

GRAPH/NET Computer-Integrated Design System

DRAFT/NET 2-D Drafting Program

Version Ela

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## DRAFT/NET 2-D Drafting Program

This manual describes the DRAFT/NET 2-D Drafting Program, an integral part of the GRAPH/NET Computer-Integrated Design System. The current release of that program is Ela. This manual is divided into three sections:

**New Options:** This section describes the commands and capabilities that have been added since the previous release (D1.6) of the DRAFT program. This section should be read by all users, since it highlights the modifications.

**Quick Reference:** This section provides a fast review and reference point for experienced users who need to look up a seldom-used command or new option. This section may be used by all users once they have acquired a basic grasp of the DRAFT program. If the Quick Reference section does not provide sufficient information, please refer to the Detailed Discussion of the same command.

**Detailed Discussion:** This section gives a step-by-step explanation of each command, and is primarily intended for beginning users, users who have not been using the GRAPH/NET System for a while, or users who have forgotten how a particular command works.

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## New Options

Some new options have been added to the DRAFT program in the Ela release. Other commands have been modified substantially to add new capabilities. The table below shows these commands, and their location in the Master Menu. A detailed discussion of each follows.

### MASTER MENU

#### \*\*\*\*\*CREATE\*\*\*\*\*

p Parallel Lines

#### \*\*\*\*\*MODIFY\*\*\*\*\*

| Cut

#### \*\*\*\*\*SET\*\*\*\*\*

~ Drawing Marks

#### \*\*\*\*\*DISPLAY\*\*\*\*\*

v Layers

] Dimensions

#### \*\*INPUT/OUTPUT\*\*

I Input File

o Store File

O Plot File

3 VIL File

[ Picture File

h Hardcopy

#### \*\*\*\*\*SUPPORT\*\*\*\*\*

k Miscellaneous

p Parallel Lines

This command has been changed so that whenever you are drawing a series of parallel lines, the corners will snap closed automatically. This will occur regardless of whether you are drawing lines that are constrained to be vertical/horizontal, or generic lines. In certain situations, however, where the DRAFT program is not certain whether you meant the lines to continue or not, it will not close the corner.

| Cut

The Cut command has been changed so that it no longer drops a pixel from the item being cut. This means that you will no longer see a small white space where you have made the cut, and also means that those of you using Cut to put doors in walls, for instance, will be able to use Sticky Edit without editing the lines to fit.

~ Drawing Marks

The ability to specify a particular mark to move to has been added to this command. Now, when you select Mark Center from the pop-up menu, a message will appear in the lower left corner of the screen stating that "This drawing mark has been assigned the number XX". When you select Go To Mark, a further pop-up menu will appear listing the numbers of all marks on the drawing. Simply select the number of the one you want to go to. Note that when you delete a mark, its number disappears from the pop-up menu of available marks, but the other marks are NOT renumbered.

v Layers

The Delete Layer option in the Layer menu has been changed. Now when you select this option, a pop-up menu of the layer names will appear on the screen. Select as many layer names as you wish to delete, by tapping them with the pointer. When all layers to be deleted are shown in reverse video, position the pointer over the X in the lower right corner of the pop-up menu, which will result in a large exclamation point appearing on the screen, and press the yellow button. If you press the button outside the X, the DRAFT program will assume you have changed your mind and don't wish to delete the layers. Note that only empty layers which are not current can be deleted.

## ] Dimensions

The Dimensions command is a new addition to the Master Menu. It allows you to automatically dimension selected portions of your drawings. Prior to selecting this command, you may choose to set a variety of parameters using the Auto Dimension Options line in the 'k' Miscellaneous Commands menu.

To dimension a drawing, tap the yellow button at the point you would like to dimension from, then tap it again at the point you would like to dimension to. You can continue tapping the yellow button until you reach the last point you wish to dimension to. Small black squares will appear on the screen to indicate the points you have picked. If you make a mistake selecting a point, tap the white button to clear, and start over. When you have finished, tap the green button with the pointer at the distance where you would like the dimension line to appear. Immediately after you tap the green button, the dimension string will be created.

## I Input Drawing

Due to the new binary output option discussed below, you will notice that the pop-up file menus now contain .DP files, .DPA files and .DPB files. The .DP files are files created under versions of DRAFT up to and including D1.6. The .DPA and .DPB files are those created under versions E1a and subsequent. DPA stands for Draft Program Ascii, and DPB stands for Draft Program Binary. A .DP file and a .DPA file are essentially the same. Binary files will read in from disk much faster than ascii files.

If you wish to type in a filename instead of using the pop-up menu, you now must specify either .DP, .DPA or .DPB.

You will notice that a visual progress indicator has been added, to indicate status of input of a file. The indicator will be slightly inaccurate for .DP files.

Finally, if you already have a drawing on the screen, and you try to superimpose a second one, the number of layers will be checked. If it would exceed 50, an error message will be displayed, and the command ignored. If you have deleted the first drawing, you may use the new Delete Layer command in the Layer menu, see above, to quickly delete the unwanted layers, and then read in the second file.

o Store Drawing

The default storage mode in version Ela is 'binary', as compared to the 'ascii' or user-readable file storage mode used in previous releases. The binary format is more compact, reducing the time required to store the file and the space required on disk. However, the binary files cannot be edited by the user.

To store a file in ascii format, you must type the '.DPA' at the end of the filename.

A visual progress indicator has also been added, to indicate the status of the storage of the file.

O Plot Drawing

Changes have been made affecting those with Hewlett-Packard plotters or Versatec electrostatic plotters.

For H-P users, the spacing of dot, dash and dot-dash lines has been changed to more closely conform to the screen image. To do this, control of the spacing was taken by DRAFT from the plotter, so there is a small increase in plot time. In addition, H-P users can now use the rotation button on their plotters to rotate the drawing 90 degrees.

For Versatec users, the ability to interface with the fileserver over the RS-232 line in addition to by floppy was added. This results in faster plot times, and less congestion on the GRAPH/NET units. After selecting the O Plot option, you will now see a pop-up menu with the choice of 'Output to Plotter' or 'Output to File'. Output to Plotter sends the file directly to the fileserver; whereas Output to File stores the file on disk for later transfer to a floppy.

3 VIL File Creation

Two changes have been made to the VIL command. First, you can now convert splines into VIL files, and you can specify the number of pieces for the spline in the same manner as you specify the number of circle segments. Second, there are now two ways to specify the center origin point of a VIL file. You may continue to specify it yourself, by tapping the yellow button at the desired point, or the DRAFT program will assign the center of the drawing to automatically be the center point. You must indicate which of these two options you wish to use in the 'k' Miscellaneous Commands menu before creating your VIL files. In addition, should you choose to specify the center yourself, the pointer will now move at whatever mouse grid is set, assisting you to tap the same point each time.

[ Picture Files

A new option has been added to the Picture File menu: Show Sequence File. If you have created a series of picture files, you may choose to view them sequentially, instead of reading them in one at a time. To do this, you must first create a sequence file. Then, each picture will be displayed in the order specified in the sequence file. All picture files are now centered on the screen, as well.

h Hardcopy

The screen is now automatically scaled to the scale necessary to produce properly scaled output on either the dot matrix printer or the laser printers. This will occur when the screen refreshes to remove the border. After the copy is made, the screen will be returned to the original scale.

k Miscellaneous Commands

Two new options have been added to the bottom of the k menu: Auto Dimension Options, and Center 3D Yes/No. Selection of the Auto Dimension Options command allows you to select the desired options for the Dimension command discussed above. The following pop-up menu will appear:

- Text Font
- Indicator Type
- Dimension Line Parameters
- Witness Line Parameters
- Indicator Line Parameters

Selection of any of these will result in a further pop-up menu of choices.

Selection of Text Font will produce a menu of available fonts, identical to the menu you would see if you selected the 'f' Font command. Simply tap the desired font, or enter a new one.

Selection of Indicator Type will produce the following pop-up menu:

- None
- Slash
- Arrowhead
- Circle

Tap the desired indicator type; the default is slash.

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Selection of the final three options will produce the Line Type pop-up menu. Simply select the desired line thickness or style for either the dimension lines, witness lines, or indicator types.

Tapping the Center 3D Files option will toggle you between YES and NO. When Center 3D is set to YES, you will be asked to specify the center point. When Center 3D is set to NO, the DRAFT program will automatically specify the center point. The default is NO.

There have been a couple of other changes to items already in the Miscellaneous Command menu.

CKP\$ files are no longer created. The creation of the Checkpoint files is unchanged, but the older checkpoint file will simply be erased when the new one is created. This will cut down on disk utilization, especially by those of you working with very large file sizes. Also, CKP files are now binary.

Metric files now are measured in millimeters, instead of centimeters. The only two unit types currently available therefore are inches and millimeters.

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### Quick Reference

The following paragraphs summarize in very concise form the various commands in the DRAFT program. This section is intended for use by the experienced user; first-time users should proceed to the Detailed Discussion section.

Command	Key	Button	Action
<b>** CREATE **</b>			
Line	l	Yellow	Hold down to draw horiz/vertical lines
		White	Hold down to draw lines at any angle
		Green	Hold down to draw lines at any angle
Parallel Line	p	Yellow	Hold down to draw hor/ver parallel line
		White	Hold down to draw generic parallel line
		Green	Separation choice
Rectangle	L	Any	Hold down to draw rectangle
Circle/Arc	O	Yellow	Hold down to drawn circle
		White	Same as Yellow
		Green	Tap 3 times in CCW direction to indicate start, end & center of arc
Spline	9	Yellow	Tap at each point of spline (dot appears)
		White	Same as Yellow
		Green	Tap when finished giving points
Text	a	Yellow	Tap where text to start, type single line hit return to end text string
		White	Same as Yellow
		Green	Tap where text to start, type several lines, hit extra return to end text string
Bundle	b	Yellow	Tap the One Item to be bundled, type name
		White	Draw Rectangle around items to be bundled
		Green	Selected Items will be bundled, type name
UnBundle	B	Yellow	Tap the One Item to be un-bundled
		White	Draw rectangle around the items to be un-bundled
		Green	Selected items will be un-bundled

Quick Reference, Cont.

Area Fill	8	Yellow White Green	Tap Corner Point of Area Same as Yellow Close Area, Black Tone will appear on screen
*** MODIFY ***			
Move	m	Yellow White Green	Move One Item tapped Move Items in Rectangle Move all Selected Items
Copy	c	Yellow White Green	Copy One Item tapped Copy Items in Rectangle Copy all Selected Items
Multiple Copy	C	Yellow White Green	Make Multiple Copies of Item tapped Make Multiple Copies of Items in Rectangle Make Multiple Copies of all Selected Items
Edit	e	Yellow White Green	Edit H/V lines & radii of circles, text, drag points of splines Edit Generic Lines Edit Generic Lines, sweep of circles, display and close points of splines
Sticky Edit	x	Any	Drag lines or symbols
Change Symbol	t	Yellow White Green	Make selected transformation of One Item tapped Make selected transformation of Item in Rectangle Make selected transformation of Selected Items
New Parameters	n	Yellow White Green	Change line Parameter, Font, Layer or Color of One Item tapped Change Line Parameter, Font, Layer or Color of Items in Rectangle Change Line Parameter, Font, Layer or Color of Selected Items
Cut	:	Yellow White Green	Cut Items on Line Cut Items in Rectangle Cut Selected Items on Line
Delete	d	Yellow White Green	Delete One Item tapped Delete Items in Rectangle Delete Selected Items
UnDelete	u	Yellow	Restore previously deleted items

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Quick Reference, Cont.

\*\*\*\* SET \*\*\*\*

Scale	=		Select typical or specified scale from menu
Line Parameters	-		Select thickness & type from menu
Font	f		Select font from menu; add new font
Set Mouse Grid	g		Loop through mouse grids to next in series
Change Grid	#		Add, Delete or Change mouse grids
Drawing Marks	~		Insert, Delete or Go To invisible marks

\*\*\* DISPLAY \*\*\*

Layers	v		Display Layer Menu
Magnify	M	Yellow	No impact
		White	Increase the degree of magnification
		Green	Decrease the degree of magnification
Measurements	A	Yellow	Measure the distance between subsequent taps and close an area to be measured
		White	Clear previous measurements
		Green	Tap the corners of an area to be measured
Dimensions	]	Yellow	Tap the start of witness lines
		White	Clear previous taps
		Green	Tap the location of the dimension line
Screen Grid	'		Turns screen grid off and on with subsequent taps
Window	w	Yellow	Pan the drawing only
		White	Pan both drawing and picture file
		Green	Pan the picture file only
Refresh Window	r		Redraw the window image

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## Quick Reference, Cont.

### \*INPUT/OUTPUT\*

Input DP File	I		Read in a DRAFT Program (DP) file
Input Symbol	i		Read in a single symbol from a DP file
Input Text File	j		Read in a text file in the current font
Input CMD file	@		Repeat macro-commands stored in transcript file
Picture file	[		Display a raster file created in another program
Store DP file	o		Store the current drawing on hard disk
3D View Create	3		Create 3D files for display in VU
Hard Copy	h		Make the selected number of screen dumps
Plot Drawing	O		Make a Plot or a Plot file

### \*\*\* SUPPORT \*\*\*

Select	s	Yellow White Green	Select the One Item tapped Select the Items in a Rectangle Select All Items
DeSelect	z	Yellow White Green	DeSelect the One Item tapped DeSelect the Items in a Rectangle DeSelect All Items
Misc Cmd Menu	k		Change the Checkpoint Value, Display Grid, Gravity, and Range Display in Black Mode, Display Dimensions in Cursor, Pins Select Dimension Options, Select 3D Center
Transcript	\$		Make a Command File; Close a Command File
Help	H		Display the On-Line Help Files on the screen
Parts List	?		Display the symbol list on the screen
Quit	q		Exit from the DRAFT program

## DRAFT/NET 2-D Drafting Program

### Detailed Discussion

DRAFT/NET is an easy-to-use yet extremely powerful, layered drafting program designed to complement the way architects, designers and planners think and work. Its screen menu system is very tutorial, using commonsense English-language commands to facilitate learning the system. Its alternate keyboard command system allows experienced users that are comfortable with a keyboard to become even faster and more productive.

The first-time user will find it advantageous to sit at the GRAPH/NET workstation and practice the various commands as he reads about them. At this stage, you should not focus on learning the keyboard commands, even if you think that you will eventually want to use the keyboard system. As you use the DRAFT program further, you will start to learn the keyboard commands without even trying, since most of them are the first letter of the command word: 'm' for move, 'c' for copy, and so on.

This section is arranged in the same order as the commands appear in the screen Master Menu. This means that commands that CREATE items and symbols are first, followed by commands that MODIFY them, commands that let you SET various parameters, commands affecting the DISPLAY of files, commands impacting INPUT and OUTPUT of files, and SUPPORT commands.

## Starting the Program

To start the DRAFT/NET program running, first make sure that you are working in the DRAFTNET area of the disk. Most GRAPH/NET Systems default to this area when you log in. Some systems do not do so, in which case you must set the path to this area. Do this by using the DIRTREE utility. See the Utility Programs section of this Manual.

Certain GRAPH/NET Systems that license ONLY the DRAFT software will have several DRAFT partitions on the disk, instead of the more usual DRAFTNET, OPTINET, and VUNET partitions. In this instance, set the path to whichever of the DRAFT partitions you wish to work in.

Then, execute the program by typing  
DRAFT

There will be a short pause while the computer calls up the program, and then you will see the screen clear, and the DRAFT/NET program title window will appear on the screen. This will then disappear, and you will see the typical DRAFT window configuration.

If the program does not run when you type in DRAFT, go back to DIRTREE and make sure you set the path to the DRAFTNET area by placing the "tree" cursor over the DRAFTNET box and pressing the yellow button on the puck. If you did, and it still will not run, call your systems manager, or your GHI representative.

Looking at the screen now, there are several points to notice.

First, there is a black border around the outside edge of the viewing area. This delimits that space that you have to work in. All of the commands that you execute will occur inside this border. Should you move the puck so that the cursor moves outside this area, the cursor will freeze.

Second, there are two long white pockets on the left and right side of the screen. Placing the pointer in either of these and pressing down the yellow button will result in the appearance of the Master Menu on the screen. The Master Menu may also be called up by hitting the Space Bar on the keyboard. (The small white pockets in the center of the top and bottom borders of the screen will also call up the Master Menu, but in truncated form, and you will have to scroll through the menu to reach all of the commands. Therefore, it is recommended that you use either the pockets on the left or right side, or the Space Bar.)

Starting the Program, Cont.

Third, there are two slightly longer white pockets in the top border of the viewing area. The one on the left is used to display distances and angles, while the one on the right is used to display areas.

Fourth, there is a white pocket in the lower right corner of the screen, in which the current display grid, mouse grid, scale, mode and layer are displayed.

Finally, the name of the current drawing, when there is one on the screen, is displayed in the lower left window border.

Now call up the Master Menu on the screen. To make a selection from this or any other pop-up menu, just slide the puck up and down until the black bar moves over the desired option, and then tap and release the yellow button.

\*\*\* CREATE \*\*\*

## 1 LINE

To draw a line on the screen, select the Line command from the Master Menu, or type '1' on the keyboard. This is the default command that the DRAFT program starts you off in when you first run it. You can now draw two types of lines on the screen, depending on which button on the puck you use.

To draw lines constrained to be horizontal, vertical or 45 degrees, press the yellow button, and, while holding the button down, move the puck. The line will follow the puck, and will be released when you release the button. You will see that the line you draw is always either horizontal, vertical or at a 45 degree angle, regardless of where you move your hand. Notice that as you make the line longer or shorter, the corresponding length is displayed in the distance pocket of the upper window border. The number to the right of the distance is the angle at which the line is drawn. A horizontal line drawn from left to right has an angle of 0, a vertical line drawn from bottom to top has an angle of 90 degrees, and so forth. When you have released the button and finished drawing the line, you may add the dimension and/or angle to the drawing if you wish. To do this, move the puck until the pointer is positioned directly over the number, hold down the yellow button on the puck, and slide the number into the desired position. Then release the button.

You may draw lines which are not constrained to be horizontal or vertical by using the green or white buttons on the puck. Move the pointer to the position where you want the line to start, press down the button, hold it down and slide the pointer to the position where you want the line to end. You will see the line appear on the screen. These lines will go at any angle. Notice that as you make the line longer or shorter, the length of the line and the angle at which it is drawn are displayed in the distance pocket, in the upper left side of the grey window border. You may add dimension and angle information to the drawing, by moving the puck until the pointer is positioned over the number, holding down the yellow button, and sliding the number to the desired position in the drawing.

Both types of lines will move in increments depending on the Snap Grid that is set at the time. Their origins will also be set on that Grid. Therefore, if you have been working in a grid of 18, and you switch to a grid of 12, you may no longer be able to make lines meet. If this happens, check the grid you are working at, which is displayed in the lower right corner of the window, and change it using the Grid function.

p Parallel Line

The Parallel Line command allows you to draw parallel lines, such as double line walls, using one command only. These lines can be drawn at any user specified spacing. The user moves the pointer such that it specifies the endpoints of one of the pair of lines and the second parallel line is drawn so that the endpoints line up perpendicularly. Once the lines are drawn, they become two separate lines.

To use this command, either select Parallel Line from the screen Master Menu, or type 'p' on the keyboard. Use the white button for generic parallel lines and the yellow button for horizontal or vertical parallel lines. The green button allows the user a choice of separation as well as a user specified option. Place the black bar over the desired spacing and tap the yellow button. If you choose user-specified, simply enter the separation value desired.

Once the separation has been determined, parallel lines are drawn in the same way as single lines.

If you are drawing a series of parallel lines, the DRAFT program will cause the corners to snap closed automatically. This will occur regardless of whether you are drawing lines that are constrained to be vertical/horizontal, or you are drawing generic angled lines. In certain situations, however, where the DRAFT program is confused as to whether you meant the lines to continue or not, it will not close a corner.

## L RECTANGLE

To draw a rectangle on the screen, select the Rectangle option from the Master Menu or type an 'L' on the keyboard. Then, press down the yellow button at one of the corner points of the desired rectangle. Holding the button down, slide the puck over to the opposite corner point, and then release the button. Note that until you have moved the puck to a point such that the rectangle has both width and depth, nothing will appear on the screen.

Once you have released the button, and the rectangle is on the screen, it is no longer a single item. Rather from this point on, it is four distinct lines, each of which may be modified, deleted and so forth. If you wish to continue to move the rectangle around on the screen as a single item, you will have to bundle it into a symbol. (See the description of the Bundle command below.)

You will see the width and depth of the sides of the rectangle displayed in the distance pocket, and the area enclosed by the rectangle in the area pocket. Any of these numbers may be added to the drawing itself. Just move the puck until the pointer is directly over the desired number. Then hold down the yellow button, and slide the number into the drawing. When you release the button, the number will be fixed in that position.

O CIRCLE, ARC

To draw a circle or an arc, select the Circle/Arc command from the Master Menu, or hit the "O" key on the keyboard. The yellow and white buttons on the puck will produce circles, whereas the green button is used to draw arcs.

To draw a circle, position the pointer on the screen at the spot where you wish the center of the circle to be. Press down the yellow or white button, and hold it down while you move the puck away from the center of the circle. The circle will be drawn on the screen, getting larger the further you move the puck away from the point you designated as the center of the circle, and getting smaller if you move the puck closer. When you release the button, the circle will stay that size on the screen.

Notice that as you draw a circle, the diameter of the circle is displayed on the screen in the white pocket in the upper left side of the grey window border, while the area enclosed by the circle is displayed in the right side of the grey border. To bring any of these numbers onto the drawing, simply slide the puck up so that the pointer is directly over the number, hold down the yellow button, and slide the number to the desired position.

To draw an arc, you must tap the green button three times. The first time, you are indicating the point at which the arc is to start. The second tap indicates the point at which the arc is to end. The third and final tap indicates the center of the circle along whose circumference the arc lies. When you release the button after the third tap, the arc will be drawn on the screen.

Arcs are ALWAYS drawn COUNTER-CLOCKWISE. Therefore you can get a small arc, or an entire circle minus that small arc, by reversing the order in which you press the first and second points.

Notice that the diameter of the circle on which the arc would lie is displayed in the distance pocket of the window border, along with the exact number of degrees swept out by the arc. The area that the arc would contain if it were a slice of pie is shown in the area pocket.

9 SPLINE

To draw a curve that is smoothed between a series of points, select the Spline command from the Master Menu, or type a '9' on the keyboard.

Tap the points of the curve using the yellow or white buttons. Each time you tap, you will see a small black square appear on the screen, to mark the point you have selected. When you have tapped all of the desired points, press the green button on the puck. A curve will be smoothed between the points you indicated. Note that the curve is a smoothed one, and may not actually touch any of the points you tapped except for the first and last!

Splines can be any linewidth but only solid splines.

CAUTION: Not all plotters are capable of plotting smoothed curves. Make sure that you can output this graphic before using it.

a TEXT

To add text to a drawing, select the Text command from the Master Menu, or type 'a' on the keyboard. Then move the pointer to the position where you would like the text to begin, and press the button. If you press the yellow or white buttons, the text string will end when you hit the Return key. If you press the green button, you can type several lines of text. In this case, when you hit two Returns in a row, the text string will end. After you tap the appropriate button, you will see a vertical line appear on the screen. This line indicates where the first letter that you type will appear, and the height of this line indicates the height of the font in which text will be displayed.

If you wish to add another string of text, move the pointer to the position where you would like the second string to begin, and then tap the appropriate button.

The text will be added in whichever is the current font. To set a different font, see the Font description below.

There are two different types of text: raster and vector. Raster text has several flaws: it does not change size when you change the scale of the drawing, and it cannot be rotated easily. Also, raster fonts can only be paired in an approximate way with the fonts available on any given plotter. To position raster text properly when you are not working at a scale of 1, you should "select" the text, which will cause a black rectangle to be displayed on the screen. The size of the black rectangle is the size that the text will be at the scale at which you are currently working. Ignore the text itself, and position the black rectangle properly.

Vector fonts resolve many of these problems. Vector text changes scale as the drawing is re-scaled, and can be rotated, mirrored and transformed at will. As soon as the plotter interfaces are written to implement vector text, it will also allow an exact match between the font on the screen and on the plotted output.

b BUNDLE

Every item drawn on the screen, line, circle, arc, spline or text string, has its own 'origin', and moves independently of all other items. The 'origin' is a small black square, which the program positions at the centroid of the item. You can see this origin point by "selecting" an item. (See the detailed description of the Select command below.)

It is much more useful to combine items together into symbols, and move the symbols around on the screen as a single item. For example, if you drew a rectangle to represent a desk, each of the four lines comprising that desk would have its own origin. When you tried to move the desk, each line would move separately. To combine items into symbols, you use the Bundle command. Also, symbols can also be combined into higher level symbols. For instance, it may be very useful to move a dining table and six chairs about on the drawing as a single symbol.

To combine items into symbols, select the Bundle command from the screen Master Menu, or type 'b' on the keyboard. There are three basic ways to indicate which items you wish to bundle together.

If you wish to bundle a single item into a symbol, you can move the puck until the cursor is directly on that item, and tap the yellow button.

If you wish to combine several items into a symbol, you can use the white button to enclose them in a rectangle. Move the puck until the cursor is below and to the left of all of the items that you wish to combine. Press down the white button, hold it down, and slide the puck until the cursor is above and to the right of the items. Then release the button. All of the items COMPLETELY enclosed in the rectangle will be bundled together. Any item of which any portion is outside the rectangle will NOT be included.

Finally, if you have previously placed the items that you wish to combine together in the "selected" state, you can use the green button to bundle them. In this case, it does not matter where the pointer is on the screen, since all items in the selected state will be bundled together. CAUTION: tapping the green button will cause ALL items that are in the selected state to be bundled together, whether they are visible on the screen or not. It is strongly recommended that you de-select all before selecting the items that you wish to combine.

b BUNDLE, Cont.

After you have indicated which items you wish to bundle together, you will be asked to assign a name to the symbol. Type in the name, and then hit the Return key. You may just hit the Return key, and the DRAFT program will assign an arbitrary name to the symbol. However, this is not recommended, since symbols that have arbitrary names cannot be tracked, counted and tied to their attributes. The only time that you should just hit the Return key instead of assigning a name to a bundle is when you have created the symbol for purely temporary purposes, and intend to UnBundle it as soon as it has been rotated, mirrored, repositioned, or whatever.

The DRAFT program allows you to bundle items and symbols into more and more complex symbols without limit. Also, symbols can be un-bundled at any time, and they come apart in the same sequence that they were bundled. For example, if you made a table symbol and a chair symbol, and then bundled up a single symbol of a table and six chairs, you could unbundle that symbol and get the table and six individual chair symbols, which could then be unbundled to the individual lines and arcs with which they were drawn.

B UN-BUNDLE

You may wish to take apart a previously bundled item, in order to rearrange its components symbols, to modify a symbol found to be inadequate or in error, or, in certain cases, prior to sending a drawing file to a plotter.

To un-bundle a symbol, select UnBundle from the screen Master Menu, or type a 'B' on the keyboard. There are three ways to indicate which symbol or symbols are to be un-bundled.

You can move the puck until the cursor is pointing at the item that you wish to un-bundle, and tap the yellow button.

You can enclose the items that you wish to un-bundle in a rectangle using the white button. Move the puck until the cursor is below and to the left of the items that you wish to un-bundle, hold the white button down, and slide the puck up and to the right until the items are COMPLETELY enclosed by the rectangle. Then release the button.

If you have previously "selected" the items that you wish to un-bundle, you can simply tap the green button. This will cause ALL items in the selected state to be un-bundled, whether they are visible on the screen or not, so be very careful when you "select" the items.

After you tap the appropriate button on the puck, you will see the origins of the components of the symbol or symbols that you un-bundled appear on the screen. If you wish to continue to unbundle ALL these items further, just tap the green button again.

If you are un-bundling a lot of items, be patient after tapping the button. It may take a few seconds before the items on the screen in front of you start to be unbundled. DO NOT TAP THE BUTTON AGAIN AND AGAIN, ESPECIALLY IF YOU ARE USING THE GREEN BUTTON! These subsequent taps will be stored up by the DRAFT program, and executed after the current round of un-bundling is completed. This will result in items being un-bundled more than you intended or wished.

Note that when you un-bundle items, they un-bundle in exactly the same sequence in which they were bundled. If you have bundled a particular arrangement of bundled tables and chairs, then the first press of the green button will result in splitting that bundle into the individual tables and chairs. Additional presses of the button on the puck will result in further un-bundling.

## 8 AREA FILL

The Area Fill command is only partially implemented at this time. It allows you to fill an irregularly shaped area with a black tone. If you delineate an area on top of one that you have already turned black, it will turn white. Future releases of the DRAFT program will incorporate additional tones and patterns. Only a limited number of areas may be filled on a drawing at the present time.

To fill an area, select the AREA FILL command from the Master Menu, or type an '8' on the keyboard. Move the puck so that the cursor is pointing at each corner of the area to be filled, and tap the white or yellow button. You will see a small black square appear at each point that you tap. When you have finished indicating the corner points, tap the green button. The area you have indicated will be filled with a black tone.

\*\*\* MODIFY \*\*\*

m MOVE

To move a symbol on the screen, select MOVE from the screen Master Menu, or type the 'm' key on the keyboard. Then you must use one of the buttons on the puck to determine exactly which symbols or items will be moved.

To move a single item, point at it with the pointer, press down the yellow button, and hold it down while moving the item to its desired position.

To move an item that has been previously selected using the "s" select option, hold down the green button. Any item or group of items that has been selected will then move. If three items have been selected, they will all move, and they will retain the same arrangement relative to each other as they had on the screen prior to being moved.

A third way to move items on the screen is to use the white button on the puck to draw a rectangle around the desired items. This is useful for items that are all in the same general area. Press down the white button at a spot below and to the left of the items you wish to move, and then slide the puck up and to the right. You will see a rectangle being drawn around the items on the screen. When you release the white button, the rectangle will stay on the screen. Move the pointer to the center of the rectangle, press the yellow button, and move the items to the desired point. At that point, the rectangle will disappear. Note that only items entirely enclosed in the rectangle will be moved using this process. If any part of an item is outside the rectangle, that item will not move.

Notice that as you move an item, the distance and angle that you have moved it appear in the mileage meter pocket of the grey window border. This allows you to move an item an exact distance in an exact direction without relying on one of the grids.

m MOVE, Cont.

If you cannot seem to select the item that you wish to move, check to see if you have set a Snap Grid. If you are currently working at one Grid and the origin of the item you are trying to move was set at another Grid which happens to be incompatible with the current one, you will be unable to access that item's origin. Change the Snap Grid using the "g" key, and then move the item. If you continue to have trouble, drop the Snap Grid to 1, and then try to move it. If you still have trouble, see if the item has been bundled into another group, whose origin is in quite a different area.

It is possible to move items from one window to another. Simply hold the button down firmly as you slide the item from one window to the other. The item may disappear temporarily from view as it passes over the window boundaries, but do not release the button. The item will catch up with the pointer very quickly, and then may be positioned in the new window. If the two windows are set at different scales, the item will automatically be re-scaled as it passes across the window boundaries.

c COPY

To duplicate an item currently displayed on the screen, you use the copy function. Select COPY from the screen Master Menu, or type the 'c' key on the keyboard. There are three different ways to indicate which items you wish to copy.

You can point at the single item that you wish to duplicate, and hold down the yellow button. Then, move the puck and a duplicate of the item will move with it. Slide the copy off to the desired position, and release the button.

You can enclose the items to be duplicated in a rectangle. Move the puck so that the cursor is below and to the left of the items to be copied, press down the white button, and move the puck and up to the right until the items are completely enclosed by the rectangle. Then release the button. The rectangle will remain visible on the screen. Press down any of the buttons, and the items in the rectangle will be copied. Slide the copy off to the desired position, and release the button. Only items COMPLETELY enclosed by the rectangle will be copied.

You can also copy items that have previously been "selected". Press down the green button on the puck and all items previously selected will be replicated. Hold the button down while you slide the copy off to the desired position, and then release the button.

Note that if you copy an item, and leave the copy on top of the original, they will both disappear from view. This is because the DRAFT program uses a "reverse video" technique to alert you to such overlaps. If you accidentally release the button before moving the copy to a new position, go into the move function, and press down the yellow button in the area where the item disappeared. As soon as you move the copy off of the original, (use "m" to do this) both will again be visible.

As you move the copy about on the screen, the distance that you are moving it and the angle at which it is being moved are displayed in the mileage meter pocket of the grey window border. This allows you to replicate an item at a specific interval without relying on one of the grids.

c Copy

If you cannot seem to select the item that you wish to copy, check to see if you have set a Snap Grid. If you are currently working at one Grid, and the origin of the item you are trying to copy was set at another Grid which happens to be incompatible with the current one, you will be unable to access that item's origin. Change the Snap Grid using the "g" key, and then copy the item. If you continue to have trouble, drop the Snap Grid to 1, and then try to copy it. If you still have trouble, see if the item has been bundled into another group, whose origin is in quite a different area.

It is possible to copy items from one window to another. Simply hold the button down firmly while sliding the item from one window to the other. The item may disappear temporarily from view as it passes over the window boundaries, but do not release the button. The item will catch up with the pointer very quickly, and then may be positioned in the new window. If the two windows are set at different scales, the item will automatically be re-scaled as it passes across the window boundaries.

## C MULTIPLE COPY

The Multiple Copy option allows you to specify a number of copies that you wish to make of a certain item or items, and then position them at even increments.

To use this function, select MULTIPLE COPY from the screen Master Menu, or type 'C' on the keyboard. You will then be asked to type in the number of copies that you wish to make. Type the number, and then hit the Return key on the keyboard. You must then indicate the items that you wish to copy, which you can do in one of three ways.

You can point at the single item that you wish duplicate, and hold down the yellow button. Then, move the puck and a duplicate of the item will move with it. Slide the copies off to the desired position, and release the button. The mileage meter pocket in the grey border window shows the distance between the original and the furthest copy, so that you can space them accurately.

You can enclose the items to be duplicated in a rectangle. Move the puck so that the cursor is below and to the left of the items to be copied, press down the white button, and move the puck up and to the right until the items are completely enclosed by the rectangle. Then release the button. The rectangle will remain visible on the screen. Press down any of the buttons, and the items in the rectangle will be copied. Slide the copies off to the desired position, and release the button. Only items COMPLETELY enclosed by the rectangle will be copied. The mileage meter pocket in the grey border window shows the distance between the original and furthest copy, so that you can space them accurately.

You can also copy items that have previously been "selected". Press down the green button on the puck and all items previously selected will be replicated. Hold the button down while you slide the copies off to the desired position, then release the button. The mileage meter pocket in the grey border window shows the distance between the original and the furthest copy, so that you can space them accurately.

Depending on the number of copies that you requested and the complexity of the items that you are copying, you will either

C MULTIPLE COPY, Cont.

see all of the copies moving about on the screen, or only the copy that will be furthest from the original. In the latter case, once you release the button, all of the other copies will appear on the screen.

Once you have released the button, the copies are no longer linked in any way. If they are not correctly positioned, you will have to move each one individually, or delete them, and make another Multiple Copy.

e EDIT

Any line, circle, arc, spline or text string that you have drawn on the screen can be edited, to make it shorter or longer, change the diameter or degrees, or correct typing mistakes. Symbols, however, cannot be edited. If you wish to modify something in a symbol, you must first un-bundle that symbol to the level of lines and circles.

To edit any item, first select EDIT from the screen Master Menu, or type 'e' on the keyboard.

To edit lines: There are two ways to edit lines, depending on whether the lines are to be constrained to be horizontal and vertical, or not.

To edit a line that is or should be horizontal/vertical, move the puck until the pointer is positioned over the line, and then press down the yellow button. Whichever side of the line is closest to the cursor will become elastic, and move with the cursor. The length and angle of the line will again appear in the mileage meter pocket of the window border. Make the line the correct length, and then release the button.

To edit a line that is or should be unconstrained, move the puck until the pointer is positioned over the line, and press down the green or white button. Whichever side of the line is closest to the cursor will become elastic, and move with the cursor. The length and angle of the line will again appear in the mileage meter pocket of the window border. Make the line the correct length, and then release the button.

To edit circle or arcs: You can modify either the diameter of the circle/arc, or the number of degrees swept out.

To modify the diameter of the circle/arc, move the puck until the pointer is positioned over one end of an arc, or at the rightmost point of a circle. Press down the yellow button. The circle/arc will then move with the cursor, getting a larger or smaller diameter. The new diameter will be displayed in the mileage meter pocket of the grey window border. When the circle or arc is the correct size, release the button.

e EDIT, Cont.

To modify the number of degrees swept out by a circle or arc, move the puck until the pointer is positioned over one end of an arc, or at the rightmost point of a circle. Press down the green button. The circle/arc will then become elastic, and, as you move the puck, will sweep out more or fewer degrees. The new angle of the arc will be displayed in the mileage meter pocket of the grey window border.

To edit splines: You can drag any of the points of a spline, thus modifying the curve. To do this, you must first cause the points of the spline to be displayed on the screen. Move the puck so that the cursor is positioned at one end of the spline. Tap the yellow button. You will then see the small black squares that define the spline appear on the screen. To modify the spline, move the puck until the cursor is positioned over one of the black squares, hold down the yellow button, and drag the point to the desired position. You will see the spline follow the point, even though it does not touch it. You can then drag another point to a new position. When you have finished editing the spline, tap the green button to close it again, and to remove the black squares from the screen.

To edit text strings: You can delete and add characters to any text, string, either vector or raster.

To delete a character, position the cursor so that it is to the right of the character that you wish to delete, and tap the yellow button. The character will be deleted, and a vertical line will appear in the middle of the text string at the position where the character was deleted. Any text that you type now will be added at that point.

To add text without deleting characters, move the cursor to the point where you wish to add the letters, and press the white button. A vertical line will appear in the existing text string, to indicate the point at which characters will be added. Now type in the desired characters.

x STICKY EDIT

This powerful function moves the walls of a room in such a fashion that they stay 'stuck', or connected, to the other walls of the room, allowing you to change the dimensions of a room without actually redrawing any lines. It also allows you to move a door or window within a wall, without redrawing anything.

To make an edit of this type, select STICKY EDIT from the screen Master Menu, or type an 'x' on the keyboard. Move the puck until the cursor is pointing at the wall or door that you wish to move, hold down the yellow button, and slide the wall or door to the desired position. Then release the button.

For the Sticky Edit command to function properly, there are some important points to keep in mind:

First, the walls of the room must NOT be bundled together. If you are trying to move a wall and it is not responding, look down at the lower left corner of the window border, and see if a bundle name is being displayed there. If it is, then either the walls have been bundled, or there is another symbol in the area where you are positioning the cursor which is confusing the program. Either unbundle the walls, or remove the other symbol temporarily. If the symbol is on another layer, this can be accomplished by turning the 'Alter' capability off for the layer in which the symbol is located.

Second, in order to 'stick' to each other, walls must meet exactly. If one wall is too short or too long by even a tiny amount, they will not stick. Therefore, it is a good idea to use the Magnify function to verify that you have a good connection before trying to move the walls.

Third, you should note that the Move Sticky function assumes that each wall is comprised of a single line segment. If you have a wall that is made up of two or three small line segments, only the one that is actually attached to the wall that you are moving will stick to it, resulting in diagonal walls and other problems. Therefore, if you draw a line fractionally too small, do not add a short line segment to it to make it the correct length. Instead, use the Edit option described above to make it the correct length.

x STICKY EDIT, Cont.

Finally, you can also move the position of doors or other bundled items in walls using the Sticky Edit function. To do this, however, 'pins' must have been placed at the edges of the doors where the walls will touch them. This allows the DRAFT program to realize that the door and the walls are intended to 'stick'. Make sure that the walls are just touching the pins in the door. When you press down the yellow button over the door, the origin point of the door will be displayed on the screen, and as you move the door, all of the attached walls will move with it.

t CHANGE SYMBOL

This command allows you to rotate, mirror, and re-scale symbols. To utilize this option, select CHANGE SYMBOL from the screen Master Menu, or type a 't' on the keyboard. A pop-up CHANGE SYMBOL Menu will appear on the screen, listing the options available to you.

Rotate 90  
Rotate CCW  
Rotate CW  
Mirror Top/Bottom  
Mirror Left/Right  
Zoom  
Zoom X  
Remove Changes  
Display Changes

If you wish to rotate a symbol 90 degrees, place the pointer over the top item in the menu, and press the yellow button.

If you wish to type in a specific number of degrees that a symbol is to be rotated, select either Counter-Clockwise (CCW) or Clockwise (CW) rotation. You will then be asked to type in the number of degrees. Enter the number, which may include fractions, and then hit the Return key.

If you wish to mirror an item from top to bottom, select the Mirror Top/Bottom option.

If you wish to mirror a symbol from left to right, select the Mirror Left/Right option.

If you wish to rescale a symbol along both the x and y axes, then select the Zoom option. You will be asked to enter the scaling factor. If you wish to make the symbol twice as big as it is currently, enter a value of '2'. If you wish to make the symbol half as big as it currently is, enter a value of '.5'. Note that the scaling factor always applies to the current state of a symbol, so that if you have previously made a symbol twice as big and wish to restore it to its original size, you must enter a '.5'.

If you wish to rescale an item along the x axis only, select the Zoom X option. You will be asked to enter the scaling factor, as described above.

t CHANGE SYMBOL, Cont.

If you wish to restore an item to its original condition, select the Remove Changes option.

If you wish to find out what has been done to a symbol, select the Display Changes option.

Once you have selected the type of transformation you want, the pop-up menu will disappear. You must then indicate which symbol or symbols are to be transformed.

To transform a single item, move the puck until the cursor is positioned directly over the item. Then press the yellow button. The item will be transformed. Subsequent taps of the yellow button while the cursor is over the same item will result in further transformations. For example, if you have selected CCW rotation of 15 degrees, the first tap would rotate the item 15 degrees. A second tap would rotate it a further 15 degrees, for a total of 30 degrees, and so forth.

You may also indicate which items you wish to transform by enclosing them in a rectangle. Move the puck until the cursor is below and to the left of the symbols to be transformed. Press down the white button, and slide the cursor up and to the right, until the symbols are completely enclosed in the rectangle. Then release the button.

Or, if you have previously placed the items to be transformed in the "selected" state, you can simply tap the green button. You must be careful when you use this option, since this will cause transformation of items which are in the "selected" state but are not visible on the screen at the present time. Therefore, when selecting items, it is a good idea to de-select the entire drawing, and then select just those items you wish to transform.

Note that using either the white or green buttons to transform several symbols at once simply means that all of those symbols will be modified, it does NOT mean that they will be modified as if they were a single symbol. Therefore, if you have a room full of furniture, for example, that you wish to mirror from left to right, bundle it into a single symbol first. Otherwise, each individual item will be mirrored, but it will remain in its current position.

t CHANGE SYMBOL, Cont.

If you select the Display Changes option from the Change Symbol Menu, the transformations that have been done to the symbol you indicate will be displayed in the lower left corner of the screen.

It is important to realize that you can ONLY transform SYMBOLS. Lines, arcs and other basic elements cannot be transformed unless they are first bundled into a symbol.

n NEW PARAMETERS

The New Parameters option allows you to modify item previously drawn without redrawing them. You can change the thickness or style of lines, circle and arcs, you can change the font in which text is entered, and you can move items from one layer to another. In systems with color monitors, you can also change the color in which the items are displayed.

To use this option, select NEW PARAMETERS from the screen Master Menu, or hit the 'n' key on the keyboard. You will see a popup New Parameters Menu appear on the screen, similar to the following:

```
New Line Type: 1 Solid
New Line Type:
New Font: gacha 7 r 0 gacha7
New Font:
New Layer: STANDARD
New Layer:
New Color: 1
New Color:
```

**New Line Type:** If you wish to modify the thickness or style of a line you have already drawn, you should select one of the New Line Type options. The topmost one displays the previous default thickness and type. If that is what you want, select the top option. The second New Line Type option will cause the Line Parameter pop-up menu to appear on the screen, and you can select a different line thickness or line style.

**New Font:** If you wish to change the size or style of lettering already on the drawing, you should select one of the New Font options. The upper of the two displays the default option. If that is the size and style that you wish, select that item. If it is not, select the lower of the two, and you will see the pop-up Font menu appear on the screen, allowing you to select a new font.

**New Layer:** If you wish to change the layer on which items are located, you should select the New Layer option. Note that in order to switch a bundled symbol and its component parts from one layer to another, you must un-bundle it! The top option displays the current default layer. If that is the layer that you wish to switch things into, select that one. If it is not, select the lower New Layer option, and a pop-up Layer menu will appear on the screen.

n NEW PARAMETERS, Cont.

New Color: If you wish to change the color of an item, select the New Color option. If you want the default color value, select the top New Color option. If not, select the lower one, and you will be asked to enter the New Color value. At the present time, the only items affected by the New Color command are Area Fills, which will go from black to pale grey as you increase the color from 1 to 15.

Once you have selected the type of modification to be made to the items on your drawing, you must then indicate which items are to be modified. There are three ways in which you can do this.

You can indicate individual items to be modified by moving the puck until the cursor is pointing at them, and then pressing the yellow button. Each item will switch to the new thickness, style, font, layer or color.

Or, you can enclose the items to be modified in a rectangle. Move the cursor until the pointer is below and to the left of the items to be changed, hold down the white button, and slide the cursor up and to the right, until all of the desired items are completely enclosed in the rectangle. Then release the button.

Finally, if you have previously "selected" certain items on the drawing, you can modify these by just pressing the green button. Note that all items in the selected state will be changed, even if they are not visible on the screen at the present time, so you should be careful to ensure that the only items currently selected are those you wish to modify.

ONLY, LINES, CIRCLES, ARCS, SPLINES, AND TEXT STRINGS CAN BE CHANGED USING THE NEW PARAMETERS OPTION! Symbols cannot be modified, except to move the symbol name from layer to layer.

| CUT

During the course of a project, it is not unusual to wish to place a door, window, or other symbol in a wall which previously had no opening. To do this, you must cut an opening into the wall, splitting it into two sections. This is done using the CUT command.

To do this, select the CUT option from the screen Master Menu, or type a '|' on the keyboard. There are two ways to cut items.

You can cut lines, circles, arcs and text along a line that you draw using the yellow button. Move the cursor to the point where you wish the cut line to start, hold the button down, and slide the cursor to the point where the cut line should end. Notice that the cut line does not have to be horizontal or vertical, but will swing freely in any direction. When you release the button, all lines, circles, arcs or text strings will be cut into two pieces at the point where the cut line crosses the item. The items that are cut will be placed in the "selected" state.

Alternatively, you may wish to cut a piece out of an item, rather than cutting the item into two pieces. To do this, use the white button on the puck. Move the pointer to the position where you wish to start cutting a section out, hold down the white button, and slide the cursor up and over until the rectangle encloses the section that you want cut out. When you release the button, the enclosed section will be cut out, and placed in the "selected" state. You may then delete it or move it to one side, leaving the resulting opening for a door, window or other item.

There are a few restrictions on the operations of the CUT function.

Symbols and splines cannot be cut. Should a cut line pass through them, they will be left untouched.

Text is cut between letters, regardless of the angle at which the cut line passed through the text string.

d DELETE

You may delete an item from the drawing on which you are working by selecting the DELETE option from the screen Master Menu, or by hitting the 'd' key on the keyboard. Then there are several options as to the way in which you delete items.

You may point the pointer at a single item you wish to delete, and press the yellow button. In order to delete an item in this fashion, the pointer must pass over a portion of the item, at which time that item will disappear from the screen. If you accidentally pass the pointer over the origin of another item while holding down the yellow button, that item will also be deleted.

You can also delete the items occurring in a rectangle, using the white button on the puck. Move the pointer to a position below and to the left of the desired items. Press down the white button, and then slide the puck up and to the right, until the rectangle that appears on the screen encloses all the items you wish to delete, and only the items you wish to delete. Then release the button, and the enclosed items will disappear.

A third way to delete items is to have previously "selected" them. Then press the green button. All of the items that were in the "selected" state will be deleted. Note that if you have previously selected items that have not since been de-selected, they too will be deleted, even if they are not currently displayed on the screen. Therefore, you should de-select the entire drawing prior to selecting the items you wish to delete.

After you delete an item, it is held in a temporary memory for several moves. This is done to allow you to restore the item to the drawing in case you deleted it by mistake. The following section, Un-Delete, describes this in greater detail.

u UN-DELETE

Occasionally you may delete something that you immediately realize you really did not want to delete. In this instance, you may retrieve that item by using the Un-Delete function. You will also restore all other items that you may have previously deleted at the same time as the desired item, and these will have to be deleted again after the desired item is retrieved.

To restore items deleted in error, select the UN-DELETE option from the screen Master Menu, or hit the 'u' key on the keyboard. All of the items deleted in the last pass will be displayed again on the screen in their previous positions. Then you may keep or re-delete them as you wish.

This function only restores items deleted recently. Items deleted in previous work on the drawing must be re-introduced to your drawing in another way, either by being redrawn, or by being called up from another drawing. Once a drawing is stored, it loses the ability to un-delete the items previously deleted.

DRAFT/NET 2-D Drafting Program

\*\*\* SET \*\*\*

= Scale

In the DRAFT/NET program, the scale is set using the SCALE option in the screen Master Menu, or by typing an '=' on the keyboard. When you start up the program, the scale is automatically set at 1/4" = 1' scale. If you are in 'plan' range, the default option, then those scales will appear in the pop-up menu. If you change the range, using the 'k' or MISC CMD option, then scales appropriate to the selected range will appear. User specified scales are also available by selecting the last option in the pop-up menu.

Range	Grid Unit	Scale Factor	Scale
PLAN	1/2"	.125	1/32" = 1'
		.25	1/16" = 1'
		.5	1/8" = 1'
		1	1/4" = 1'
		2	1/2" = 1'
		4	1" = 1'
DETAIL	1/16"	.1875	3/8" = 1'
		.325	3/4" = 1'
		.75	1-1/2" = 1'
		1	2" = 1'
		1.5	3" = 1'
SITE	6"	.521	1/100" = 1'
		1.	1/48" = 1'
		1.042	1/50" = 1'
		2.084	1/25" = 1'
AREA	5'	.521	1/1000" = 1'
		1.	1/480" = 1'
		1.042	1/500" = 1'
		2.084	1/250" = 1'

Any scale can be chosen, whether architectural or not, metric or not. They are all entered as a multiple or a fraction of 1.

You may change scale at any time while using the DRAFT program. The information being displayed in different windows on the screen at the same time may be displayed at different scales. The DRAFT/NET program knows which scale is being used in each window, and will automatically re-scale any items that you move from window to window.

- LINE PARAMETERS

Lines, circles, arcs and splines can be drawn in several line thicknesses, and lines, circles and arcs may be drawn in four different line styles.

The default line thickness is 1, the finest line; the default line style is solid. To modify either of these, select the LINE PARAMETERS option from the screen Master Menu, or hit the '-' key on the keyboard. You will then see a pop-up Line Parameters Menu appear on the screen.

Thickness:	1	
	2	
	3	
	4	This menu is now iconic,
	5	not numeric.
	6	
	7	

Solid	
Dotted	This menu is now iconic,
Dashed	not numeric.
DotDash	

To select a different thickness or style, slide the black bar over the desired option and press down the yellow button. All lines drawn from that time until you select another value will be drawn in the new line thickness or style. To exit this menu, tap outside the menu with any button.

Note that splines can only be drawn in solid lines.

## f Font Selection

When the DRAFT/NET program is called up, it automatically gives you a choice of four fonts, a small horizontal font, a small vertical font, a larger horizontal font (all raster) and one Roman-Simplex vector font. Unless you choose one of the other three, or enter a new font, you will be using the small horizontal font.

To choose one of the other three fonts, or to enter a new font, select FONT from the screen Master Menu, or type the 'f' key on the keyboard. Then point the pointer at the black box next to one of the other three fonts, or next to the words New Font, and press the yellow button.

If you choose one of the other three fonts displayed there, any further work in text will automatically be in that font, until you change it again.

If you choose the New Font option, the computer waits for you to specify the new font. In the prompt area of the screen, it displays the format in which it must receive the font description.

Face Size Family Rotation FontName

Enter the information, followed by a CR. If you have entered a valid font, there will be a short pause while that font is loaded into the program memory. Any text that you then add to the drawing will automatically be in the new font. If you have not entered a valid font, you will hear a beep, and the program will again prompt you to enter the information it needs. Note that two vector fonts CANNOT have the same face and size! You must give each vector font a unique size, or a unique face, or you will not be allowed to enter the second one.

You can find out what fonts are available by getting a directory listing of files in the DRAFTNET area with extension code .KST for raster fonts, or .VFT for vector fonts.

If the drawing on which you are working has a font differing from the four standard fonts, then that font's name will also appear as a choice when you select the FONT option. Placing the cursor over that name and pressing the yellow button will mean that all text typed onto the drawing will be in that font.

g SNAP GRID

The Snap Grid controls the movement of the cursor on the screen. You can opt to have the cursor move freely, or to have it jump in increments that assist you in your work, such as 1' or 6". You may set a Snap Grid on any drawing at any time. The Snap Grid causes the symbols and lines on the drawing to move in the increments of the grid.

A series of snap grids can be entered for any drawing. Selecting the SNAP GRID option from the screen Master Menu, or tapping the 'g' key on the keyboard causes the DRAFT program to move to the next snap grid in the series. The Snap Grids are actually entered into the series using the MISC CMD MENU Mouse Grids command.

The default snap grids values are 1 and 3. In PLAN range, this equals 1/2" and 1-1/2", since the grid unit is 1/2". Each time you tap the 'g' key, the DRAFT program will switch from 3 to 1 or 1 to 3. The current grid is shown in the lower right-hand black border area.

~ DRAWING MARKS

When working on a large file, it may not be convenient to have to change the scale, locate a new area to work on, and then zoom in again on that area. The MARK options allow you to avoid this process by placing marks at key areas on the drawing, and then panning from one mark to the next at any point.

To insert a mark in a drawing, first call the drawing up on the screen, and center the area where you want the mark to go. Then select the MARK CENTER option from the screen pop-up menu. A mark will automatically be placed at that portion of the drawing currently in the center of the window, and a message will appear in the lower left corner of the screen telling you "This drawing mark has been assigned the number XX".

To insert another mark, use the window command to place another part of the drawing in the center of the window, and again select MARK CENTER from the screen menu.

If you have previously placed a mark on a drawing, and you no longer wish to use that mark, you can remove it from the drawing very easily. Simply select the DELETE MARK command from the pop-up menu. You will then see a pop-up menu of the valid drawing marks for this drawing. Tap the numbers you wish to delete, and they will then be displayed in reverse video. When you have indicated all the marks you wish to delete, position the cursor over the small X in the lower right corner of the menu, and press the yellow button. Marks you have not deleted will retain their original numbers.

After inserting marks on a drawing, you can pan from one to the next by simply selecting the GO TO MARK command from the screen pop-up menu. Each time that you use the GO TO MARK command, a pop-up menu of available mark numbers will appear on the screen. Indicate which mark you wish to go to, and the program will automatically window the drawing to position that mark at the center of the screen.

v LAYERS

The DRAFT program is a layered drafting program, which means that you can structure the information contained in a single drawing file into several layers, and combine those layers in various ways. This allows you to show certain information on drawings going to certain people, while suppressing it on others. For instance, while the owner of a building might wish to see both the furniture and the plumbing fixtures at the same time, the plumbing contractor might not wish to have his drawings cluttered up with furniture. The furniture could be suppressed in the second case, with no extra effort on the part of the architect, and a significant reduction in the problems of coordination and updating of various drawings.

To see a chart of the current layers of a drawing, select the LAYERS option from the screen Master Menu, or type a 'v' on the keyboard. A pop-up menu will appear, showing you all of the layers in use, with four categories of information about each layer.

Display	Alter	Output	Current
---------	-------	--------	---------

Those layers with a black rectangle under the 'Display' column are currently being displayed on the screen, while those with a white box are temporarily invisible.

Those layers with a black rectangle under the 'Alter' column are currently modifiable, while those with a white rectangle are temporarily frozen. A layer might be made unalterable in order to prevent accidental changes while working on another layer.

Those layers with a black rectangle under the 'Output' column will be stored on the hard disk the next time that you select the STORE DP FILE option from the Master Menu. A layer might not be selected for output to the hard disk if, for instance, you were using it as a sketch or guideline layer.

The one layer with a black rectangle under the 'Current' column is the layer into which the program will place all of the NEW items added to the drawing. This means that you can move something located on another layer, and it will remain on that layer, but if you draw something, or bundle something, that new information will be placed in the 'Current' layer. The 'Current' layer is displayed on the screen in the lower right corner of the black window border.

v LAYERS, Cont.

The default layer is STANDARD. You have three options as far as creating layers is concerned. These are shown on the screen in the pop-up menu just below the layer chart.

NEW LAYER  
RENAME  
DELETE

To add a New Layer, simply select the NEW LAYER option. You will be asked to enter the name that you wish the new layer to have, and, once you have hit the Return key, you will see the new layer displayed in the Layer chart above. You cannot add a layer with the same name as an existing layer.

To rename a Layer, simply select the RENAME option. A pop-up menu of all the current layer names will appear on the screen. Select the layer that you wish to rename, move the cursor so that the black bar is over that layer, and press down on the yellow button on the puck. You will then be asked to type in the new name. Once you hit the Return key, the name will be changed in the layer chart. You cannot rename a layer into a name that is already in use by another layer.

To delete a Layer, simply select the DELETE option. A layer that has anything in it cannot be deleted, nor can the current layer. After you select the DELETE option, a pop-up menu of the various layer names will appear on the screen. Select the ones you wish to delete, by moving the cursor so that the black bar is over that layer, and press down on the yellow button. When you have indicated all the layers you wish to delete, position the pointer to that it is over the small X in the lower right corner of the pop-up menu, and press the yellow button. All of the layers shown in reverse video will be deleted from the layer menu.

When you have finished arranging the layers to your requirements, tap the yellow button on the cursor outside of the layer menu, and it will disappear. If you changed the 'Display' column at all, the drawing will be redrawn, reflecting those changes.

P PINS

The pins are used to allow symbols, such as walls and doors, to "stick" to walls, counters and so forth, when you are using the Sticky Edit function. Pins must be located at the points on the symbols where you want the lines to "stick".

To add pins to an item, select the PINS command from the screen Master Menu, or type 'P' on the keyboard. Then move the pointer to the position where you would like the first pin to be located, and tap the appropriate button.

If you tap the white or yellow buttons, the program will ask you to assign a pin number to the pin. The pin numbers are essentially irrelevant. Enter any whole number, and hit the return key. You will then see the pin symbol number appear on the screen.

If you tap the green button, the program will assign a pin number, starting with '0' for the first pin, '1' for the next, and so forth.

You can continue to add as many pins as you wish, before returning to the Master Menu to bundle them into the symbol. It is important that the pins be located accurately in the symbol. Zoom in using the Scale or Magnify commands to be sure. Once the pins are located on the screen, you can move them about just as you would any other item. The pins MUST be a part of the final symbol.

Once you have finished positioning the pins and have bundled the symbol, you can reset the screen so that the pins and pin numbers are no longer visible. You do this in the MISC CMD MENU, by tapping the two lines that say PINS YES, and PIN NUMBERS YES, at which point they will change to read PINS NO and PIN NUMBERS NO.

M MAGNIFY

There are several situations in which it is useful to examine a portion of the drawing currently on the screen without zooming in on it. To do this, use the MAGNIFY option from the screen Master Menu, or hit the 'M' key on the keyboard. A small round magnifying glass will appear on the screen, and will move with the movement of the puck.

You can change the degree of magnification within the magnifying glass by using either the white or green buttons on the puck.

Tapping the white button will increase the degree of magnification. At each tap, you will zoom in on the area under the glass by a factor of 2.

Tapping the green button will decrease the degree of magnification. At each tap, you will zoom out on the area under the glass by a factor of 2.

The default setting for the magnifying glass is zoomed in by a factor of 2.

When you have finished using the magnifying glass, hit any key on the keyboard, and it will disappear.

## A MEASUREMENTS

At times during the course of a project, you will want to be able to calculate the length of a line or the area of a room automatically and you may want to add those dimensions to the drawing itself.

To do this, select the MEASUREMENTS option from the screen Master Menu, or hit the 'A' key on the keyboard. You may then proceed to measure either a distance or an area.

To measure a distance, move the puck so that the cursor is positioned at one end point of the line, and tap the yellow button. You will see a small black square appear on the screen at that point. Then move the puck so that the cursor is positioned at the other end of the line, and tap the yellow button again. You will see another small black square appear on the screen at that point. The distance between those two squares is now displayed in the mileage meter window in the upper left corner of the grey window border.

To measure a perimeter, or a distance that is comprised of smaller segments, simply move the cursor from one end of each segment to the next, tap the yellow button, and move on. The cumulative distance is displayed in the mileage meter window.

To measure an area, move the puck so that the pointer is positioned at one corner point of the space to be measured, and tap the green button. You will see a small black square appear at that point. Then move the puck until the cursor is positioned at the next corner point, and tap the green button again. Continue in this fashion until you have tapped the button at each corner point of the space, however many of them there are. Then bring the pointer back to the first point, and tap the YELLOW button. This closes the area, and the square footage will then be displayed in the are window in the upper right corner of the grey window area.

After measuring a distance or an area, you may wish to clear the mileage meter before doing another measurement calculation. To do this, tap the white button on the puck.

A MEASUREMENTS, Cont.

After measuring a distance or area, you can bring the text string down into the drawing if you wish. To do this, move the puck so that the pointer is positioned directly over the text in the grey window border. Press down and hold down the yellow button, and slide the puck down so that the text string appears within the window. Move the text to the desired position, and release the button.

## ] DIMENSIONS

The Dimension command allows you to automatically add a string of dimensions to an existing drawing. Prior to selecting this command, you may choose to set a variety of parameters using the Auto Dimension Options command in the 'k' Miscellaneous Commands menu. This allows you to select the type of dimension indicator you wish, such as slashes or arrowheads, to pick the font and size the dimensions will appear in, and so forth.

To dimension the drawing, tap the yellow button at the point you would like the dimension string to start from. Tap it again at the next point in the string, and again at the next. Continue tapping the yellow button until you reach the last point you wish to dimension to. Small black squares will appear on the screen to indicate the points you have picked. If you make a mistake tapping the points, tap the white button to clear, and start over.

When you have finished indicating the points in the dimension string, move the pointer to the location where you would like the dimension line to be, and press the green button. Immediately after you tap the green button, the dimension string will be created, and will appear on the drawing.

' SCREEN GRID

It is possible to have a grid of dots displayed on the screen while you are working on the drawings. This grid, once the grid interval is set, may be turned on or off at any time.

In order to turn the grid on or off, select the SCREEN GRID option from the screen Master Menu, or hit the ''' key on the keyboard. If the screen grid is on, this will cause it to be turned off. If it is off, this will cause it to be turned on.

The interval of the Screen Grid is set in the MISC CMD MENU.

w WINDOW

Move Window

The drawings that you work on in the DRAFT/NET program may be of any size, including sizes substantially larger than the approximately 8-1/2" x 11" or 15" x 11" screen area. When you are working on a drawing that is larger than the display area of the screen, the screen functions as a window over the drawing. You look through the window at a portion of your drawing, and you may move the drawing behind the window in order to look at a different portion.

To move the window over a drawing, select the WINDOW command from the screen Master Menu, or type the 'w' key on the keyboard. Then press down the green button on the four-button puck, and, while holding it down, slide the drawing to the right, left, up or down. When you release the puck, the computer will recalculate the drawing to display that portion of it currently in the window. (The white, yellow and green buttons all act in essentially the same manner in this command, but the green has a faster response time, which is why we recommend it here.)

Change Window Arrangement

You can manipulate the window that initially appears on the screen when you start up the program in several ways. You can split the window into two windows, and then split each of those into two windows. You can delete a window. You can move the position of a window on the screen. And you can make a window change its shape. To manipulate the windows, first look at the border of the window itself. In the corners of the grey border, you should see small symbols. These are the keys to manipulating the windows.

Split Windows

To split the window into two even pieces, move the pointer into the lower left corner of the window, where you will see a small symbol of two rectangles, one on top of the other. With the pointer exactly on top of this symbol, press the yellow button. The window will be split in two. To split the lower of those windows, press the yellow button while the pointer is over the symbol again. To split the upper of those two windows, move the pointer to the same spot in the lower left corner of the upper window, where you will see the same symbol. Then press the yellow button, and that window will be split.

w WINDOW, Cont.

Delete Windows

To delete a window, first delete any drawings being displayed in that window. Then move the pointer to the upper left corner of the window where there is an X. With the pointer directly over the X, press the yellow button. The window will be deleted.

Expand/Contract Windows

To expand a window, move the pointer to the upper right corner of the window, where there is a small symbol of a rectangle within a rectangle. When the pointer is directly over that symbol, press down the yellow button and HOLD IT DOWN. Slide the pointer up or down, right or left, and you will see a black rectangle move with the pointer. This rectangle indicates the size the window will be. Move the pointer until the rectangle is the desired size, and then release the button. The window will be redrawn to that size.

You must be careful when trying to change the size of a window. If the pointer is not directly over the change symbol, and you press down and hold the yellow button, you will be moving the existing window around on the screen without actually changing its size. Watch the rectangle to be sure it is changing size, not just moving.

Move Windows

To just move a window without changing its shape or size, move the pointer so that it is in the grey area that marks the edges of the window, but NOT over one of the special window symbols in the corners. Press down the yellow button, and hold it down. As you then move the puck, a rectangle that is exactly the size of the window will move with it. Whenever you position this rectangle is where the window will be moved.

r REFRESH

Occasionally, and particularly when working with very large complex files, you will see "shadows" left on the screen when you modify an item. These can be removed from the screen by asking the DRAFT program to redraw the drawing.

To do this, select the REFRESH option from the screen Master Menu, or type the 'r' key on the keyboard. You will see the drawing regenerated, minus the "phantoms". When the drawing has been completely redrawn, you can continue with your work.

## I INPUT DP FILE

To call up a drawing that is stored on the hard disk, select the INPUT DP FILE command from the screen Master Menu, or hit an 'I' on the keyboard. After a short pause, a pop-up menu of the various Draft Program (DP) files stored in the DRAFTNET area of the disk, and of the names of the various sub-directories will appear on the screen.

If the file that you wish to recall is located in the DRAFTNET area, simply select it by moving the puck until the cursor is located over the desired file, and press down the yellow button. The cursor will be temporarily frozen on the screen, and a message that the file is being read in from the disk will appear in the lower left corner of the screen.

If the file that you wish to recall is located in a sub-directory, select the appropriate sub-directory name first, by sliding the cursor up and down until the black bar is positioned over that name, and tapping the yellow button on the puck. After a short pause, a pop-up menu listing the files located in that sub-directory will appear on the screen. Select the file that you wish to recall, move the cursor until the black bar is positioned over that name, and tap the yellow button. A message that the file is being read in will then appear in the lower left corner of the screen, and a progress indicator shaped like a hand will start to move down the right hand edge of the screen.

Looking at the pop-up filename menu, you may notice that files have extensions .DPA and .DPB. The .DPA files are files stored in an ascii format, that is, they are alphanumeric, user-readable files. The .DPB files are files stored in a binary format, which is unreadable except to the DRAFT program. The binary files are more compact, and therefore can be read in more quickly than the ascii files.

The drawing will appear on the screen shortly, at whatever scale you were working at before.

If there are more files in the directory than can appear on the screen at once, a partial list will be displayed, and a scroll symbol will appear at the bottom of the list. To scroll through the list of files, move the cursor until it is located directly over the scroll symbol. Hold down the yellow button on the puck, and you will see the list of files start to move. By moving the cursor to the right or left, you will scroll down or up through the file. The further to the right or left that you move the cursor, the faster the scroll will be.

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If you know the name of the file that you wish to recall, and you do not want to have to scroll through the entire list to find it, you can type it in. Simply start to type the name. You will hear a beep sound, the pop-up menu of file names will disappear, and a box will appear on the screen, with a message asking you to enter the filename. Type it in, and then hit the Return key. If the filename as you type it is not found on the disk, an error message will appear in the prompt area to tell you so. Retype the name properly, or use the pop-up menu. You must enter the complete file name, including the .DPA or .DPB extension. If you do not, a message will appear in the lower left corner of the screen reminding you that this is essential. Repeat the process, this time entering the entire name.

Note that the pop-up menu of file names is created at the time that you call up the DRAFT program, and is not updated until you exit from the program. Therefore files that you have just created will NOT APPEAR in the pop-up menu until the next time that you use the DRAFT program. This does not mean that they have not been stored.

To recall a recently stored file, select the INPUT DP FILE command from the Master Menu, and then type in the name you assigned to the drawing.

i INPUT SYMBOL

To call up a Graphic Unit, or symbol, stored in a drawing file on the hard disk, select the INPUT SYMBOL option from the screen Master Menu, or hit an 'i' on the keyboard. A pop-up menu will then appear on the screen, showing the names of all the files in the DRAFTNET area. Select the file in which the symbol you wish to recall is stored, by sliding the cursor up and down until it is over that filename, and then pressing the yellow button on the puck. After a short pause, a list of the various symbols contained in that file will appear on the screen. Select the symbol that you wish to recall, by sliding the cursor up and down until it is over the appropriate symbol name, and tapping the yellow button. After another short pause, that symbol will appear on the screen.

Note that symbols that have not been given names by the user cannot be recalled using this option. The only symbols whose names will appear in the pop-up menu are those which have been given identifiable names. This is yet another reason not to just hit the Return key after bundling a symbol.

j INPUT TEXT FILE

It is possible to display in the DRAFT/NET program an alphanumeric file that has not been stored in the DRAFT Program graphic format. To do so, select the INPUT TEXT FILE command from the screen Master Menu, or hit the 'j' key on the keyboard. Then type in the name of the file you wish to enter, including its extension code.

Note that the alphanumeric file must be in the DRAFTNET partition of the disk for the program to find it. If it is not, enter the partition name as part of the filename.

The alphanumeric file will be displayed on the screen in whatever font is currently in use. To enter the file in a particular font style, choose the font first, and then enter the text file. (See f Font Selection discussion.)

@ INPUT CMD FILE

If you have previously made a macro command using the TRANSCRIPT function, you can execute it using the INPUT CMD FILE option.

To do this, select the INPUT CMD FILE command from the screen Master Menu, or hit the '@' key on the keyboard. You will then be asked the name of the command file. The default name is DPScript, unless you have renamed the command file after creating it.

After you hit the Return key, the command file will be executed.

### 3 VIL File Handling

It is possible to create a 3-dimensional model from the 2D DRAFT file using the '3' command. The '3' command applies to all selected items, so before exercising it, you should de-select all items, and then select those items that will have the same base elevation and wall height, and that you wish to be in the same 3D component file. Then type the '3' command, or select VIL File Handling from the Master Menu. When you select this command, you will see the following menu appear on the screen.

```
Create 3D View File
Master 3D View File
Circle Segments: 8
Spline Segments: 8
```

To create a 3D component, select the Create 3D View File option. You will then be asked to give a name to the file. Type in the desired name, and hit the Return key. Next, you will be asked to specify the Base Elevation. Type the number, in feet and decimal fractions of feet, and hit the Return key. Next, you will be asked to specify the Wall Height of the selected items. Again, enter the height of the wall in feet, and decimal fractions of feet. Note that you are entering the actual height of the wall, not the top elevation. Then, you will either get a message that the file is being created, or you will be asked to specify a center point for the file. (You determine whether you wish to specify the center or to have the DRAFT program do it for you in the 'k' Miscellaneous Commands menu.) If you have opted to specify the center point yourself, move the pointer so that it is located over the desired point, and tap the yellow button. The VIL file will be stored in the VUNET area of the disk.

After you have created all of the various 3D component files, you must create a Master file to combine them all together. Select the Master 3D View File command from the pop-up menu. You will then see another pop-up menu containing all of the names of the VIL files you just created. Select the ones that should be combined together, by tapping the yellow button on them. When all the desired files are shown in reverse video, move the pointer so that it is over the small X in the lower right corner of the pop-up menu, and press the yellow button. You will then see a message in the lower left corner of the screen that the master file has been stored.

If you have circles or splines among the selected items you are making into a VIL file, you can control the number of segments that they are broken into. The default setting for both is 8. To increase this number, select the appropriate option, and type in the desired number of segments.

[ PICTURE FILING

If you have certain optional software modules on your GRAPH/NET System, you may want to call up files created there in the DRAFT program. This would include files created in the free-hand sketching module, and files created using the photo-digitizing scanner. You can also create Picture Files in the VU Program.

To input these files, select the PICTURE FILING command from the screen Master Menu, or hit the '[' key on the keyboard. You will see the following menu appear on the screen:

```
Read Picture
Save Picture
Show Sequence File
```

To input a PIC file that you have already created, select the Read Picture option. You will then be asked to type in the name of the picture file. Type the name, and hit the Return key. After a short pause, the PIC file will be displayed on the screen.

To save a portion of your drawing as a PIC file, select the Save Picture option. Then move the cursor to a spot below and to the left of the area you wish to save, press down the yellow button, and slide the cursor up and to the right. You will see a rectangle appear on the screen. When you release the yellow button, the area enclosed in the rectangle will be stored as a PIC file. You will be asked to enter a name for the PIC file. Type the desired name, and then hit the Return key.

If you have a series of PIC files that you wish to display one after the other, you can use the Show Sequence File option to display them. You will be asked to enter the name of the sequence file. Type the name, and hit the Return key. After a short pause, the first PIC file in the sequence will appear on the screen. The others will follow in the order in which they are called in the sequence file. The contents of the sequence file should look like this:

```
TIME msec1
FILE name1.pic
FILE name2.pic
PAUSE msec2
FILE name3.pic
```

The TIME command controls how long each file will be left on the screen before the next one is read in. It is entered in milliseconds, so 5 seconds is entered as 5000.

The FILE command gives the name of the pic file.

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The PAUSE command allows you to change the time that an individual file will be left on the screen before the next one is read in. Other files will use the value in the TIME command.

Note that the commands must be entered in capital letters.

Once you have read in a PIC file, if you again call up the Picture Filing menu you will see two new options:

Remove Picture  
Switch Picture OFF

If you wish to get rid of a picture file, select the Remove Picture option. The picture file will disappear from the screen. To see it again, you must read it in once more.

If you wish to remove the picture file from the screen temporarily, select Switch Picture OFF. The picture will disappear from the screen. When you want it back, return to the Picture Filing menu, and select this option again; this time it will read Switch Picture ON. The picture file will reappear on the screen.

Remember that these files are raster-based files. Once they have been called up onto the screen in the DRAFT program, they cannot be modified in any way.

o STORE DP FILE

After you have created a drawing in the DRAFT program, you should file it on the hard disk for future use. You must remember that the version of the drawing on which you have been working is only stored in temporary memory, until you specifically command the program to make a longer-term copy on the hard disk. If you do not do so, you may lose some of the work you have done. (You will probably not lose all of the work you have done, since there are some safeguards built into the DRAFT program to try to protect you against this eventuality. Please read the MISC CMD MENU Checkpoint section for further information.)

To store a drawing away on the hard disk for later reference, select the STORE DP FILE command from the screen Master Menu, or hit the 'o' key on the keyboard. Then type in the name that you wish to call the file. The program will automatically add the .DPB extension to the filename, so you do not have to type that in. The default name for the file is TEMP, and this will appear on the screen. This is the name that the file will be given if you simply hit the Return key without entering an alternate filename.

If you have been working on a file that was previously stored on the disk, then that name will be displayed on the screen instead of the default name. If you wish to store the drawing away under the same filename, then you can just hit the Return key. You should verify that the file will be stored under the correct name, by checking the name displayed in the prompt area of the screen PRIOR to hitting the Return key.

It will take a minute to store the file, during which time a small progress indicator shaped like a hand will move down the right hand edge of the screen. Then a message stating that the file has been written will be displayed in the lower left corner of the screen.

If you accidentally hit the Return key before entering your filename, the drawing will be stored under the default name 'TEMP'. You must repeat the storage process to enter the correct filename.

If you have accidentally overwritten a file you want to save under its old name, do not panic. Whatever you do, do not continue to work on the drawing you have just stored. A copy of the older version of the file is still on the hard disk, with a '\$' attached to its name. Therefore, you can rename this older version, and have both back. Make a note of the name and call the systems manager to help 'restore' the overwritten drawing.

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Please note that the default storage format for all DRAFT program files is binary, indicated by the .DPB extension. If you wish to store a file in ascii format so that you can read and edit it, you must give the full filename when you output the file, including the extension .DPA.

h HARD COPY

To obtain a hardcopy of the screen area of the drawing you are working on, select the HARD COPY command from the screen Master Menu, or hit the 'h' key on the keyboard. Then you will be asked to indicate the number of Screen Dumps that you wish to make. Enter the desired number, and then hit the Return key.

You will see a black bar begin to slide to the left. This indicates how much of the hard copy has been sent to the printer. You may stop the hard copy at anytime during the screen dump by typing the 'q' on the keyboard. A small box will appear asking for confirmation. Type 'y' and a carriage return if you want to quit the hard copy. Tap any button on the puck or type 'n' and a carriage return if you wish to continue.

The exact amount of time that a screen dump hard copy takes depends on the printer/plotter that you have on your GRAPH/NET System. The prism dot matrix printer/plotter is the slowest, and the Canon laser printer is the fastest.

When the hard copy has been entirely transferred into the printers buffers or when you have interrupted the hard copy, the cursor will once again move about the screen.

O PLOT FILE

To make a plot, select the PLOT FILE option from the Master Menu, or type the O key on the keyboard. You will be asked to confirm that you wish to make a plot, and to answer a series of questions that vary depending on the plotter you have connected to your system. After you have answered the last question, the file will be created. Then you can continue to work. Until that time, the cursor will be frozen.

For H-P users, the spacing of dot, dash and dot-dash lines has been changed to more closely conform to the screen image. To do this, control of the spacing was taken by DRAFT from the plotter, so there is a small increase in plot time. In addition, H-P users can now use the rotation button on their plotters to rotate the drawing 90 degrees.

For Versatec users, the ability to interface with the fileserver over the RS-232 line in addition to by floppy was added. This results in faster plot times, and less congestion on the GRAPH/NET units. After selecting the O Plot option, you will now see a pop-up menu with the choice of 'Output to Plotter' or 'Output to File'. Output to Plotter sends the file directly to the fileserver; whereas Output to File stores the file on disk for later transfer to a floppy.

s SELECT

It is often useful to pre-select certain items on the screen for whatever option you are going to perform next, to ensure that the desired items are acted upon. To select certain items, use the SELECT command from the screen Master Menu, or hit the 's' key on the keyboard. There are several ways in which you can indicate those items that you wish to have placed in the "selected" state.

To select a single item, move the pointer to that item, and press the yellow button. You should see the 'origin' of the item, a small black box, appear on the screen. If it did not, try again until it does, or use the option below.

To select certain items, you may use the white button to draw a rectangle around the desired items. Press the white button at a spot below and to the left of the desired items, then slide the puck up and to the right. You should see a rectangle appear on the screen. When you release the button, the origins of the items COMPLETELY enclosed in the rectangle will appear.

To select all the items on the entire drawing, whether currently displayed on the screen or not, press the green button. You should then see the origins of all the items light up, a multitude of black boxes.

If you cannot seem to select an item, check to see if you are working at an incompatible Snap Grid. If you are currently working at one Grid, and the origin of the item you are trying to select was set at another Grid which happens to be incompatible with the current one, you will be unable to access that item's origin. Change the Snap Grid and then select the item. If you continue to have trouble, drop the Snap Grid to 1, and then try to select it. If you still have trouble, see if the item has been bundled into another group, whose origin is in quite a different area.

**z DE-SELECT**

When you have selected certain items to be acted upon, and after you have produced the desired effect on those items, you should de-select them, so that they will not be accidentally operated upon in the future.

To de-select items, use the DE-SELECT command from the screen Master Menu, or hit the 'z' key on the keyboard. Then you have a choice.

To de-select all items previously selected, hit the green button. You should see all of the origins that had been displayed on the screen disappear.

To de-select a single item, point at it, and hit the yellow button on the puck. You should see its origin disappear.

To de-select several items, you may enclose them in a rectangle. Move the pointer to a spot below and to the left of the desired items, and press down the white button. Then slide the puck up and to the right, and a rectangle should appear on the screen enclosing certain items. When you release the button, the origins of those items entirely enclosed in the rectangle will disappear.

It is a very good idea to de-select ALL items on the drawing periodically, and certainly prior to manipulating selected items. Otherwise, you may find yourself with a real mess on your hands.

k MISC CMD MENU

The Miscellaneous Command Menu has been simplified greatly, and most of the commands in it have been converted to toggle switches, ie. either ON or OFF, or to value switches, ie. either 50 or 100. The exception to this is the Print in Black Mode Command.

Selection of the MISC CMD MENU option causes a pop-up menu that looks as follows to appear on the screen:

```
RANGE                :PLAN
UNITS                :in
CHECKPOINT           :100
DISPLAY GRID        :6
GRAVITY              :0
MEASURE ENABLED     :YES
CENTER FILES        :YES
TOGGLE CURSOR       :NO
DIM IN CURSOR       :NO
PIN NUMBERS         :NO
PINS                 :NO
DISPLAY IN BLACK MODE
AUTO DIMENSION OPTIONS
CENTER 3D YES/NO    :NO
```

All of the options are the same as in previous versions, except the last two options, which are new.

Selection of the Auto Dimension Options command allows you to select the desired options for the Dimension command discussed above. The following pop-up menu will appear:

```
Text Font
Indicator Type
Dimension Line Parameters
Witness Line Parameters
Indicator Line Parameters
```

Selection of any of these will result in a further pop-up menu of choices.

Selection of Text Font will produce a menu of available fonts, identical to the menu you would see if you selected the 'f' Font command. Simply tap the desired font, or enter a new one.

Selection of Indicator Type will produce the following pop-up menu:

```
None
Slash
Arrowhead
Circle
```

Tap the desired indicator type; the default is slash.

k MISCELLANEOUS COMMANDS, cont.

Selection of the final three options will produce the Line Type pop-up menu. Simply select the desired line thickness or style for either the dimension lines, witness lines, or indicator types.

Tapping the Center 3D Files option will toggle you between YES and NO. When Center 3D is set to YES, you will be asked to specify the center point. When Center 3D is set to NO, the DRAFT program will automatically specify the center point. The default is NO.

There have been a couple of other changes to items already in the Miscellaneous Command menu.

CKP\$ files are no longer created. The creation of the Checkpoint files is unchanged, but the older checkpoint file will simply be erased when the new one is created. This will cut down on disk utilization, especially by those of you working with very large file sizes. Also, CKP files are now binary.

Metric files now are measured in millimeters, instead of centimeters. The only two unit types currently available therefore are inches and millimeters.

### Parts List

The Parts List option allows you to display on the screen or write to a file the structure of all the symbols in the drawing, and the total number of each symbol.

To use this command, select PARTS LIST either from the screen master menu, or '?' on the keyboard. The pop-up menu will appear on the screen. Select the 'Show Symbol Structure' option. You will be asked to enter the name for the file to be written on the hard disk. This file will have extension code '.so'. Enter the name, and hit the Return key. If you do not want to store the file, just move the pointer outside the box, and tap the button. You will then see the diagram of the symbol organization appear on the screen, as follows:

Symbol Structure				
Name	Instances	Sub-name	Sub-instance	

Symbol Count

Under the Symbol Structure section, you will see each top-level symbol in the Name column, and the number of times it appears on the drawing in the Instance column. Sub-symbols which were used to make up the top-level symbol will appear in the Sub-name column. If those Sub-symbols were in turn comprised of other symbols, then the Sub-symbol in turn will appear in the Name column, but with a count of 0 instances, and it's Sub-symbols will appear in the Sub-name column.

Under the Symbol Count section, you will see the total number of instances of each symbol on the current drawing.

\$ TRANSCRIPT

It is possible to make a macro command of repeated functions in the DRAFT program. To do this, you must use the TRANSCRIPT function from the screen Master Menu, or hit the '\$' key on the keyboard.

After you select the TRANSCRIPT function, every command that you make will be recorded as part of the macro command, until you again select the TRANSCRIPT function. The second selection closes the transcript.

Transcript files are stored on the disk as DPScript. If you wish to create several of these, you will have to rename each of them after you create them; otherwise they will be overwritten by subsequent transcripts.

To use the Transcript, see the @ INPUT CMD FILE discussion above.

UPDATE NOTICE FOR VU VERSION K1a  
-----

Two changes have been made to this version of the VU/NET Program, and our discussed in detail below.

1. All .VIL files which have been read into the program from the hard disk will have a set of initial view points generated for it. The first viewpoint is no longer 0,0,0, which, in the past, caused an error message to appear. To avoid this, the points are automatically generated when the file is first read in. They can be altered in the usual manner, these points are not permanent. The program just creates its own starting point.

2. You are now able to save any of your perspectives as .pic files that can now be accessed by the DRAFT program. Any view can now be saved as a .pic file.

To save a portion of your drawing as a .pic file, select the Save/Retrieve option. Then move the cursor to a spot below and to the left of the area you wish to save, press down the yellow button, and slide the cursor up and to the right. You will see a rectangle appear on the screen. When you release the yellow button, the area enclosed in the rectangle will be stored as a .pic file. You will be asked to enter a name for the .pic file. Type the desired name, then hit the Return key. You are now able to exit the VU program and call this newly created .pic file up in the DRAFT program. One word of caution, the files will not yet be automatically stored in the draftnet partition. They will be stored in the vunet partition until you copy them into the partition you wish. Please see discussion of picture files in the DRAFT manual.



DRAFT/NET 2-D Drafting Program

H HELP

There is an on-line Help system built into the DRAFT program.

To display this function, simply select the HELP command from the screen Master Menu, or hit the 'h' key on the keyboard.

A list of the various categories of help will be displayed on the screen. Follow the commands in the help program to find out what you need to know.

q QUIT

When you have finished working the DRAFT program, and after you have stored all of your current work on the Hard Disk, you should use the QUIT option to exit the program.

Select the QUIT command from the screen Master Menu, or hit the 'q' key on the keyboard. You will then see one of two messages.

If you have not done anything since storing your work away, you will see a message asking if you are sure you want to exit from the program. The default answer in brackets will be Yes. Simply hit the Return key.

If you have done anything since then, you will see the message asking if you are sure you want to exit, but the default answer will be NO. If you have forgotten to store your work, just hit the Return key, return to the DRAFT program, and do so. If you want to exit anyway, type YES, and hit the Return key. You will then see a message telling you that changes have been made to your file, and asking you to confirm that you want to exit. Type YES again, and hit the Return key.

After a short pause, the DRAFT screen will disappear, and you will be back in the overall system Shell.

The DRAFT.Profile contains defaults which are put into effect each time you enter the DRAFT program. You may override the defaults after you are within DRAFT if you wish. Adapting a profile to the tasks you perform most often will greatly enhance you efficiency.

To make modifications to the DRAFT.PROFILE, do the following:

- 1) path into the boot partition of your disk
- 2) edit "draft.profile"

The following modifications may be made by individual users.

You may specify that more than one window be opened, by including begin-window and end-window statements. Between those statements, you may insert only certain commands that pertain to windows.

If errors are encountered in the profile, DRAFT will print a warning and ask for permission to continue.

New values override old ones. Therefore if you put a command into the profile more than once, the last value is retained until you change it within DRAFT.

The following sections give the keyword, description of the values, and an example for each command which may be placed in the profile. For your convenience, unless stated otherwise the example shows the default value that DRAFT will use if you do not put the command in your profile. Of course, if that is the option you want you do not need to put the statement in your profile. Although ON and OFF are capitalized in the following sections, you do not have to capitalize them in your profile.

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The following commands are recognized:

- pin-number            If ON, pin numbers are displayed.  
Default: pin-numbers OFF
- pin-positions        If ON, pin positions are displayed.  
Default: pin-positions OFF
- use-extensions        If ON, DRAFT will use the .DP extension when  
looking for input files and will append  
the .DP extension to output files. If OFF,  
DRAFT first tries the name without any  
extension, and it append no extension to  
output files.  
Default: use-extension ON
- center-files         If ON, a file which is read in will be  
centered in the current file. If OFF,  
items will appear in the same location  
as on the original drawing.  
Default: center-files ON
- rename-symbols        If ON, a symbol is renamed if a file  
containing a symbol with the same name  
is read in with the I command (a \$ is  
appended to the name of the symbol in  
the current file). If OFF, the symbol  
on the current drawing is replaced by  
the incoming symbol with the same name.  
(This is the same as the "rename redefined"  
command on the MISC CMD MENU.)
- Note: This does not apply to the i command  
because that command will not permit you to  
read in a symbol with the same name as an  
existing symbol.  
Default: rename-symbols ON

input-path

When the I command is given, DRAFT will display a menu which contains a list of all of the files in the specified path which have a .DP or .DR extension. If you have this command in your profile more than once, when you type I you will receive a menu listing all the specified paths. If the argument is /Searchlist, the directories in your searchlist will be used (see the GRAPH/NET Technics Manual for a description of Searchlist). To specify the current path (the directory in which the current drawing is located), use .>.

Example: input-path :DRAFTNET>

symbol-inputs

This command is like the "input-path" command above, except that it works with the i command and, after you choose a file, DRAFT lists symbols which are included in the file.

Example: symbol-path :DRAFTNET>

font

DRAFT will append the specified font to the font table on each new drawing. The argument should be in the same format as that required for the f command.

Example: gacha l3 r o roman-complex.vft

**\*\*DO NOT EDIT DEF-FONT\*\***

layer

DRAFT will append the specified layer to the layer table on each new drawing. The argument is a layer name followed by the attributes--a maximum of three characters from the set [r w o] meaning Readable, Writable, Output-able. If the letter is present, the attribute is ON.

Default: layer Standard rwo

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- def-layer** This statement performs the same function as layer explained above, except that the specified layer is then used as the default layer.  
Default: def-layer Standard rwo
- def-separation** This statement will set default separation spacing for parallel lines.  
Example: def-separation 12
- def-thickness** DRAFT will use the specified thickness as the default for lines, circles and splines.  
Default: def-thickness 1
- checkpoint** After the specified number of keystrokes in a window, DRAFT will write the window to a checkpoint file.  
Default: checkpoint 100
- gravity** DRAFT will use the specified gravity as the default. Higher numbers mean stronger gravity. A setting of 0 means do not apply gravity at all.  
Default: gravity 5
- replace-grids** If ON, all mouse grids contained in a file that is read in will replace the current grids EXCEPT grid value 1.  
Default: replace-grids OFF

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- plot-port** This statement specifies the plot port. The default is RS232 Port A for PERQ1 and RS232 Port B for PERQ2 and T2.  
Example: plot-port Port B
- use-raster** If OFF, raster-op will not be used.  
Default: use-raster ON
- begin-window** DRAFT will create a new window. The argument consists of four numbers which represent the coordinates of the lower left and upper right corners. Coordinates are x, y parts. The default is a full-size window--(0,0) at the bottom left of the screen and (767,1023) at the top right. Between this statement and the end-window statement, you may place only the commands shown in the section below.  
Default: begin-window 0 0 767 1023 (Portrait)  
begin-window 0 0 1279 1023 (Landscape)
- mouse-grid** This statement allows you to specify the default grids within the begin-window end-window set.  
Default: mouse-grid 3
- extra-grid** This statement allows you to add extra mouse grid sizes to the list of snap grids for that window.  
Example: extra-grid 6
- end-window** This statement ends the special window mode invoked with the above statement.  
Example: end-window

clip-press-on-window      If ON, a print (press) from the plotter will include only the portion of the drawing that is visible in the window (it is clipped (cut off) at the window boundaries). If OFF, the whole drawing is printed.  
Default: clip-press-on-window OFF

#### Window Commands

Between a begin-window and an end-window statement, you may place the following command if you would like. Other commands will not be recognized. Each command will apply only to that window.

scale                      DRAFT will use the specified scale for the new window. A real number must be used.  
Default: scale 1.0

mouse-grid                DRAFT will use the specified mouse grid for the new window.  
Default: mouse-grid 3

extra-grid                Specifies additional mouse grid.  
Example: extra-grid 12

display-grid              DRAFT will use the specified display grid in the new window.  
Default: display-grid 6

show-grid                If ON, the display grid will be visible in the new window.  
Default: show-grid OFF