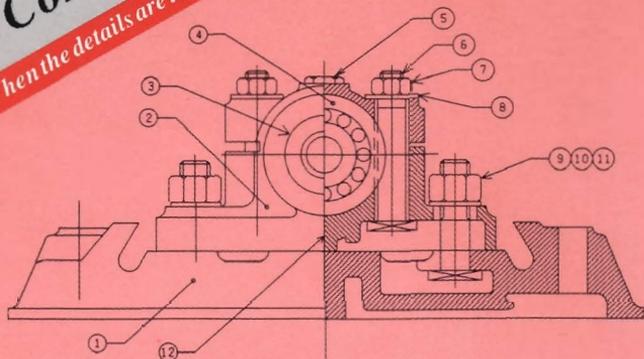


Home Designer

CAD for the Commodore 128

When the details are important!



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THE HOME DESIGNER

DOCUMENT REVISION D

BY
JAMES R. KENDALL

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REVISION STATUS

REV

SHEETS AFFECTED

- A 2.1, 3.3, 3.9, 3.10, 3.11, 3.51, B-2, F-1, F-2, H-3
- B 1.2, 2.1, 3.2, 3.12, 3.13, 3.14, 3.15, 3.30, 3.31, 3.36, 3.37, 3.38, 3.45, 3.46, 3.47, 3.48, 3.50, 3.51, GLOSSARY 2, A-1, B-2, C-4, D-2, F-1, F-2, INDEX 2
- C 1.1 - 1.2, 2.1 - 2.3, Appendix A, Appedices C thru F, Index

Chapter 3 has had every page altered to some extent. Most are very minor consisting of simplified Data Prompts, but upgrading users would do well to look this chapter over.

Added: limited plotter capability
Separated program into modules
Added English Units and Appendix J
Library Figures inserted on active layer
Box figures
Increased printer speed

- D 1.2, 1.3, 2.1, 2.3, 3.1.1, 3.1.12, 3.1.13, 3.1.31, 3.1.48, 3.1.49, 3.1.50, 3.2.1, 3.2.3, 3.2.4, A-1, A-2, C-1, C-2, C-3, F-1, F-3, H-1 THRU H-4, I-1

Added: Disk copy info to Appendix H
Appendix K
Color controls for screen display
High Resolution printer drivers

Removed: Hardware key protection

PRINTER AND INTERFACE COMPATABILITY

The following printers have been successfully tested with this program.

1. CITHO 8510 PROWRITER
2. EPSON RX-80
3. EPSON FX-80
4. STAR SG-10
5. STAR SG-15
6. LEGEND 1080
7. COMMODORE VIC-1525
8. COMMODORE MPS-801
9. SEIKOSHA SP-1000VC
10. OKIDATA-120
11. PANASONIC KX-P1091i

If your printer is not listed, but is graphics compatible with one of the above, particularly the EPSON printers, chances are the program will work with your printer.

The following interfaces have been successfully tested with this program.

1. CARDCO CARD? +G
2. GWIZ
3. MICRO R&D, INC. MW-350
4. XETEC Super Graphix

PLOTTER AND INTERFACE COMPATABILITY

The following plotters have been successfully tested with this program.

1. CBM 1520
2. HEWLETT PACKARD 7470A

If you have access to a properly interfaced Hewlett Packard compatible plotter, chances are the program will work with it.

The only interface tested with this program is the Omnitronix CBM serial to RS232 serial interface. USER port interfaces will not work.

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To Debbie, Doug, and Sam



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Please read "readme" file on disk,
for additional update information.

INTRODUCTION

This program is designed to give the user the ability to create detailed drawings and sketches. There are basically two different types of CAD packages. The first type is based on bit mapped graphics. This means that all data entered into the program is stored in the bit mapped screen display. The accuracy of the final product is therefore, limited to the resolution of your computer's display. The second type, which includes this program, is object oriented. In this type program, the data is stored in the form of individual lines, circles and text strings, not pixels to be turned on and off. The drawing seen on the screen is a representation of this data scaled to whatever view the user has selected. When you magnify or "zoom in on" an area in the first type of program, your display will consist of "fat" dots representing the bit map. In this program, "zooming in" will actually increase the resolution of the area in question.

A good way to visualize an object based drawing is as a special type of database file. The program constructs the drawing on the screen and ultimately on the printer, using the information stored in the database. When you select an object for some manipulation, such as a rotation, the program has to locate the object in the database. This is a considerably more complex task than simply altering pixels on the screen map (so much so that the program switches to fast mode during the search).

This program supports the use of five layers. Each of these layers can be considered an individual drawing that can be overlaid on any or all of the other layers much as transparencies can be overlaid. For example, if house plans were being prepared, the basic layout could be on one layer, the electrical wiring on another, the heating and ventilation on a third. This would allow the user to prepare multiple sheets using the basic outline and excluding the layers not needed.

The drawing size represented by the screen display is 22" wide by 16" high. If the hardcopy device is a standard carriage dot matrix printer, the output can be scaled to half size or 11" by 8". The resolution of the printouts vary from 72 X 60 DPI for Commodore compatible printers to 216 X 240 DPI for Epson or IBM compatible printers.

In addition to your sketches and figures, the program supports the uses of library figures stored on disk. These can be user defined and can be inserted at any angle and scale.

Another useful aspect of the program is the ability to used scaled text. Once a text string has been inserted into the drawing, the size of the text can b redefined to fit conditions. The default size of the text can also be changed. Since text requires a great deal of microprocessor time, it (text) can be "turned off" when not needed.

The following chapters explain the operation and syntax of the program. At this time it is recommended that you read the System Overview, (Chapter 2), and then work through the Tutorial, (Chapter 3).

The Tutorial has been arranged to cover the commands in the same order as the screen menu. This allows you to use the screen menu as a rough index during operation of the program. An effort has been made to have figures in the Tutorial adjacent to the referencing instructions. In the past, I have found it very irritating to read manuals that reference figures several pages away.

APPENDIX H has been provided for the new CBM user. This appendix contains a summary of some BASIC 7.0 DOS commands. In addition, backup instructions are provided for those users who only have the copy utilities provided on the 1571 distribution disk from Commodore.

Any feedback on the use or operation of this program will be greatly appreciated. If you find a repeatable bug, please include such information as the program's response (ie: "lock up") and the series of commands used to generate the error. Other information such as an estimate of the number and type of entities contained in the drawing could be helpful. My mailing address can be found with the copyright notice in this manual. I will provide a free update to the first person documenting a particular bug.

SYSTEM OVERVIEW

Your "HOME DESIGNER" package should include this manual, a program disk, and a function key overlay. The program disk is NOT copy protected and you should copy it and use the copy rather than the original. I have included backup instructions in Appendix H for those users who have only the copy utilities that came with their 1571 disk drive.

To run "HOME DESIGNER" requires a Commodore 128 computer, a disk drive, and a mouse or joystick. I highly recommend the mouse for it's ease of control as compared to the joystick. As a side note, the right button on the 1350 mouse, button "B", is not used by this program (or any other that I know of) due to the hardware configuration, you should also have a blank formatted disk prepared prior to starting (see APPENDIX H). A TV or color monitor can be used as a display, but better results can be had using a monochrome monitor with a 40/80 column setting. On my monitor, a Zennithy ZVM 121, in 40 column setting, the pixels form an almost square matrix without a correction factor (see APPENDIX F).

"HOME DESIGNER" consists of 4 program modules accessed from the main menu. The main program provides the user with the tools to create the drawings. A second module handles output to a dot matrix printer and the third module supports several plotters. The final module is a configuration program which allows the user to specify such things as the type of printer being used, the degree of correction desired for the display, and the allocation of the disk drive(s). A utility called TMERG is included (see APPENDIX K) on the program disk. This utility allows the user to incorporate text files from Paperclip into a drawing.

"HOME DESIGNER" commands consist of a verb describing the operation to be performed. In conjunction with the descriptive verb, many commands use one or more modifiers to further specify the desired operation. Commands and modifiers can be represented by their first three letters. In this manual, commands and modifiers will be shown with the necessary input letters capitalized and in boldface, ie:

INSert LINE

The commands can be broken into three categories; GRAPHICS, INPUT/OUTPUT, and HOUSEKEEPING. These commands are covered in depth in subsequent sections.

GRAPHICS COMMANDS

The graphics commands are utilized to create or modify drawing entities. Drawing entities are discrete drawing components such as individual lines, text strings or circles. The graphic commands are:

- 1) **INSert** used to create drawing entities.
- 2) **TRANs**late used to move drawing entities from one location to another.
- 3) **DELe**te erases drawing entities.
- 4) **RO**Tate rotates drawing entities.
- 5) **TR**Im lengthens or shortens a line.
- 6) **DIV**ide divides a line into 2 sections.
- 7) **MIR**ror creates a mirror image of lines and circles.
- 8) **OFF**set creates indential parallel lines.
- 9) **CH**ange used to modify the parameters, such as text height, of existing entities.
- 10) **VER**ify provides the user with information about an entity such as location, layer, etc.
- 11) **ZOO**m allows the user to magnify, shrink, or shift a view.

INPUT/OUTPUT

Input/output commands allow the user to access the disk drive(s). The I/O commands are:

- 1) **FILE** used to store drawings on disk.
- 2) **LOAD** used to retrieve drawings from disk.
- 3) **DIRectory** allows the user to list files on the disk.
- 4) **EXIT** allows the user to leave the main program and return to the Main Menu.

HOUSEKEEPING

Housekeeping commands provide a means of modifying the screen display, program parameters, and drawing data. They are:

- 1) **SELEct** this command with the proper modifiers, allows you to change program parameters such as text height.
- 2) **INCLude** used to include layers in the display.
- 3) **EXCLude** used to turn off or exclude layers in the display
- 4) **DISPlay** turns off the graphics display to allow viewing of previous commands.
- 5) **RESume** used after **DISPlay** or **LIBRARY** to bring back the graphics display.
- 6) **REPaint** refreshes the graphic display.
- 7) **NEW** used to clear the data base.
- 8) **PACk** used to compress the database.
- 9) **LIBRARY** used to create library figures.
- 10) **STATus** gives the number of entities present on each layer and the memory remaining for text.
- 11) **CHECk** used to remove bad data.

The "HOME DESIGNER" supports a database of 5 layers. Each layer can contain up to a maximum of 400 line entities, 100 circles, and 100 text strings.

DRAWING

Before starting this tutorial, it is recommended the user read the Introduction and System Overview to become familiar with the terms and commands. This program, like any powerful piece of software, requires practice, so don't expect to master it in one sitting. To get started:

1. **TURN THE COMPUTER AND DISK DRIVE OFF:**
2. Make sure the 40/80 display button on your computer is not depressed.
3. Set the monitor for forty columns (only if your monitor has a 40/80 column switch).
4. Plug your mouse (or joystick) into Port #2.
5. Insert the program disk into the disk drive.
6. In this order, turn on your monitor, then your disk drive. If you are planning to use it, turn on your printer. If you are using a 1351 mouse, depress the right mouse button and then last, turn on your computer.

The program will begin loading and display:

BOOTING... HOME DESIGNER

The title screen, with the copyright notice and program version, will appear for a few moments. Next, the main menu will come up offering you 5 choices:

1. EXIT HOME DESIGNER
2. RUN HOME DESIGNER
3. PRINT A DRAWING
4. PLOT A DRAWING
5. CONFIGURE HOME DESIGNER

If this is the first time you have run the program, you should choose selection 5 and follow the instructions in Appendix F. If you have already configured the program, choose selection 2 (the default) to start "HOME DESIGNER".

In this tutorial all letters that must be typed are printed in upper case and boldface, ie; **RUN "HOME DESIGNER"**. Normally, only the first three letters are required. A keypress such as the return key is shown in brackets, ie; [ret]. Program responses such as LOC are printed in upper case. As you type in the commands it is important to leave a space between each word. The exception to this is the colon, :, which terminates the command. When the program sees this character it automatically inserts the space. The syntax for most commands is as follows:

```
COMMAND [MODIFIER(S)] : ENTITY DATA ; COORDINATE DATA
```

Different portions of the command and data sequence are separated by the delimiters colon [:] and semi-colon [;]. The colon tells the program that the command sequence has been completed for those commands that require additional information. (NOTE: For some commands no additional information is required and a [return] is sufficient.) This additional information is given in the data section of the command where the program gives you the prompts ENT or LOC to indicate the type of data required. The ENT prompt indicates that the program needs the user to select entities. Lines, circles, text, and arcs are referred to as entities. Commands like translate, rotate, and mirror require entity selection and also require one or more drawing coordinates. The semi-colon is used to tell the program that the entity selection is completed. The program gives the LOC prompt indicating that drawing coordinates are required. Pressing [ret] after these prompts without entering the appropriate data results in the command being aborted.

After the program has loaded and the menu screen disappears, the work screen comes up and should look like FIGURE 1. At the top left corner of the screen the user will see the word "ACTIVE" and the number "1" This indicates that you are drawing on the first of five possible layers. To the right of the "ACTIVE"

display are the letters "TS" followed by a space and the letter "T". The letter "T" is highlighted when text is enabled. When text is disabled, letters and numbers previously entered on your drawing are not displayed, thereby speeding up the program. Next to the "T" is the word "INC" with the numbers 1 through 5 highlighted. These numbers represent the five layers of the program, with visible layers being highlighted. At the right side of the screen is a menu of Home Designer Commands. At the bottom of the graphics display, you will see a "#" prompt. This is referred to as the command line. The cursor is a flat unblinking line next to the prompt. Your work area is equivalent to a sheet of paper 16" high by 22" long. In terms of X and Y coordinates, X0Y0 is located at the bottom left corner. To clearly mark the boundaries of the work area, a vertical line is visible to the left of the menu with horizontal lines at the top and bottom (of the vertical line) extending to the left side of the screen. The actual location of the vertical line will depend on the scaling factor used in the setup program (see APPENDIX F).

ACTIVE 1 TS T INC 1 2 3 4 5	INSERT
	TRANSLATE
	DELETE
	ZOOM
	ROTATE
	SELECT
	REPAINT
	OFFSET
	TRIM
	DIVIDE
	MIRROR
	VERIFY
	CHANGE
	DISPLAY
	INCLUDE
	EXCLUDE
	PACK
	STATUS
	DIRECTORY
	FILE

_

FIGURE 1

There are three methods of entering commands. They can be manually typed in from the keyboard, accessed from the menu, or entered by pressing the appropriate function key.

To use the menu, place the crosshair, using your mouse (or joystick), over the desired command and press the fire button. (NOTE: Only the left button is used on the mouse.) The selected command will appear on the command line at the bottom of the screen. If the command requires modifiers, such as the **LINE** modifier for the **INSert** command, the appropriate modifiers will be displayed in the menu column after the command is selected. (NOTE: Some modifiers, such as the **TEXT** modifier for **INSert**, are not included since the user will have to access the keyboard to use the command.) The desired modifier can then be selected in the same fashion as the command. After selecting the command (and modifiers if any) an additional press of the firebutton will produce a colon or carriage return as required. (NOTE: The crosshair must be in the menu column for the additional keypress.)

The function keys are pressed to select some of the more common command sequences. The function keys are defined as follows:

F1	INS LIN:	F2	INS ARC
F3	DIRECTORY	F4	STATUS
F5	INS LIN HOR :	F6	INS LIN HOR LEN
F7	INS LIN VER :	F8	INS LIN VER LEN

A function key overlay is included. Should the you wish to change the function keys see APPENDIX G.

Now try moving your crosshair around with your mouse or joystick. If your crosshair moves too fast for you type:

SElect SPEeed 50 [ret]

The crosshair should move a bit slower. By increasing the number you will slow down the crosshair.

INSERT

SYNTAX:

#**INSert** [space] [modifier(s)] [:] DATA

The **INSert** command is used to put lines, text, arcs, circles, boxes, and library figures on the drawing. The command will always have one modifier representing the type of entity. Other modifiers, depending on the entity, provide for such things as scale and size. DATA, for this command, represents the point or points on the drawing necessary to position the entity.

To draw a line as shown in FIGURE 2, type:

INSert LINE :

or press [F1]. A line requires two pieces of data, a starting point and an ending point. After you press the colon, the program will respond with "LOC", (If LOC does not appear, make sure you have pressed the [:] after **LINE**.) asking for the start of the line. There are two ways to enter data. The first is with the keyboard in the form X#Y# where X#Y# represents the x-y coordinates of your line. The second way is to use a mouse or joystick to move the crosshair and then depress the firebutton on the joystick (or the left button on the mouse) at the desired position on the screen. Let's start with the keyboard input.
Type:

X5Y5,

The comma tells the program that both X and Y coordinates are complete. Both X and Y coordinates must be given, as leaving one out will give erratic results. A small "x" (point P1 on FIGURE 2) will now appear on the screen at the starting point of your line.

Now type:

X10Y8, [ret]

This is the coordinate for the end of the line. The comma after the second coordinate is optional. Your line will appear on the screen after the [return] keypress and a new prompt , "#", will appear on the command line.

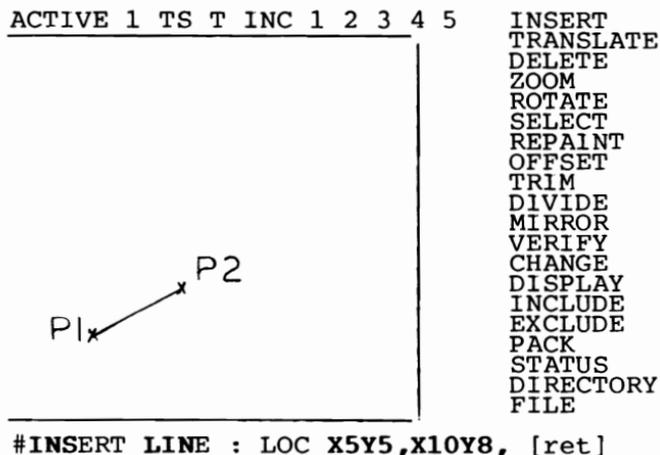


FIGURE 2

Had you not pressed [ret], you could have continued by entering a second pair of coordinates.

To use the menu, place the crosshair over the **INSert** command and press the firebutton to display the appropriate legal modifiers (FIGURE 3). Select the **LINE** modifier (by pressing the fire button a second time). Press the firebutton a third time with the crosshair still in the menu column and a colon will appear on the command line. When the LOC prompt appears, move the crosshair within the drawing area and press the firebutton. A small "x" will appear (point P1 on FIGURE 3) at the center of the crosshair and a "D," will appear on the command line (NOTE: the "D," that appears on the command line is the program's way of acknowledging you have pressed the firebutton). Now move the crosshair to another place within the drawing area and press the firebutton again. Another "x" will appear (point P2 on FIGURE 3) along with another "D," on the command line and a line will appear between the two x's. To exit the command press:

[ret]

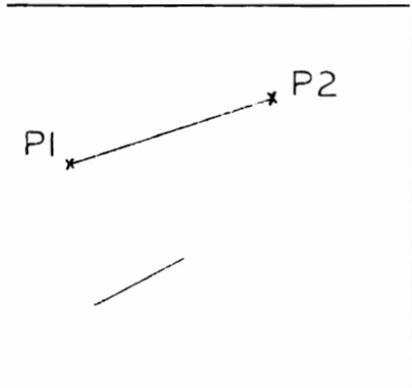
Had you not pressed the [return] key, but instead defined two more points (by pressing the fire button) then a second line would have been created.

Before continuing the discussion of the **INSert** command, a bit of housekeeping is in order. Type:

NEW [ret]

The display will blank momentarily and when it returns your work area will be cleared.

ACTIVE 1 T'S T INC 1 2 3 4 5



LINE
LIN HOR
LIN HOR L
LIN VER
LIN VER L
LIBRARY
CIR RAD
ARC

#INS LIN : LOC D,D, [ret]

FIGURE 3

The **HOR**izontal modifier, when used with **INS**ert **LINE**, allows the user to draw horizontal lines "freehand" with a mouse or joystick (see FIGURE 4). Type:

INSert **LINE** **HOR**izontal:

on the command line, press [F5], or select the command and modifiers from the menu. Again you will see the prompt "LOC". Use your mouse (or joystick) to move the crosshair to the left lower quadrant of the drawing and press the firebutton. A small "x" (Point P1) will appear at the center of the crosshair. Move the crosshair anywhere in the right upper quadrant of the drawing and again press the firebutton (Point P2). Press :

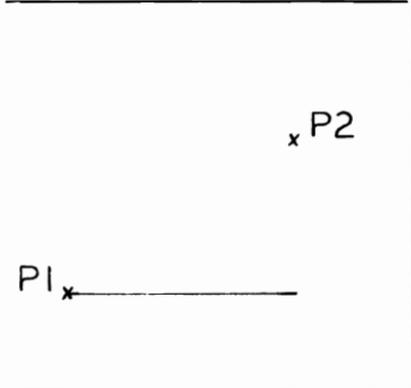
[ret]

Even though you gave it a second Y coordinate greater than the first, you still got a horizontal line. If you do not press [return], but instead continue selecting points, you will make additional horizontal lines. The **VERT**ical modifier works the same way (F7).

The **LEN**gth modifier, (F6 and F8), used to specify an exact line length, will only work with the **HOR**izontal and **VERT**ical modifiers. As before, two coordinates need to be specified, but in this case the second coordinate is used by the program only to determine whether to draw the line to the left or the right of the first point (NOTE: If you are using the **VERT**ical modifier, the second point determines whether to draw the line above or below the first point.) Also, the order is important, ie **INS**ert first, **LINE** second, **HOR**izontal third, and **LEN**gth last (The **LEN**gth modifier is abbreviated "L" in the menu shown in FIGURE 4). Now let's specify a length of 5.3 inches on your drawing. Type :

INS **LIN** **HOR** **LEN**gth 5.3:

ACTIVE 1 TS T INC 1 2 3 4 5



INSERT
TRANSLATE
DELETE
ZOOM
ROTATE
SELECT
REPAINT
OFFSET
TRIM
DIVIDE
MIRROR
VERIFY
CHANGE
DISPLAY
INCLUDE
EXCLUDE
PACK
STATUS
DIRECTORY
FILE

#INSERT LINE HORIZONTAL : LOC D,D, [ret]

FIGURE 4

on the command line, press F6, or select the comand and modifiers from the menu. As in the previous example, digitize (by pressing the fire button) two points near the center of the drawing. A horizontal line will be drawn 5.3 inches long starting at the point of your first "x" and ending in the direction of your second point. (NOTE: The line shown on your display is the equivalent of a 5.3 inch line on your 16" X 22" drawing. The line will not be 5.3" long on your screen.) The **INSert LINE VERTical LENgth** command (F8) functions in a similar manner.

The program also has the ability to work in scaled units, ie 1/4" = 1', which is the default scale (see **SElect SCALE**). The user may enter dimensions in feet and inches with the program making the necessary conversions. At the default scale, 1/4" = 1', a line specified as 4' long will be drawn 1".

The syntax for a typical dimension is:

9'8-3/4"

which translates as nine feet eight and three quarters inches (yes, it does allow fractions of an inch). The feet units may be whole numbers or decimal fractions such as 9.5' to represent 9 feet 6 inches. The dimensions must be typed with no spaces (9' 8-3/4" will yield incorrect results). Inches may also be represented as decimal numbers, ie 9'8.75".

This scaling capability only works with the LENGTH modifier for horizontal and vertical lines, the OFFSET command, and the CIRCLE command. See Appendix J.

Library figures are drawings saved to disk that can be inserted into other drawings. Plumbing fixtures, windows, doors, etc can be stored on disk and reused. This saves redrawing a standard figure each time you use it. A collection of some common figures is on the back of the program disk (See APPENDIX B). Place the disk with the library figures in the drive (If you are using the original disk, turn it over so that the program side is down). Now, to continue, we will **INS**ert a water closet stored on your program disk.
Type:

INSert **LIB**rary **WC**.**PL** :

When the program responds with LOC, digitize a point near the center of the drawing. The program will access the drive specified for library figures (See APPENDIX F) and then draw a water closet at a 1"=1' scale on the drawing. The point you digitized (ie: the center of your crosshair when you pressed the firebutton) is referred to as the origin of the figure. (See APPENDIX B for the naming conventions and a list of figures). Although you can make multiple copies, for now press :

[ret]

The scale as mentioned above is 1"=1'. If you want to insert the figure at a different scale, type:

INS LIB WC.PL SCALE .50 :

This time the figure will be inserted at .50"=1'. What we are really doing is telling the program to insert the figure at 1/2 size. (Do not confuse the scale of insertion with the selected drawing scale, the figures are originally drawn to an absolute size which may or may not be the scale you are using for your drawing. See APPENDIX B) Because of it's size, the second figure will not be as recognizable as the first one. The scale value can also be greater than 1.

The figure also can be inserted at angles. Type:

INS LIB WC.PL SCA .50 ANGLE 90 :

The figure will again be inserted at a scale of .50"=1', but in addition the figure will be rotated 90 degrees counterclockwise from the last figure. The angle can be any value from -360 to 360.

Another modifier to the **INSert** command is used for circles. Type:

INSert CIRcle RADius 1:

After the program responds with the LOC prompt, digitize (by pressing the left button on the mouse or firebutton on the joystick) a point near the center of the drawing. The program will draw a circle 2" in diameter centered on the point you digitized. (NOTE: Circles are shown with 16 sides as a default. The user may change the number of sides displayed up to 180 sides with the **SELEct CIRcle** command.) Circle dimensions may also be expressed in scaled English units. For a discussion, see Appendix J.

Arcs may be inserted using the **INSert ARC** command (F2). Keep in mind, that the three points required to define an arc must be defined in a counterclockwise sequence (see FIGURE 5). To demonstrate, type:

INSert ARC :

The program will respond with LOC. Now select three points as shown on FIGURE 5.

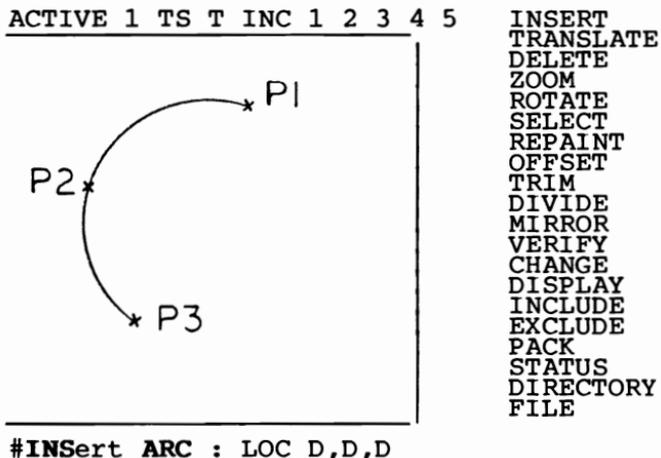


FIGURE 5

You do not have to press [return] to complete the command. Once created, arcs (and circles too, since a circle is a special type of arc) may be transformed into elliptical shapes. See the **CHANGE PARAMeter** command sequence for a detailed explanation.

CAUTION: An arc is a segment of a circle and is stored as such in the database with parameters including an origin (or center point). This origin is calculated from the three points and stored in integer format. If the arc defines an almost straight line, it is

possible to have an origin calculated that lies outside the range of maximum integer values causing erratic results. If you need a very slightly curved segment, you should create a circle and then use the **CHANGE PARAMETER** command to create an ellipse whose long edge corresponds to the shape you need.

The **TEXT** modifier, as it's name implies, is used to place text on the drawing.. Before we **INSERT TEXT**, lets change the text defaults. When the program starts, the default character size is .2" high and .2 " wide. This gives legible text for printouts, but is unreadable at full view. We could **ZOOM WINDOW** the area and "magnify" to make the text readable, but that is another command we'll get to later. For now type:

```
SElect TEXT HEIght 1 [ret]
SElect TEXT WIDth 1 [ret]
```

These commands change the default character size to a height and width of 1 inch. To insert text type:

```
INSert TEXT ABCDE :
```

The program will respond with the LOC prompt. Use your mouse (or joystick) and digitize (by pressing the left button on the mouse or firebutton on the joystick) a spot on the drawing. The text string ABCDE will appear on the screen at the point you have digitized, a [ret] is not necessary. The point you selected on the drawing is used as the lower left corner of the text.

To create a box, type:

```
INSert BOX :
```

and then select two points on the drawing representing the diagonal corners of the box. The points can be selected freehand with the mouse or entered in XY units from the keyboard.

DATA MODIFIERS

A command sequence usually consists of three parts, (1) the command, (2) the modifier(s), (3) and the data portion. We have used the modifiers **SPE**ed, **LINE**, **HOR**izontal, **VERT**ical, and **LENG**th. Before discussing data modifiers, we need to clarify what is meant by the phrase "data portion of the command". After you pressed the colon in the examples above, the program responded with "LOC". You were then in the data portion of the command where the program asked you for specific data. You responded by selecting points on the drawing both from the keyboard and with the mouse (or joystick). The Data Modifiers are used primarily with mouse or joystick input to allow the user to snap to specific points on existing lines, text, circles, and arcs. If you wanted to create a corner, it would be impossible to hold the crosshair exactly on the end of the first line. By using the **End** data modifier, however, the program will determine the precise end of the existing line and "snap" the "x" to it. The data modifiers are **End**, **Origin**, and **Near**. The **End** data modifier, will snap the "x" to the end of a line, arc, or circle closest to the selected point (NOTE: Circles are a special type of arc. Because of this data form, circles have two ends that coincide; One at 0 degrees and one at 360 degrees.). The **Origin** data modifier will snap the "x" to the center of a line, circle, or arc and to the lower left corner of text. The **Near** data modifier finds the point on a line closest to the point you digitized with the mouse (or joystick). TABLE 1 is a summary of entities and their appropriate data modifiers.

Before continuing with Data modifiers, lets clean up the screen. Type:

NEW [ret]

	LINE	CIRCLE	ARC	TEXT	BOX
END	X	X	X		
ORIGIN	X	X	X	X	X
NEAR	X				

TABLE 1

Since Data Modifiers operate on existing entities, first, insert a line (see INSERT LINE). Once you have a line on the drawing, type:

INSert LINE :

When you get the LOC prompt, type :

End

and move the crosshair to the existing line. You don't have to be right on the line; The program will detect the line if the crosshair is next to it. Press the firebutton and the screen will blank for a moment as the program goes to fast mode while searching the database for the line. When the display returns, an "x" will appear at the end of the line closest to the crosshair. (NOTE: If, by some chance you are too far from the line for the program to find it, the program will respond with a /. Try again.) Now move the crosshair away from the line and press the firebutton again. A second "x" will appear at the intersection of the crosshair. By pressing:

[ret]

a line will be drawn from the end of the line to your second point. Pressing "O" instead of "E" would have snapped to the center or "Origin" of the line. The "Near" modifier snaps to the point on the line nearest the crosshair. As shown in TABLE 1, all three of these modifiers can be used with line entities.

TRANSLATE

SYNTAX:

#**TR**Anslate [space] [optional modifier] [:] DATA

The **TR**Anslate command allows you to relocate entities on the drawing. The command requires starting and ending coordinates. (NOTE: The distance and direction between the two coordinates is the important value to keep in mind.) If you want to relocate an entity to a specific location using the mouse or joystick, you can use the data modifiers for either or both coordinates. Before starting, clear the screen with the **NEW** command. Now insert a vertical line near the center of the work area (see FIGURE 6).

To try the command type:

TRAnslate :

The program will respond with the prompt ENT. The program is asking you to identify the entity(s) you wish to move, so now digitize the line you just inserted. When you press the button, the screen will blank while the program searches for the line in the database. When the display returns a "D," will appear after the prompt and the line you digitized will "break up" by turning off every other pixel of the line. This confirms which entity the program has selected. (NOTE: Occasionally the breaking up will not be as noticeable on some lines. If the line was not found, the program will respond by placing a "/" on the command line. Circles and arcs also break up when selected, but text is denoted by a line through it. When you have completed digitizing the entities you wish to move, press the semi-colon:

[;]

A maximum of 50 entities may be selected. If during the selection process you digitized an entity by mistake, press [esc] and the command will be aborted. (NOTE: The escape key can be used to abort most commands.)

The program will respond with the LOC prompt. The program is asking you for the starting point of your **TRAN**slation. Type:

X0Y0,

The program will again respond with LOC. This time the program is asking for the ending point. Type:

X5Y0, [ret]

The program will erase the line you selected and redraw it 5" to the right of it's original location. (NOTE: Be sure to use the second comma).

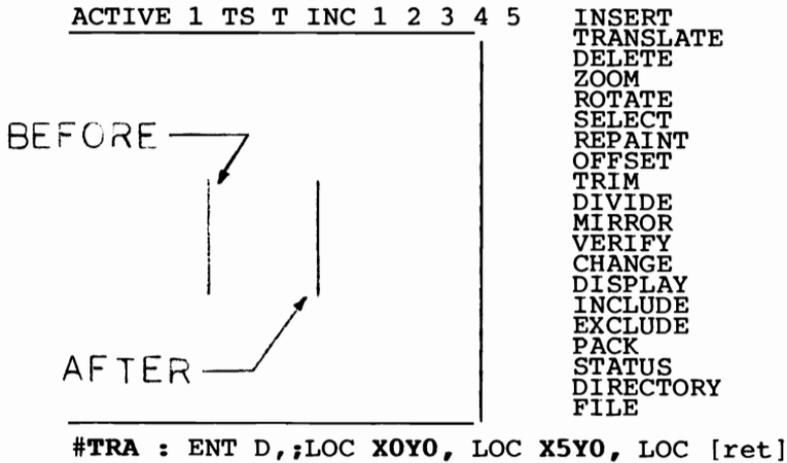


FIGURE 6

To move 5" to the left instead of 5" to the right, the correct way would be to type X5Y0,X0Y0, as the program will not allow negative coordinates. As a rule of thumb for keyboard translations, if you want to move to the right or up, then start at X0Y0. If you want to move down or to the left, end at X0Y0.

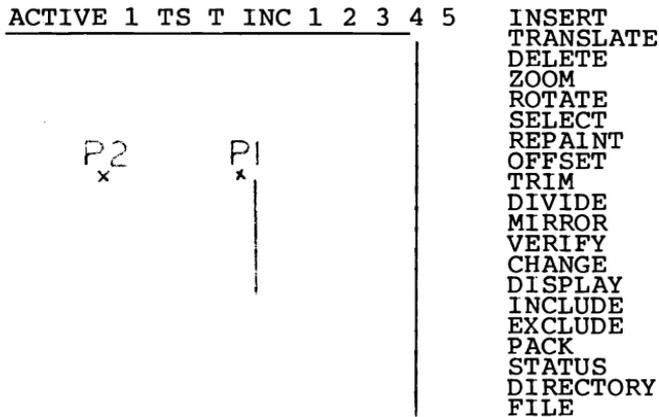
Translations can also be done by selecting points on the drawing with the mouse. To illustrate, type:

TRAnslate :

At the ENT prompt, digitize the vertical line (as created above) and press:

[;]

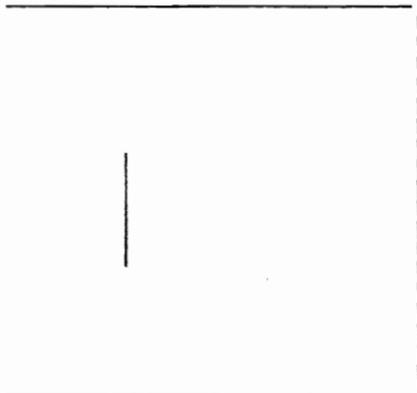
At the LOC prompt digitize 2 points as shown on FIGURE 7. The resulting translation will look like FIGURE 8.



#**TRAn**slate : ENT D,; LOC D, LOC D, LOC [ret]

FIGURE 7
(BEFORE)

ACTIVE 1 TS T INC 1 2 3 4 5



#_

INSERT
TRANSLATE
DELETE
ZOOM
ROTATE
SELECT
REPAINT
OFFSET
TRIM
DIVIDE
MIRROR
VERIFY
CHANGE
DISPLAY
INCLUDE
EXCLUDE
PACK
STATUS
DIRECTORY
FILE

FIGURE 8
(AFTER)

For an example using the data modifiers, first, insert a horizontal line (see FIGURE 9) and type:

TRANslate:

At the ENT prompt, digitize the horizontal line and press:

[;]

This time when the program responds with LOC type:

End

and digitize the same line at point P1. The "x" will snap to the end of the line closest to the crosshair after the screen display returns. At the second LOC prompt, type:

Origin

and digitize the vertical line at point P2 and press:

[ret]

The line will be relocated with one end at the center of the vertical line.

The **COPY** modifier to the **TRANs**late command works similarly to the unmodified **TRANs**late command except it leaves a copy of the entity(s) in the original location. To demonstrate type:

TRANslate **COPY** :

Digitize the horizontal line as before and press:

[;]

At the LOC prompt digitize two points, P3 and P4, on the drawing and then press:

[ret]

This time the line will not be erased at the old location, but will be copied to a new location. You may make multiple copies by digitizing more than two points.

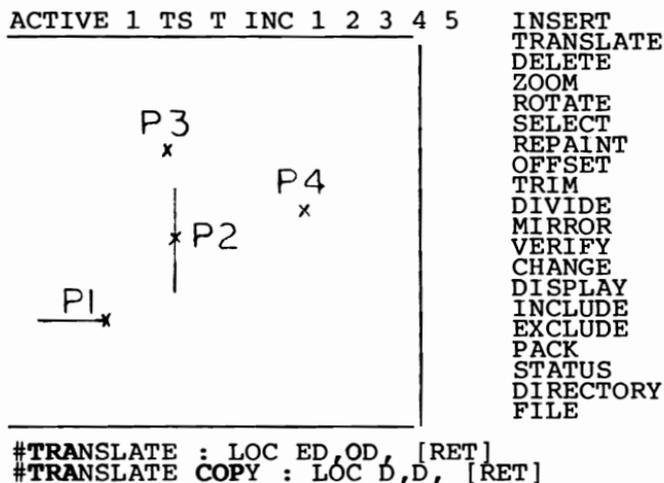


FIGURE 9

DELETE

SYNTAX:

#DELeTe [space] : DATA

The **DELeTe** command, as it's name implies, is used to erase entities from a drawing. To **DELeTe** entities type:

DELeTe:

At the ENT prompt digitize the entities you wish to delete (up to 50). As you select the entities, the program will acknowledge your selections by breaking up lines, etc. If you make a mistake, press [esc] to abort the command. To complete the command press:

[ret]

ZOOM

SYNTAX:

#ZOOM [space] [modifier] [:] DATA

ZOOM WINDOW allows the user to define an area of the drawing to be magnified. To demonstrate, first insert the text string "ABCDE" (see INSERT TEXT). Now type :

ZOOM WINDOW:

Digitize (by pressing the left button on the mouse or firebutton on the joystick) a point to the left and slightly above the text. A small "x" will appear. Now move the crosshair and digitize a point slightly to the right and below the text. What you are doing is defining a window around the text. After you digitize the second point, the screen will go blank for a moment and then the text will reappear, this time much

larger. (NOTE: A number of the commands will cause the screen to blank. This is due to the clock speed being reset to 2 Mz for intensive calculations). You can continue to zoom in to the resolution of the data.

The **ACROSS** modifier to the **ZOOM** command allows the user to scroll magnified portions of the drawing. The syntax is :

ZOOM ACROSS :

The program will respond with LOC. Digitize two points on the drawing and the view will scroll the distance from the first point to the second. (NOTE: This command is ineffective at the full view).

To return to the full view of your drawing, type:

ZOOM ALL [ret]

Again the screen will blank and then return you to the full display.

ROTATE

SYNTAX:

#**ROT**ate [space] [optional modifier] [space] [angle] [:] DATA

This command allows the rotation of entities about a point at an angle you select where angle is any real number between -360 to 360. A positive angle will cause a counterclockwise rotation, conversely, a negative number will cause a clockwise rotation. To demonstrate, first clear the screen with the **NEW** command and then insert a horizontal line as shown in FIGURE 10. Now type:

ROTate 90 :

The program will respond with ENT. Now digitize the horizontal line and press:

[;]

The line will break up in the same fashion as with the **TRAN**slate command. When the prompt "LOC" appears, digitize a point, P1 on FIGURE 10. The line will now rotate 90 degrees about that point. You could as easily have used any real number from -360 to 360. The data modifiers, (End, Near, and Origin), can be used to precisely position your rotation point. Now type:

ROTate **COPY** 90 :

At the ENT prompt digitize the line you just rotated. Again press:

[;]

but this time type:

Origin

and again digitize the line. The program will copy the line and rotate it 90 degrees about the center of the line with the final figure being that of a cross.

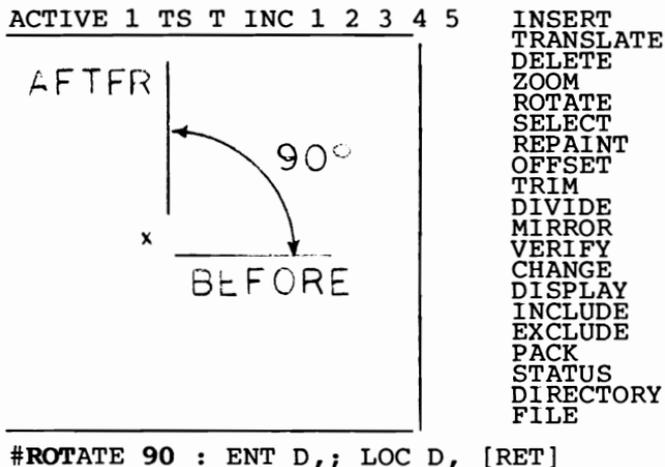


FIGURE 10

SELECT

SYNTAX:

#**SE**lect [space] [modifier(s)] [data]

The **SE**lect command, with different modifiers, is used to modify program parameters. The active layer, as represented by the number adjacent to the word **ACTIVE** in the upper left corner of your screen, can be selected by use of the **LAYER** modifier. Assuming the current **ACTIVE** layer is 1, type:

SElect **LAYER** 3 [ret]

The highlighted "1" next to "ACTIVE" in the upper left corner of the screen will change to a "3". This signifies the active layer is now "3" and any entities inserted will reside on layer 3.

The program's default character size is .2" high and .2" wide. If you want all of your text to be inserted at a height of 1", type:

SElect **TEXT HEIGHT** 1 [ret]

All subsequent text inserted will be 1" high. If you want to alter the default width, substitute **WIDTH** for **HEIGHT**.

The **SE**lect command can also be used to turn text on or off. If you don't have a text string on the drawing, insert one like you did at the first part of the tutorial. Then type:

SElect **TEXT OFF** [ret]

The letter "T" to the right of the letters "TS" (which stand for Text Status) on the Status Line at the top of the screen will no longer be highlighted. Text already present on the screen will remain visible

until the screen is refreshed. To verify this type:

REPaint [ret]

All text will be removed from the screen until you type the command **SElect TEXT ON [ret]**. By turning text off, the program will be speeded up due to the reduced load on the CPU.

The **SElect** command is also used to specify the number of sides displayed on a circle. The computer draws a circle using a series of straight lines, so the greater the number of lines, the better the resolution of the circle. Unfortunately, it also means the longer it takes the computer to calculate the coordinates. The default value, 16, is a compromise between speed and resolution. To demonstrate type:

INSert CIRCle RADIUS 2 :

When the program responds with LOC, digitize a point near the center of the workscreen. This creates a typical circle with the default value. Now type:

SElect CIRCle 8 [ret]

where 8 represents the number of sides. The program can use any even number from 2 to 180. Now **INSert** another circle adjacent to the first circle and compare the difference. As a final note, the number of sides selected (or default) has no effect on the hardcopy produced by the printer.

The **SPEed** modifier helps control the movement of the crosshair. If you are having difficulty accurately placing the crosshair due to excessive movement, type:

SElect SPEed 50 [ret]

Increasing the number will slow down the crosshair.

If you are using two disk drives, the **DEVICE** modifier allows you to toggle between them when you want to view different directories. The syntax is:

SElect DEVICE # [ret]

where # represents the device # usually 8 or 9.

If you are working in scaled English units (see Appendix J), you may change the scale with the **SCALE** modifier. As an example, for a scale of $1/4" = 1'$, a popular architectural scale, type:

SElect SCALE .25" = 1' [ret]

All numbers must be entered in decimal form, ie .25" for $1/4"$, and you must leave a space between the = sign and the numbers.

REPAINT

SYNTAX:

#REPaint [ret]

Occasionally, as you use the program you will notice bits of graphic "trash" left over from commands that modify entities. To clean the screen up type:

REPaint [ret]

The screen will blank for a moment while your figure is redrawn. Should some graphic trash still remain, try to **VERify** and **DELEte** it if the program acknowledges it's presence. If it won't verify, try the **PACK** command and then **REPaint**. This should do the job if the trash is due to corrupted data. If none of the above works, please feel free to write me at the address in the front of the manual. If possible, enclose a copy of your data disk with a description of your problem.

OFFSET

SYNTAX:

OFFset [space] [distance] [:] DATA

Occasionally you may want to construct multiple parallel lines for a graph or chart. Add the ability to define the distances between lines and you can see **OFFset** is a very powerful command. To construct parallel lines .5 inches apart, type:

OFFset .5:

When the program prompts you with ENT, digitize a line by placing the crosshair over it and pressing the FIRE button. (NOTE: **OFFset** does not work with text, circles, or arcs.). The line will "break up" and the program will respond with the LOC prompt. Now digitize a point to one side of the line. The program will draw a line parallel to the line you digitized and .5 inches away. You may continue to digitize lines using the sequence above to create multiple parallel lines .5 inches apart. The command will work with lines at any angle and is particularly useful for such jobs as creating forms or perhaps laying out walls on a floorplan. To exit this command press:

[ret].

The offset distance may also be expressed in scaled English units (see Appendix J). As an example, type:

OFFset 3-1/2" :

and create a parallel line as discussed above. If you are working in the default scale of $1/4" = 1'$, the lines will be approximately .072" apart on the drawing.

TRIM

SYNTAX:

#**TRIM** [space] [optional modifier] [:] DATA

The **TRIM** command allows the user to modify the length of existing line entities. (NOTE: **TRIM** will not work with text, circles or arcs) The **TRIM** command supports only one modifier, **INTERSECTION**. To demonstrate, insert two lines, one horizontal and one vertical, as shown in FIGURE 11. Then type:

TRIM:

When the program responds with ENT, digitize the horizontal line by moving the crosshair over it and pressing the firebutton. The line will "break up" and you will be prompted "LOC". Digitize a point, P1, beyond the end of the line and roughly "on line" with an imaginary extension of the line. The line will then extend to the point as shown on FIGURE 12. This command can be repeated until you exit the command by pressing:

[ret]

The **INTERSECTION** modifier to the **TRIM** command is used to terminate a line at its intersection with another line. Type:

TRIM INTERSECTION:

AT the ENT prompt digitize the vertical line (see FIGURE 11). At this point, unlike the unmodified **TRIM** command, the program will again respond with the ENT prompt. This time, however, the program is asking you to digitize the line to which you wish to trim the vertical line. Digitize the horizontal line and the vertical line will be trimmed even with it (the horizontal line that is).

You can continue this command until you press:

[ret]

ACTIVE	1	TS	T	INC	1	2	3	4	5	
										INSERT
										TRANSLATE
										DELETE
										ZOOM
										ROTATE
										SELECT
										REPAINT
										OFFSET
										TRIM
										DIVIDE
										MIRROR
										VERIFY
										CHANGE
										DISPLAY
										INCLUDE
										EXCLUDE
										PACK
										STATUS
										DIRECTORY
										FILE

#TRIM : ENT D, LOC D, [RET]

FIGURE 11

ACTIVE	1	TS	T	INC	1	2	3	4	5	
										INSERT
										TRANSLATE
										DELETE
										ZOOM
										ROTATE
										SELECT
										REPAINT
										OFFSET
										TRIM
										DIVIDE
										MIRROR
										VERIFY
										CHANGE
										DISPLAY
										INCLUDE
										EXCLUDE
										PACK
										STATUS
										DIRECTORY
										FILE

#

FIGURE 12

DIVIDE

SYNTAX:

#**DIVide** [space] [optional modifier] [:] DATA

The **DIVide** command (also see the **TRIm** command) allows the user to break line entities into smaller segments. After division, a line will appear the same, however if you **VERify** it you will find it to be composed of two segments. As with the **TRIm** command, **DIVide** will not work on text, circles, or arcs. The only modifier supported by the **DIVide** command is **INTersection**. This modifier allow the precise division of a line at it's intersection with another line. To use the **DIVide** command type:

DIVide :

and the program will prompt you with ENT. Digitize the line you wish to divide by placing the crosshair over it and pressing the firebutton. This action will cause the line to "break up" indicating the selected line. When the program responds with LOC, digitize the point at which you wish to divide the line. The line will "reform" and the program will again prompt you with ENT. You may then repeat the procedure until you press:

[ret]

The **INTersection** modifier works as follows. First type:

DIVide INTersection :

The program will respond with ENT. Digitize the line you wish to divide by placing the crosshair over it and pressing the firebutton. The line will "break up" and the program will again prompt you with ENT.

Now digitize the intersecting line and the first line will "reform" and again you will receive the ENT prompt.

To exit the command press:

[ret]

As with the unmodified **DIVide** command, the selected line will be broken into two segments.

MIRROR

SYNTAX:

#**MIR**rOr [space] [optional modifier] [:] DATA

The **MIR**rOr command is used create the reflection of entities about a user defined axis. An axis can be defined as a real or imaginary straight line about which entities can be mirrored. On a clean screen (use the **NEW** command if necessary) insert a horizontal line, L1, at roughly the center of your drawing (see FIGURE 13). Now insert a diagonal line, L2 on FIGURE 13, using the **End** data modifier to connect it to the horizontal line, L1. Type:

MIRrOr:

At the ENT prompt, digitize the diagonal line. Press :

[;]

and the program will respond with LOC. The program is asking for two points that define the ends of the axis. For this example let's use the horizontal line. Press:

[E]

and then digitize one end of the horizontal line. Press:

[E]

again and digitize the other end of the same line. The diagonal line will now be mirrored about the horizontal line (see FIGURE 14).

Entities may be mirrored leaving the originals unchanged with the **COPY** modifier.

Type:

MIRror COPY:

Repeat the above procedure and the resulting figure will take the form of an arrow.

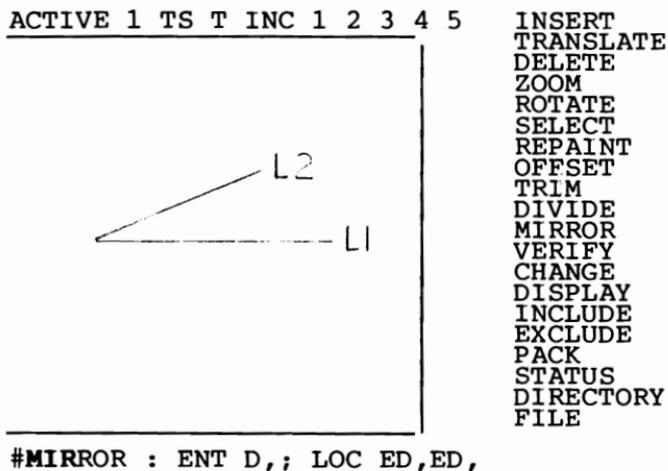


FIGURE 13

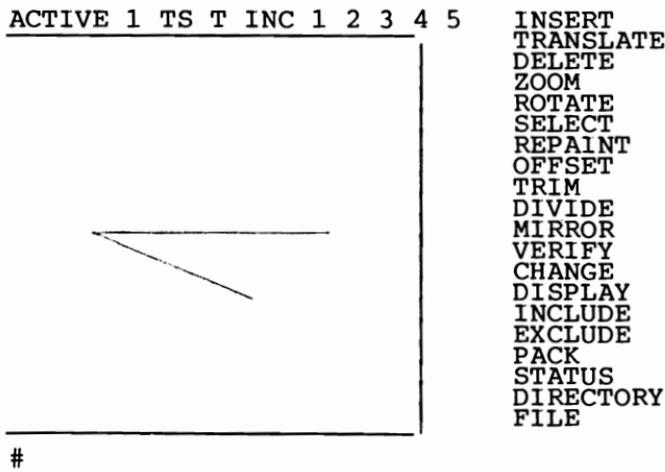


FIGURE 14

NOTE: The MIRror command will not work with text or boxes, and only on the horizontal axis with ellipses.

VERIFY

SYNTAX:

#VERify [:] DATA

The **VERify** command allows the user to extract information about an entity from the database. TABLE 2 gives the type of information you can expect about each entity.

<u>ENTITY</u>	LINE	CIRCLE	ARC	TEXT	ELLIPSE	BOX
TYPE *	X	X	X	X	X	X
ORIGIN	N/A	X	X	X	X	X
START X,Y	X	N/A	N/A	N/A	N/A	N/A
STOP X,Y	X	N/A	N/A	N/A	N/A	N/A
START ANGLE	N/A	X	X	N/A	X	X
STOP ANGLE	N/A	X	X	N/A	X	X
RADIUS X **	N/A	X	X	N/A	X	X
RADIUS Y **	N/A	X	X	N/A	X	X
LENGTH	X	N/A	N/A	N/A	N/A	N/A
TEXT HEIGHT ***	N/A	N/A	N/A	X	N/A	N/A
TEXT WIDTH ***	N/A	N/A	N/A	X	N/A	N/A
LAYER	X	X	X	X	X	X
ANGLE	N/A	N/A	N/A	X	X	X

TABLE 2

* Circles, arcs, ellipses and boxes are listed as arcs.

** Radius X and Y are the same for circles and arcs.

*** The value given is for individual character size.

To use the command type:

VERify :

When the program responds with ENT, select the entity of interest by placing the crosshair over it and pressing the firebutton. The screen will blank momentarily while the program searches for the entity. The graphic display will be turned off to allow you to read the data. To regain the graphic display type:

RESume [ret]

CHANGE

SYNTAX:

#**CHANGE** [space] [modifier(s)] [space] [numeric data] [:] **DATA**

The **CHANGE** command is used to modify the characteristics of an existing entity. The **CHANGE** command is not to be confused with the **SELECT** command. The **SELECT** command works on program characteristics. When program characteristics are changed, all subsequent entities inserted into the program will conform to the new requirements.

The available modifiers for the **CHANGE** command are:

- 1 **TEXT HEIGHT**
- 2 **TEXT WIDTH**
- 3 **LAYER**
- 4 **PARAMETERS**

The **HEIGHT** and **WIDTH** modifiers can be combined in a single command, ie:

CHANGE TEXT HEIGHT # WIDTH # :

where "#" represents the character size in inches. At the ENT prompt, digitize the text string in question. This feature is useful to custom fit text to a particular area on a drawing. Occasionally, the text transformation will leave bits of graphic "trash" behind. The **REPAINT** command should clear this up.

The **LAYER** modifier allows the user to change the layer on which an entity is stored. As an example, to change an entity to layer 2, type:

CHANGE LAYER 2 :

When the program responds with ENT, digitize the entity by placing the crosshair over it and pressing

the firebutton. The program will then relocate the entity's data to layer 2 and though the entity looks the same, it now resides on the second layer.

The **PARAMeter** modifier works only with existing circular figures. With this modifier the user can vary arc lengths and radii to suit. Another application of this command is the creation of elliptical figures from existing circular figures. The command requires 4 data entries. The syntax is:

CHANGE PARAMeter #1 #2 #3 #4 :

where #1, #2, #3, and #4 represent respectively the length of the X axis, the length of the Y axis, the starting angle in degrees, and the ending angle in degrees (see FIGURE 15). The angles may be any real number between -360 and 360, but the starting angle must be less than the ending angle. Warning: The X value must be greater than the Y value.

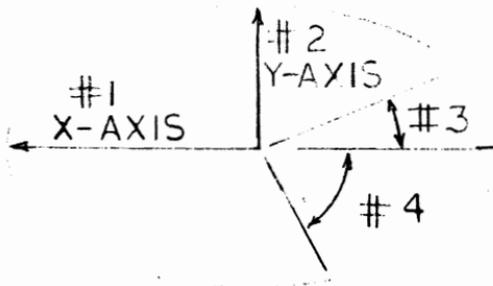


FIGURE 15

For example, to change a circle to the left half of a 3" X 2" ellipse, type:

CHAnge PARAMeter 3 2 90 270 :

Digitize a circle on the drawing and the program will erase it and redraw it as an elliptical figure. Should fragments of the old circle remain, use the **REPaint** command to clean things up.

DISPLAY

SYNTAX:

#**DIS**play [ret]

The **DIS**play command "turns off" the graphic part of the screen revealing information such as previous commands that have scrolled up and are no longer visible. NOTE: The **RE**paint and **NE**w commands will erase this information.

INCLUDE

SYNTAX:

#**IN**clude [space] [numeric data] [ret]

The **IN**clude command restores layers that have been previously turned off with the **EX**clude command. To use the command type:

INclude # [ret]

where # represents one of the 5 layers. Only one layer may be included at a time.

EXCLUDE

SYNTAX:

#**EX**clude [space] [numeric data] [ret]

The **EX**clude command turns off layers that are visible on the drawing. Layers that are excluded have not been deleted but are simply not shown on the drawing. **EX**cluded layers are not highlighted on the status line at the top of the screen. You may not exclude the active layer or more than one layer at a time.

As an exercise, clear the screen with the **NEW** command and **INS**ert several lines, each on a different layer (see **SE**lect **LAY**er and **INS**ert **LI**ne). **IN**clude and **EX**clude layers at random and observe the results. As you **EX**clude a layer, the screen will be redrawn with that layer omitted and it's number deemphasized on the status line. An **IN**cluded layer will reappear and it's number reemphasized on the status line.

PACK

SYNTAX:

#**PACK** [ret]

During the course of a drawing session, holes can be created in the database as entities are manipulated. The **PACK** command compresses data in memory and attempts to delete any corrupted data elements. The **PACK** command rearranges the data to fill in these holes. To use the command type:

PACK [ret]

STATUS

SYNTAX:

#**ST**atus [ret]

The vectors that comprise your drawing are stored within the computer in a database. While working on a large drawing, the user needs to keep an eye on his database. If you exceed the allowable number of entities in the database your drawing could become corrupted. The **ST**atus command displays the current state of the database. To use the command type:

STatus [ret]

The graphic display will be turned off, and the database information printed to the screen. FIGURE 15 is a typical status display.

	LAYER				
	1	2	3	4	5
LINES	20	0	0	0	0
CIRCLES	6	0	0	0	0
TEXT	10	0	0	0	0

LINE ENTITIES (MAX 400 EACH LAYER)
CIRCLES (MAX 100 EACH LAYER)
TEXT STRINGS (MAX 100 EACH LAYER)

FREE BYTES OF DATA STORAGE= 5400

SCALE : .25" = 1'

FIGURE 15

The numbers 1 thru 5 on the first line represent, as you might suspect, the five layers of the program. The column on the left represents the entity types; LINES, CIRCLES, AND TEXT. Below the numbers 1 thru 5 are columns of numbers showing the total number of

these entities in each layer. (NOTE: Circles, arcs, elliptical figures, and boxes are stored in the same section of the database.) For example, the number of circles in layer 1 as shown above is 6.

The next three lines are reminders of the total number of entities allowed on each layer. This means that you may have a total of 2000 lines in your drawing as long as you do not exceed 400 lines on a layer. The 5400 bytes of free data storage shown on the bottom line represents the amount of text storage available. Because lines of text can be of different lengths, it is impossible to predict the exact amount of storage necessary. Consequently, memory is allocated as text is entered. Although the program is configured to allow a maximum of 100 text strings on each layer, the length of the text strings may affect the actual number you can insert. The SCALE display indicates the scale for English Units (See Appendix J).

To call back the graphic display type:

RESume [ret]

and continue with your work.

DIRECTORY

SYNTAX:

#DIRectory [space] [optional file data] [ret]

The DIRectory command allows the user to list the contents of the disk. The use of this command will not affect the drawing in the workspace. When used, the graphic display will clear allowing the user to read the information. Type:

DIRectory [ret]

The optional file data represents one or more of the beginning letters of a filename. This allows the user to narrow the search for a particular file or groups of files. For example, on the program disk are a number of library figures representing plan views of different sized windows. All of these figures begin with "WIN.PL." (see APPENDIX B, LIBRARY FIGURES). If you wanted to verify a particular window size type:

DIRectory WIN [ret]

The graphic display will clear and the files beginning with "WIN" will be scrolled across the screen. To interrupt the scrolling, press the NO SCROLL key at the top of your keyboard.

When using two drives, use the **SElect DEvIce** command to toggle between the directories.

To return to the graphic display type:

RESume [ret]

and continue where you left off.

FILE

SYNTAX:

#FILE [space] [filename] [ret]

The FILE command allows the user to store drawings on disk. Filenames up to 16 characters may be used. (NOTE: It not a good idea to store your drawings on the program disk. Use a separate formatted disk to store your drawings. New users refer to APPENDIX H). To save a drawing named "TEST", type:

FILE TEST [ret]

The drive will come on and your drawing will be stored under the filename "TEST". The program retains the filename, so subsequent FILings will only require you to type "FILE [ret]" until the end of the session. The program also retains the filename of a drawing LOAded into the workspace. A good rule of thumb is to file every half hour or less, because if you have a power glitch, you will lose everything you have done since your last FILE.

The program defaults to the drive specified for drawings in the CONFIG program. The FILE command does not differentiate between saving a drawing file or a library figure file. If you are saving a library figure, you must place your library disk in the drive specified for drawings.

THE FOLLOWING SIX COMMANDS ARE NOT LISTED IN THE MENU

LOAD

SYNTAX:

#LOAD [space] [filename] [ret]

The **LOAD** command is used to retrieve drawings stored on disk. To retrieve a drawing named "TEST" from the disk, type:

LOAD TEST [ret]

The disk drive specified for the drawing files, will be accessed and then the screen will blank for a few moments while the program generates the graphics. The program "remembers" your filename, so subsequent **FILings** do not require you to enter the filename. (see the **FILE** command).

NEW

SYNTAX:

#NEW [space] [optional modifier] [space] [number] [ret]

The **NEW** command is used to erase drawing data from memory. (WARNING: If you have not **FILEd** your drawing before using this command all data entered since your last **FILE** will be lost!) If this command is used without the **LAYER** modifier, the resulting view will be default size with all layers visable. To delete an entire drawing type:

NEW [ret]

To selectively delete a layer such as layer 5, type:

NEW LAYER 5 [ret]

RESUME

SYNTAX:

#RESume [ret]

To restore the graphic screen when it has been "turned off" by the **DIS**play or some other command, type:

RESume [ret]

LIBRARY

SYNTAX:

#LIBrary [space] [coordinate data] [ret]

Custom library figures can be created by the user to handle special applications. DO NOT CONFUSE THE LIBRARY COMMAND WITH THE LIBRARY MODIFIER TO THE INSERT COMMAND. To create a figure, draw it, then decide upon an origin for the figure in X and Y coordinates. The origin of a figure is defined as the point where the figure is inserted into a drawing. (See the **INS**ert **LIB**rary command.) For example, the origin of the water closet shown in APPENDIX B is located at the center and slightly to the rear of the figure. This origin was chosen because a real watercloset is not located hard against the wall, but offset somewhat. Once you have decided upon an origin (use the **VER**ify command to locate your figure's components), type:

LIBrary X#Y# [ret]

where X#Y# represents the origin of your figure. Though the figure looks the same, the coordinates of it's components, as stored in the database, have been transformed. Now, **FILE** your figure under an appropriate filename. After you have **FILE**d your figure, **REP**aint your display to see how the figure

moved so the origin you selected is now located at the bottom left corner of the work area. With most figures, a portion of them will now be located outside the work area and thus not visible. NOTE: The **FILE** command will default to the drive specified for drawing files.

EXIT

SYNTAX:

#EXIT [ret]

This is the only command requiring four letters and is used to leave the drawing module. After you press [return], the program will ask if you want to save your work. If you answer No, you will be returned to the Main Menu. If you answer Yes, then you will be returned to the program so you can file your drawing. If you do not file your drawing, then all input since your last file will be lost.

CHECK

SYNTAX:

CHEck [ret]

The **CHEck** command deletes entities external to the drawing boundary defined as a 22" wide by 16" high area. Entities external to the drawing can be accidentally created during such commands as **TRANs**late and **ROT**ate. For normal drawing purposes, other than putting an extra load on the program, they don't usually have much effect. Where they can cause a problem, is when you are trying to print a drawing. Under some conditions, external entities can cause the print module to lock up. Since the print module uses data already on disk, this won't cause you to lose anything, but can certainly be annoying. CAUTION: Don't use this command when creating **LIB**rary figures.

PRINTING

From the Main Menu, option #3 is to print a drawing. Provided you have selected the correct printer driver when you configured the program (option 5 on the Main Menu), this option allows you to print your drawing on a dot matrix printer. When you select the print module, the disk drive will be accessed and the module loaded. When the module is loaded, you will be prompted for the name of the file you wish to print. If you need to check the Directory, press:

? [ret]

Otherwise, type in the name of your drawing. (NOTE: If you are using a two drive system, the program will look for the file in the drive you specified for drawings when you configured the program.) If you want to print a sample drawing, use the filename:

CHAS.HOUSE.1

making sure that the program disk is in the drive allocated for drawings. After your file has been loaded, the program will display the current output settings.

You are now asked if these settings are satisfactory. If you want to change any of them, press:

N [ret]

and you will then be asked about each setting. The next five paragraphs provide a description of each of them.

The first item is the Pass Number. With "HOME DESIGNER", the user can create a 16" high drawing on an 8" printer by printing out the drawing in two passes at full scale. Drawings printed on a vellum

material and then carefully spliced can be blueprinted with excellent results. The lower half is printed using PASS1 and the upper half with PASS2. If you have a roll of vellum and don't need to feed each sheet individually, the CONT option will print both passes. For most drawings, the default setting of PASS1 will be sufficient.

The next item is the Scale. "HOME DESIGNER" is an object based program and stores it's data for a drawing 16" high X 22" long. If you chose a scale of 1, you would have to use the PASS option described above to see your whole drawing since most printers have a print field 8" wide. The default scale of .5 shrinks your drawing so that it can be printed half-size on a 8" X 11" sheet of paper. Until you are ready to print a full size final drawing, these half-size check prints do quite nicely.

The next item concerns the number of sides for circular figures including ellipses. The computer draws circles as a number of short straight lines. The greater the number of lines, the better the appearance of the circular figure. This improved appearance reaches a point of diminishing returns based on the size of the circle and the resolution of the printer. In testing a printer with the highest resolution of the printers supported, for most circles, an arc length of 10 degrees or 36 sides works quite well. Generally speaking, the smaller the circle, the fewer the number of sides necessary to get a good appearance. The only restrictions to the number you choose is that it must be an even number between 2 and 180 inclusive. Keep in mind that the more sides you specify, the longer the printing will take. For a large number of circles, this can be a significant amount of time. In practice, very few drawings will be exactly what you want the first time out. You will often see things you would like to add, change, or modify in some way. I generally make my first print using the default value and adjust the

number of sides on subsequent drawings based on the first one.

The next line displays the active layers. "HOME DESIGNER" supports 5 independent layers for data storage and the user can print any number or combination. You will be asked, layer by layer, whether or not to include them. Answer "Y" or "N" and press [return] at each prompt.

The final line indicates whether or not you want your printout in draft mode or high resolution graphics. If your printer is not capable of high resolution output, this line will not be presented. Because of the greatly reduced printing speed of high res, you will probably want to restrict its use to final copies and use draft mode the rest of the time. Table 1 is a list of those printers supporting high resolution printing.

After changing the settings, you will be returned to the screen displaying the settings and again asked if you wish to change anything. This time type:

Y [ret]

The screen will blank indicating the fast mode and your drawing will be sent to the printer. "HOME DESIGNER" has an internal line buffer, so expect the printer to pause every 5 lines (3 lines for high res) while the program "thinks" about the next set.

After the printing has been completed, you will be asked if you want to print the same file again. This option allows you to print a file at different scales without having to reload it each time. If you choose to reprint the file, the printing menu will reappear and you may proceed as before. If you choose not to reprint the file, you will then be asked if you want to print another file. If you choose to continue, you will be asked for another filename and begin again.

If you choose not to continue, you will exit the print module and return to the Main Menu.

TABLE 1

PRINTER	DPI (DRAFT MODE)	DPI (HIGH RESOLUTION)
CITOH PROWRITER	72 X 160	144 X 160
EPSON RX 80	72 X 120	216 X 240
EPSON FX 80	72 X 120	216 X 240
PANASONIC 1091i	72 X 120	216 X 240
STAR GEMINI 10X	72 X 120	144 X 240
STAR GEMINI 15X	72 X 120	\$144 X 240
STAR SG10	72 X 120	*216 X 240
STAR SG15'	72 X 120	\$*216 X 240

\$ Due to buffer size, draft mode for 15" carriage printers will be a full 13.6" wide, but High Resolution will only be about 12.75" wide.

* The Star SG10 and SG15 have to be set in the IBM mode (Dip Switch 2-2, page 231 of the Star Reference Manual) for High Resolution. For Draft mode leave the printer in the STAR mode. If you don't feel like fooling with the switches, identify your printer as a GEMINI during the Configure session but remember that you are giving up 1/3 of your horizontal resolution.

PLOTTING

The Plotting module, like the Printing module, is accessed from the Main Menu. (NOTE: Before using this module, you must configure the program for the plotter you are using. The configuration module is #5 on the Main Menu. For hardware setup see Appendix D.) When the plot option is selected from the main menu, the module will be loaded from disk. After loading, you will be prompted for the name of the drawing file. If you are not sure of the filename, press:

? [ret]

Otherwise, type in the name of your drawing. (NOTE: If you are using a two drive system, the program will look for the file in the drive you specified for drawings when you configured the program.) If you want to plot a sample drawing, use the filename:

CHAS.HOUSE.1

making sure that the program disk is in the drive allocated for drawings. After your file has been loaded, the program will display the current output settings.

You are now asked if these settings are satisfactory. If you want to change any of them, press:

N [ret]

and you will then be asked about each setting. The next three paragraphs provide a description of each of them.

The first group of settings indicates the pen number used for each of the five layers. With multi-pen plotters, you can have layers printed in different colors. If you answered "N" above, you will be asked

for the pen number for each layer. See your plotter manual if you are not sure of the numbering sequence for your pens (NOTE: The CBM 1520 plots four small boxes when it is turned on. The pens are used from left to right giving a quick visual check of color locations.)

The next setting represents the scale of the drawing and is pretty much self explanatory except for the CBM 1520 plotter. Since the CBM 1520 has a vertical print resolution of only 480 points and the data is stored in a integer format (0 to 16000), the default scale of .03 was chosen to allow a drawing to "fit" the range of the little plotter.

The final line displays the active layers. "HOME DESIGNER" supports 5 independent layers for data storage and the user can print any number or combination. You will be asked, layer by layer, whether or not to include them. Answer "Y" or "N" and press [return] at each prompt.

After changing the settings, you will be returned to the screen displaying the settings and again asked if you wish to change anything. This time type:

Y [ret]

After the plotting has been completed, you will be asked if you want to plot the same file again. This option allows you to print a file at different scales without having to reload it each time. If you choose to replot the file, the plotting menu will reappear and you may proceed as before. If you choose not to replot the file, you will then be asked if you want to plot another file. If you choose to continue, you will be asked for another filename and begin again. If you choose not to continue, you will exit the plot module and return to the Main Menu.

GLOSSARY

- COMMAND - Program instructions used to create, store, and print drawings.
- COORDINATES - The numbers used to locate specific points on the drawing. These number take the form of X#Y# where X0Y0 is located at the bottom left corner of the drawing.
- DATA BASE - The organized alpha numeric data stored within the computer representing a drawing.
- DEFAULT - The setting or value that the computer will defer to in the absence of modifying instructions from the user.
- DIGITIZE - To select a point or entity on the drawing usually by pressing the firebutton at the desired spot.
- ENTITY - A drawing component such as a line, circular figure, or text string.
- FORMATTED DISK - A disk which has been prepared by the disk drive to receive data.
- FUNCTION KEYS - The four keys located at the upper right corner of the keyboard. They are labeled F1 thru F8 with even numbers representing the shifted key.
- INTERFACE - The cable linking the computer and a Non-Commodore printer.
- MENU - The list of commands located at the right side of the screen.
- MOUSE - A peripheral device similar to a trackball which plugs into the game port and is used to input data.

MODIFIER - Additional specifications or parameters which can be given to a command.

OBJECT - See ENTITY.

ORIGIN - The center of a line or circle. For the purposes of this program, the lower left corner of a line of text is considered the origin of the text.

PIXEL - In practice, a single bit from the screen map. The monochrome graphics screen is normally composed of 320 bits or pixels across by 200 bits or pixels down.

RADIUS - One half of the diameter of a circle or the distance from the center to any point on the outer edge of the circle.

TEXT STRING - Any series of alpha numeric characters.

APPENDIX A
COMMAND SUMMARY

This summary lists all commands and modifiers. User data and carriage returns are enclosed in brackets , []. For detailed information, use the index at the back of the manual to locate the particular command.

CHANGE TEXT HEIGHT [new text height] :
 TEXT WIDTH [new text width] :
 TEXT HEIGHT [new height] **WIDTH** [new width] :
 LAYER [new layer] :
 PARAMETER [new parameters] :

CHECK [ret]

DELETE :

DIRECTORY [optional partial or full filename] [ret]

DISPLAY [ret]

DIVIDE :
 INTERSECTION :

EXCLUDE [layer to be excluded] [ret]

EXIT [ret]

FILE [filename] [ret]

INCLUDE [layer to be included] [ret]

INSERT LINE :
 HORIZONTAL :
 VERTICAL :
 HORIZONTAL LENGTH [length] :
 VERTICAL LENGTH [length] :
 CIRCLE RADIUS [radius] :
 TEXT [textstring] :
 LIBRARY [filename] :
 ANGLE [angle in degrees] :
 SCALE [scale ratio] :
 ANGLE [angle] **SCALE** [scale ratio] :

ARC :

LIBRARY [XY origin of new figure] [ret]

LOAD [filename]

MIRROR :
 COPY :

NEW [ret]
 LAYER [layer to be deleted] [ret]

OFFSET [distance between lines] :

PACK [ret]

REPAINT [ret]

RESUME [ret]

ROTATE [angle in degrees] :
 COPY [angle in degrees] :

SELECT SPEED [crosshair speed] [ret]
 TEXT HEIGHT [height in inches] [ret]
 WIDTH [width in inches] [ret]
 ON [ret]
 OFF [ret]
 LAYER [new active layer] [ret]
 CIRCLE [number of sides] [ret]
 DEVICE [device number] [ret]
 SCALE [draw scale] = [full scale]

STATUS [ret]

TRANSLATE :
 COPY :

TRIM :
 INTERSECTION :

VERIFY :

ZOOM ALL [ret]
 WINDOW :
 ACROSS :

APPENDIX B

LIBRARY FIGURES

The program disk contains a number of preconstructed figures drawn at a scale of 1"=1'-0". This appendix contains a printout of the figures with their naming conventions. (NOTE: The "PL" in a figure's name indicates a plan or top view.) The figures are shown at 1/4"=1'-0" scale and 0 degrees rotation. The crosshair associated with each figure shows that figure's origin. For example, the 60" tub shown in the first figure has it's origin at the upper right corner. This allows the user to insert the figure using the "End" data modifier and digitizing the rear of the tub enclosure.

The water closet has it's origin centered and 2" to the rear which allows the insertion of the figure, using a data modifier such as "Near", 2" from the wall.

The windows are sized for a 3-1/2" wall (or .292" parallel lines at 1"=1' scale). Windows come in even sizes (ie: in increments of 2") from 16" to 60" wide. For example, to INSert a 30" wide window at 90 degrees rotation on a 1/4"=1'-0" plan type:

```
INS LIB WIN.PL.30 SCA .25 ANG 90 :
```

The disk drive will be accessed while the program checks for the figure and then loads the data. You will then be prompted for a DRAWing LOCation. Digitize a point on the line representing the inside of the wall using one of the data modifiers for exact positioning (The origin of the window is the inner wall side at the center of the window. Using a data modifier such as "Near" will correctly position the sides of the window. Since the location of a window is usually shown as a distance from a wall that is perpendicular to the window, the user can create a

dimension line from the perpendicular wall, using the OFFset command, and use that line to locate the window.).

The doors are sized for a 3-1/2" wall in the same manner as the windows. The doors are even sizes from 18" to 36" wide and are drawn in left hand and right hand configurations.

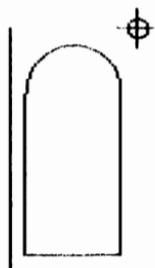
The two compartment sink is sized to fit a 24" wide countertop and is 33" wide. The origin is centered and 1" from the front. This location (of the origin) allows the placing of the sink using the front edge of the counter as the reference.

Also contained are figures representing plan views of common household furnishings such as chairs and sofas. These figures are clearly marked as to type and size in the disk directory.

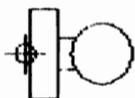
Samples of different types of drawings are included on the disk. The filenames are CHAS.HOUSE.1, SSBN598.NFIG, and CAP.DETAIL. CHAS.HOUSE.1 provides a sample floorplan. As an example of how far in you can go, try Zooming in on the faucets in the half bath. SSBN598.NFIG, which was scaled from a plastic model kit, demonstrates the use of elliptical shapes. There are 5 partial ellipses in the drawing; see if you can find them. The last figure, CAP.DETAIL, provides a perspective view of a column capitol.

To create your own library figures see the LIBrary command.

APPENDIX B



BT.PL.60



WC.PL



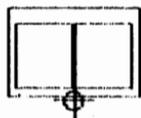
WIN.PL.## where ##=16" to 60"



DR.PL.LH.## where ##=18" to 36"



DR.PL.RH.## where ##=18" to 36"



SINK.PL.DBL

APPENDIX C

PRINTER SETUP

On the second page of this manual is a list of printers which have been successfully used with this program. If your printer is not listed, but is graphics compatible with one of them, particularly the EPSON printers, chances are the program will work with your printer.

The link between your computer and printer is known as an interface. Some printers such as the VIC-1525, the MPS-801, and the Seikosha SP1000VC have their interfaces built in and are thus known as direct connect printers. Most printers, however, will not directly connect to the 128 but support a type of connection known as Centronics Parallel. In order to connect a parallel printer to the computer you will need a SERIAL TO PARALLEL interface. A number of these interfaces are on the market, but the four that I have had personal experience with are the CARD? +G, the GWIZ, the XETEC Super Graphics, and the MW-350. Of the four, the CARD? +G, the GWIZ and the XETEC were the easiest to use. The MW-350 uses power taken from a joystick port for some printers.

If you are using a Star SG-10 or 15, and plan to use high resolution graphics, you need to be aware that the high resolution driver for these printers was written to use the IBM emulation mode which is set with dip switch 2-2 as shown on page 231 of the Star reference manual. Draft prints are made in Star mode.

The following dip switch settings were used successfully on the CITH 8510, EPSON RX-80, EPSON FX-80, and the STAR SG-15 with the Cardco CARD? +G interface. Although I can't guarantee these settings, they should at least get you in the ballpark. Before resetting your switches, however, it would not hurt to try a sample plot with your printer in it's normal

setting. My personal printer, a CITHO 8510, works fine with "HOME DESIGNER" and a number of other programs such as "PAPERCLIP" without changing the dip switches.

For the CITHO 8510 using the Cardco CARD? +G interface, the interface settings are:

dip switch #	1	2	3	4	5	6	7	8
position	o	o	o	o	o	o	o	o
	n	n	f	n	f	n	n	f
			f		f			f

On the CITHO 8510 there are 2 sets of dip switches marked SW1 and SW2. Their settings should be:

SW1

dip switch #	1	2	3	4	5	6	7	8
position	o	c	o	o	o	c	o	c
	p	l	p	p	p	l	p	l
	p	o	p	p	p	o	p	o
	e	s	e	e	e	s	e	s
	n	e	n	n	n	e	n	e
		d				d		d

SW2

dip switch #	1	2	3	4	5	6	7	8
position	c	o	o	o	o	o	c	o
	l	p	p	p	p	p	l	p
	o	p	p	p	p	p	o	p
	s	e	e	e	e	e	s	e
	e	n	n	n	n	n	e	n
	d						d	

On the EPSON and STAR printers, no internal adjustments were made, however, bear in mind the need to use the IBM mode on the Star SG printers for high resolution prints.

On the interface, a Cardco CARD? +G, the switches were

set as follows:

dip switch #	1	2	3	4	5	6	7	8
position	o	o	o	o	o	o	o	o
	n	f	n	n	n	f	n	n
		f				f		

The XETEC interface was tested with the Panasonic KX-P1091i and the EPSON RX-80. For both printers, the switches were set as follows:

dip switch #	1	2	3	4	5	6	7	8
position	o	o	o	o	o	o	o	o
	f	f	f	f	n	n	n	f
	f	f	f	f				f

The direct connect printers (ie: VIC-1525, etc) don't require an interface. The printer driver for the 1525 was included as a possible solution for printers capable (with proper interfacing) of emulating the graphics of the 1525. The driver also works with the MPS-801. If you have a direct connect printer such as the Star NX-10C that is supposed to be Commodore 1525 graphics compatible, but shortens lines in the X axis, try the Seikosha SP1000VC driver.

NOTE: Okidata-120 users; if your printouts are too "heavy", try setting switch 7 on your printer (see Appendix A of your printer manual) to ON (if it isn't already) and configure the program for the Seikosha SP-1000VC as described in Appendix F of this manual. The Okidata 120 uses a double strike method to achieve 120 dots per inch (ie: for every dot mapped, the printer strikes twice giving a "heavy" appearance to the line). With the exception of the command to set the printer into high density mode, the Seikosha SP-1000VC and Okidata 120 drivers are identical.

If the drawing you are working on is fairly complex, such as a 1/4" scale floorplan, half size checkprints will be satisfactory until the drawing is complete.

To get the half size prints, take the default scale of .5 and PASS 1. When you are satisfied with the drawing and are ready for full size prints, obtain a sheet of vellum from your blueprint store (at least 20" X 30") and then try this procedure.

During the printing process, the program is looking at the data and creating a drawing at the scale you selected. A full size 16" X 22" drawing, (scale = 1), is not going to fit on a printer with a maximum width of 8". With a little extra effort, you can make satisfactory full size drawings using the PASS options in the printing sequence. As an example, assume the user selected PASS1 and a scale of 1 for printing. PASS 1 will print the lower half of the drawing at the proper scale. PASS 2 will do the same for the upper half of the drawing. Set your printer to work with friction feed (if you have that option on your printer. If you don't, you will have to print on tractor fed bond). Now print the upper and lower half of the drawing using the PASS options.

Using a razor knife and a good straight edge (such as a framing square), carefully trim the excess paper from one edge of ONE sheet. Align the edges of the drawing and secure using tape on the rear flap of the uncut sheet. (If you are limited to tractor feed, piece your drawing together the same way. Any good blueprint shop should be able to make a vellum positive from your bond original.) The blueprint is then made from the vellum positive. Although a printer will print on mylar, some time is required for the ink to dry.

On wide carriage printers like the STAR SG-15, you have a plot field 13.6 inches wide. An effective technique with this type of printer is to simply center the drawing in the lower 13.6 inches of the drawing area. The LIBRARY command can be used to shift an entire drawing around (See APPENDIX I for a discussion). Print the drawing out at a scale of 1 on

PASS 1, preferably on vellum, and have your blueprint shop center it on a C size bordered format. For those of you who like myself don't need a full C size drawing, I have included a blank 22" wide X 13.6" high drawing format (FORM.C.WIDE.CAR) on your program disk. Using this format, you can build your drawings to fit a wide carriage printer.

APPENDIX D

PLOTTER SETUP

On the third page of this manual is a list of plotters which have been successfully used with this program. Since plotters are not a very common peripheral, I have spent very little time developing drivers for them. The little CBM 1520 is fairly common (as plotters go) and this driver should allow the owners to dust them off and get a bit of use from them. If you have an Hewlett-Packard compatible plotter, the HP 7470A driver should get you going as it was written using a subset of the HP graphics language; Nothing fancy, just a nuts and bolts driver. As time and equipment permits, I plan to add drivers for other plotters.

The link between your computer and plotter is known as an interface. The CBM 1520 alone (to the best of my knowledge) has a built in connection and therefore does not require a separate interface. Most plotters however, will not directly connect to the 128 but support a type of connection known as RS232 Serial (Do not confuse this with the CBM Serial buss. They are NOT the same.). In order to connect a serial plotter to the computer you will need a SERIAL TO PARALLEL interface. The only interface I have used is the Omnitronix CBM serial to RS232 serial interface. (Omnitronix, Inc PO Box 43, Mercer Island, WA 98040, Phone (206) 236-2983) In dealing with interfacing problems, I have had to contact Omnitronix and found their user support to be first rate. Although there are a number of RS232 interfaces available for the USER port, this program does not support them due to a memory conflict.

The HP 7470A had it's DIP switches (located at the rear) set as follows:

2	1		S	4	3	2	1	
S	S	Y	U	B	B	B	B	
			X	X	X	X		1
X	X	X						0

The Omnitronix was configured as follows:

dip switch #	1	2	3	4	5	6	7	8
position	o	o	o	o	o	o	o	o
	n	f	f	n	n	f	f	f
		f	f			f	f	f

These settings correspond to a BAUD RATE of 2400, 8 bit word with no parity, device #4, no linefeeds, and DTR (otherwise known as hardware) handshaking.

APPENDIX E

DATA STRUCTURE

This appendix is provided for those users who have a properly interfaced plotter other than those already supported. If you write a plotter driver that you are willing to share with other users, send me a copy of the source code and documentation (including interfacing details) and it will be included on future releases (with authorship acknowledged if desired) and available to current owners. We cannot provide any royalties or reimbursement.

The data is stored in the form of a sequential file. There are three types of data. The first type is line data, the second is circular data, and the third type is for text. Each data type has it's own structure and to keep it straight, the program uses a series of pointers. The first value in the drawing file is an integer (maximum value = 7) indicating which types of data are contained within the file. If the result of this integer AND 1 is true, then the file contains line data. If the result of this integer AND 2 is true, then the file contains circle data. If the result of this integer AND 4 is true, then the file contains text data. Using this integer, the program knows which types of data to look for. The data blocks are stored in the sequence LINE, CIRCLE, and TEXT. The first 5 values (integers) of each block indicates the number of entities of that type on each layer plus 1. For example, if the first six integers of a file were 1, 5, 1, 1, 1, and 1 then the first number, a 1, would indicate that only line entities were present and no circles or text. The remaining five numbers, 5,1,1,1,1 would indicate that the file contained 4 line entities on the first layer and none on layers 2 thru 5.

All line data is stored in integer format. Each line has four values in the form of X1 Y1 X2 Y2. The real

number represented by these values can be obtained by dividing each value by 1000. (ie: 2.578 is stored as 2578)

The second block, circular figures, the first five values are stored in integer format and indicate the number of values stored on each layer. Each circle is allocated eight (all in integer format as is line data) values arranged as follows:

1st value....X coordinate
2nd value....Y coordinate
3rd value....X axis (see **CHAnge PARAmeter** command)
4th value....Y axis (see **CHAnge PARAmeter** command)
5th value....starting angle in radians
6th value....ending angle in radians
7th value....angle of rotation (for ellipses only)
8th value....set to a value of 4 for rectangular figures. Set to 0 for all others.

In the final block, text, the first five values (again stored in integer format) indicate the number of values stored on each layer. The data for each entry is stored as follows:

1stX coordinate (integer, divide by 1000)
2ndY coordinate (integer, divide by 1000)
3rdReserved for font designator
4thText height (integer, divide by 1000)
5thText width (integer, divide by 1000)
6thText angle (real, positive counterclockwise)
7thText string

APPENDIX F

CONFIGURE

The CONFIGURE module accessed from the Main Menu creates a file called the EXECUTIVE. This file is read by the program, and among other things, defines the printer you are using, the width of your graphics screen, and the allocation of your disk drives if you are using two drives. To use the module, select option 5 on the Main Menu (For your own protection, configure your backup copy and not your original program disk. The program disk is unprotected, but if you are using the copy utilities that came with the 1571 disk drive, see Appendix H.) The first choice presented will ask you whether you want to create a new EXECUTIVE file or rework an old one. If you choose to rework an old one, the existing EXECUTIVE file will be read from the disk. If you choose to create a new file, the default settings will be read. After your selection has been performed, the program settings will be displayed.

If you want to make any changes, answer "Y" to the prompt and you will be asked to select a number corresponding to the parameter you wish to change.

The first parameter concerns the selection of a printer driver. The program will display a list of printers with the first one highlighted. Using your cursor keys, select the your printer and press:

[ret]

The program will respond by asking if you are sure of your selection. If you are satisfied, press:

Y

You will return to the settings display screen with the new printer shown. Again you have the option of accepting the settings or changing them. Lets assume

you want to change all of them and step through them one by one.

The second settings identifies your plotter. If you don't have a plotter, then ignore it. Otherwise proceed in the same fashion as you did with the printer selection.

The third parameter concerns the aspect ratio of the display. If you select this, the screen will clear and you will be asked to select a screen display ratio. Depending on the monitor or TV you are using, some correction factor may be needed to minimize horizontal distortion. This distortion makes horizontal lines look shorter than vertical lines of equal length. Perhaps an easier way to visualize this phenomena is to picture a circle that on some monitors appears round and on others appears egg shaped. This screen distortion will not affect your printer output. Number 1 will select a ratio of 1 to 1. This ratio works quite well with monitors having a 40/80 column display setting such as the Zenith ZVM 121. Number 2 selects a ratio of 1.25 to 1. This is the maximum allowable ratio and also works quite well with monitors like the Commodore CM 141. If you select number 3, you will be prompted for some value between the two extremes.

Unless you have a monitor with a 40/80 column setting, try the 1.25 to 1 ratio first. If, after running the program, your image is distorted (circles appear stretched horizontally), rerun the CONFIGURE module and try a smaller number using option 3.

When you have returned to the settings display screen, the new screen ratio will be shown. This now brings us to the last two selections which are only of concern to the user with two disk drives. Library figures are best stored on a disk separate from the disk you use to store your drawings. If you are using two drives, you can specify one drive for library

figures and one for drawing files. The drive designated for Library Figures will be a "Read Only" drive. The FILE command will only access the other drive. You may toggle between the directories with the **SElect DEvice** command. Bear in mind, the program disk (or your copy of it) must be in drive #8. For this reason, the best setting is usually for drive #8 to contain the program disk with it's library figures and drive #9 to contain your drawing data disk.

The final two selections are used to define the screen colors. As you make your selections, the display colors will change.

When you have completed your changes, you will be given the opportunity to save your changes. If you answer Yes, the new EXECUTIVE file will be written to disk, and you will then be returned to the Main Menu.

APPENDIX G

KEY DEFINITIONS

The eight function keys on the upper right corner of your keyboard are recognised by "HOME DESIGNER". The keys are predefined as follows:

F1	INS LIN :	F2	INS ARC :
F3	DIR	F4	STATUS
F5	INS LIN HOR :	F6	INS LIN HOR LEN
F7	INS LIN VER :	F8	INS LIN VER LEN

The key definitions are stored on a file on the program disk called "KEY". To redefine the keys, turn on your computer and disk drive (without the program disk in the drive). Type:

KEY [ret]

The computer will provide you with a list of the default key settings. Edit the keys to your satisfaction ,insert your backup disk (see APPENDIX F) and then type:

BSAVE"KEY",B0, P4096 TO P4352 [ret]

The disk drive will be accessed and the new key definitions stored. To edit your selections, place the disk in the drive and type:

BLOAD"KEY" [ret]

The definitions will be restored and can be edited with the KEY command as discussed above. You can then resave your new definitions.

APPENDIX H

7.0 DOS COMMANDS

This appendix is provided as a service to new users of Commodore equipment and not as any replacement for the disk drive manual. If you don't feel inclined to wade through the manual, this appendix will get you going. Please note that these examples assume your disk drive is device # 8.

FORMATTING A DISK: In order to save any kind of data to disk, the disk must be formatted. Virtually every new user, myself included, seems to be unaware of this basic fact of computing. To format a disk, insert a blank disk into the disk drive and close the door on the drive. The syntax for the command is:

```
HEADER"DISKNAME",I##
```

DISKNAME can be anything you wish to call the disk up to 16 characters. The ID (represented by ## after the letter 'I') can be virtually any two alpha numeric characters, such as J1 or 34. Be sure to put the comma between the diskname and the ID. **WARNING:** This command will destroy everything on the disk so be certain that the disk is blank before formatting it (see the section on disk directories). The formatting procedure takes several minutes in a 1541, so, if your disk already has been used, you can save time by reformatting the BAM which only takes a few seconds. Type:

```
HEADER"DISKNAME" [ret]
```

The only difference between this command and the first one is that the ID has been omitted.

As an example :

```
HEADER"SAMPLE",I34
```

where 34 represents the disk ID as already discussed.

If the disk has already been used, type:

```
HEADER"SAMPLE" [ret]
```

and the disk will be reformatted in seconds.

SAVING A PROGRAM: In order to save a BASIC program, insert a formatted (see above) disk into the disk drive and close the door. Make sure that the write protect notch on the left side of the disk is uncovered. The syntax is:

```
DSAVE"FILENAME" [ret]
```

where FILENAME is any name you care to give your program.

LOADING A PROGRAM: To load a program from disk type:

```
DLOAD"FILENAME" [ret]
```

where FILENAME is the name of the program you wish to load. The command DLOAD specifies a disk drive and the default device number is 8. Some programs, usually machine language, have to be loaded into the section of memory from which they came. The command for this is:

```
BLOAD"FILENAME" [ret]
```

If you can't remember your program name, you can list the disk directory and load directly from it. Type :

```
DIRECTORY [ret]
```

or press F3.

The disk drive will whirl and then the screen will

display the contents of the disk. If you want to slow or stop the listing use the NO SCROLL key at the top of the keyboard. To abort the command press the RUN STOP key. The list of all files on the disk will be displayed in the following format:

```
#      "FILENAME"      FILETYPE
```

where # represents the number of blocks occupied by the file, "FILENAME" is the name of the filename, and FILETYPE is the type of file such as PRG, SEQ, and USR. To load a BASIC program from the disk directory first move the cursor to cover the number representing the number of blocks and type DLOAD. Then use the cursor controls or the TAB key, not the space bar, to move the cursor to the right side of the filename and then use the spacebar to erase the filetype designator. After the program is loaded, move the cursor below the disk directory and then type RUN and press [ret].

SCRATCHING A FILE: To scratch or erase a file from the disk type:

```
SCRATCH"FILENAME" [ret]
```

FILENAME, as before, refers to the name of the file you wish to erase.

RESAVING A PROGRAM: If you want to save an updated version of a program and use the same name, first scratch the file on the disk and then save the updated version (you could play it safe by saving the new version under a temporary name, scratching the old and then renaming the new). Commodore DOS supports a SAVE WITH REPLACE command, (see disk manual), but a number of users have had problems using it, read that as lost files, so I do not recommend it.

As stated, Home Designer not copy protected, however several users have tried unsuccessfully to copy the disk using the DOS Shell file copy utilities included with the 1571 disk drive. If you don't have access to a commercial or good public domain file copier, you can, with a bit of effort, use one of the C64 copy utilities on the 1571 disk. In general, to make a 1571 format copy of the program side of the disk (put library figures on a separate disk) requires 3 steps:

A. Format a new disk as follows:

```
HEADER"BACKUP",1B1
```

This command will completely erase the disk, so be sure to use a blank disk or one with no data you wish to save.

B. Use the Autoboot maker included on the 1571 disk to create an autoboot sector on the newly formatted disk. When the Autoboot maker program asks for the name of the program to boot, type:

```
HOME DESIGNER
```

When the Autoboot maker program asks for the type of program take the default answer of BASIC.

C. Go to 64 mode and use the utility named SD.COPY.C64 to actually copy the files. NOTE: In 64 mode you will need to use DOS 2.0 commands such as:

```
LOAD"SD.COPY.C64",8,1 [ret]
```

Again, a good file copier, such as FAST HACKEM, will do the file transfers much more easily, but in a pinch the SD.COPY.C64 will work.

APPENDIX I

HINTS & TIPS

1. Under most conditions the ESC key located at the upper left corner of the keyboard will bail you out of a command.
2. In constructing complex figures, speed becomes the primary constraint. To speed things up try:
 - A. Turn off text. Even with text turned off, it (the text) will be visible until the graphics are repainted.
 - B. Select circles to have less than 16 sides. Eight sides is an adequate representation for most applications. This will not affect your hardcopy.
 - C. Turn off unneeded layers.
 - D. Use the ZOOM ACROSS command to move around where practical. This saves regenerating graphics twice when you ZOOM ALL and then ZOOM WINDOW.
 - E. Build your framework and insert your library figures last. Complex figures can increase the entity count quite rapidly with a corresponding loss of speed.
3. If you start a drawing and find out it is off center, you can shift the whole drawing around with the LIBRARY command. Decide where you want your new XOYO to be, and feed the program those coordinates with the LIBRARY command. When you REPAINT the drawing you will see it has been relocated.
4. When in doubt, look it up in the index, particularly if something doesn't seem to be working properly.

APPENDIX J

SCALED UNITS

"HOME DESIGNER"'s work area simulates a sheet of paper 16" high X 22" long. If you were working on a drafting table, you would have certain basic tools to allow you to create a precise and accurate drawing. Since we can't use physical tools to make our drawing, we will need software tools to simulate them.

One of the most basic tools is the T-Square which is used to draw horizontal lines, and in conjunction with a 90 degree angle, draw vertical lines. These tools are represented by the INSERT LINE HORIZONTAL and INSERT LINE VERTICAL commands. Other tools such as the compass (INSERT CIRCLE or INSERT ARC) and parallel bars (OFFSET) are also simulated by our software tools; In fact, almost every common drafting tool has it's counterpart in "HOME DESIGNER". "HOME DESIGNER" also provides tools and capabilities unlike anything possible on a manual drafting table.

One of the program's more interesting tools, and the main focus of this appendix, is it's ability to use scaled English Units to simulate the Architects Scale. The next paragraph is for the benefit of those not familiar with architectural scales and may be skipped by more advanced users.

The architectural scale is a special kind of ruler, usually three sided, that measures distances (or lines) in special units that represent feet. These units vary in length from $3/32$ " to 3" and are referred to as the "scale" of the drawing. In practice, a drawing using $1/4$ " = 1' scale (the most common) would represent 4' with a 1" line.

As mentioned above, "HOME DESIGNER"'s work area represents a 16" X 22" sheet of paper. Objects (such as lines) placed on this drawing area are located in the database by a set of absolute coordinates representing their XY location in inches on the drawing. X0Y0 is located in the lower left corner of

the drawing. X increases to the right and Y increases vertically and up. The upper right corner represents X22Y16. While inserting certain objects (parallel lines with the OFFSET command, horizontal and vertical lines with a specified length, and circles), the user has the option of using absolute units, ie inches, or scaled units. The program differentiates between the two types of units based upon the form of the dimension. For example, a line inserted thus:

INSert LINE HORizontal LENGth 4 :

would be drawn 4 inches long. The same command typed:

INSert LINE HORizontal LENGth 4' :

with the scale set at $1/4" = 1'$ would be only 1 inch long. For scaled units, the program recognises the characters ' " / and -. Thus, a dimension of eight feet seven and three quarters inches can be written 8'7-3/4". Decimal representations are allowed so the previous example could have been written 8'7.75". Fractions of a foot are allowed such as 8.5' which represents eight feet six inches.

APPENDIX K

TEXT MERGING

The "HOME DESIGNER" disk contains a short BASIC utility called TMERG which will read a file from Paperclip (and probably other word processors that can create a SEQ file) and create a file called XFER that can be inserted into a drawing a library figure. If you have a large amount of text to place in a drawing, editing with a word processor can save a good deal of time. To use this utility, first create your file with the wordprocessor. Each line must be ended with a carriage return. I also add a single blank space before the carriage return. Blank lines consist of a shifted space and a blank space followed by a carriage return. Save the text a Sequential file, return to BASIC (i.e. bail out of the wordprocessor) and load the program TMERG. If you LIST the program you will see REM statements identifying the variables declared on lines 190 thru 260 (see Appendix E). The program defaults to .1" high X .1" wide characters as declared on line 220 with a line spacing of 1.5 X character height. For most applications, line 220 is the only one you might need to change. Keep in mind the amount of text space available in the main program. If you create a file that is too large, it won't fit in a HOME DESIGNER database. Also remember that library figures are inserted into the active layer, so you cannot have more than 100 lines.

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