHANGE will adapt to the new setting. CHANGE accepts tab inputs from 1 to 20.

PRINTING KBOARD FILES

Now you're ready to print a KBOARD or KGRAPH file. The table below lists the four programs which are used to print the files. These programs work with most of the popular dot-matrix and daisy wheel printers.

MXPRINT.COM — Epson MX-80 w/Graftrax or Graftrax-Plus, Epson MX-100 w/Graftrax or Graftrax-Plus, Epson FX-80, Epson FX-100, Epson RX-80, Gemini 10, 10X, 15 and 15X.

NECPRINT.COM — NEC PC-8023A-C, C. Itoh 8510 Prowriter, Apple Dot Matrix Printer, C. Itoh 1550.

OKIPRINT.COM — Okidata Microline 82A or 83A w/OKIGRAPH, Okidata Microline 92 and 93, Pacemark 2350 and 2410.

DIABLO.COM — All Diablo 630 compatible daisy wheel printers including the Kaypro daisy wheel printer, Juki, C. Itoh Starwriter, Transtar 130, Sanyo 5500, Silver Reed 550, Dynax DX-15, Brother HR-15 and Qume Sprint 5.

There are two steps that should be completed before you try to print a file:

1. You should have used the Kaypro supplied CONFIG program to configure your KBOARD diskette to communicate properly with

your printer. This is described briefly in the 'Introduction' section of this manual and in more detail in your Kaypro User's Manual.

2. Your printer should be turned on and properly connected to your Kaypro computer.

Once you've done these things, you're ready to print a file. Let's print the sample file called KAYPRO. Locate your printer in the above table and find the program that works with your printer.

At the CP/M A> prompt, type the name of the printer program, the name of the file to be printed and RETURN. For example, to print out the file called KAYPRO on an Epson MX-80 printer, type:

MXPRINT KAYPRO <cr>

If you wanted to print the file NAMEBOX that you created earlier during the KBOARD example, you would type the following:

MXPRINT B:NAMEBOX <cr>

That's all there is to it! Just type the name of the correct printer program, a space, the name of the file you wish to print (using A: or B:, if necessary) and press RETURN.

SPECIAL NOTE TO OKIDATA PRINTER USERS: The OKIPRINT routine will print KBOARD files on both the Okidata 82/83 and 92/93 series printers. After the program has started, you will be asked whether you are using an 80 or 90 series printer — after you answer the question with the correct response for your printer, the printout will begin.

SPECIAL NOTE TO NEC, C. ITOH PROWRITER and APPLE DOT MATRIX PRINTER USERS: The NECPRINT routine will print KBOARD files on all of the above listed printers. After the program has started, you will be asked whether you are using an Apple Dot Matrix Printer — after you respond with Y or N as appropriate, the printout will begin.

To stop printing, press and hold CTRL-C. The program will stop printing.

The printer output is an accurate reproduction of the KBOARD display. There are, however, several restrictions to the printer routines that were made in the interests of simplification. The restrictions include:

1. The white areas of the display are printed as black on the printer and the black areas are left white. The dim areas are faithfully reproduced as gray on the printed page. These changes were made to speed up the printing and save excessive printer and ribbon wear by not having to 'ink' in the entire background of every display.

2. Inverse video text data will be printed as normal text (i.e. black on white). This restriction is imposed by the resolution of the dot-matrix printers and the total lack of this capability on daisy wheel printers.

3. Flashing characters will be printed in their full ON condition.

When a printer program is invoked, if there are any problems in reading the file (can't locate file, file not in KBOARD format, etc.) an appropriate error message displays and you return to CP/M, where you can try again.

If the filename is accepted and the file is in the correct format, the printing process begins. Depending upon the complexity of your display file, the printout may take from under one minute to over five minutes to complete (even longer on daisy wheel printers).

That's all there is — when the printing is complete, the program returns you to the CP/M command level.

Note that the illustrations in this manual were created using KBOARD and printed with an Epson MX-80 printer with Graftrax-Plus.

THE KBOARD STANDARD FORMAT

Experienced programmers wishing to experiment (and others with insatiable curiosities) may be interested in the internal format used to store graphics files created by DG/Systems programs. If this doesn't sound of interest to you, then feel free to skip this section, because it is not essential to your use of the package.

The graphic file format used by DG/Systems' KBOARD, KGRAPH and KBRIEF software is simple to understand. Each file begins with a four character identification sequence: "[K 1]". Following the ID characters are 1920 data pairs which specify the contents of the screen memory starting at the upper left hand corner and ending at the lower right corner. Each pair consists of two bytes of data. The first byte is the ASCII value of the screen contents. The four lower bits of the second byte contain the flags for the four video attributes (inverse video, flashing, underline and intensity). The layout of the attribute bits is as below:

bit 7: not used
bit 6: not used
bit 5: not used
bit 4: not used
bit 3: underline on
bit 2: blinking on
bit 1: reduced intensity on
bit 0: reverse video on

6.2 The KBOARD Standard Format

This is the same format as used by your Kaypro computer in its video memory.

All data is continuous on the disk file and is not separated by commas or other delimiters.

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