Chapter 4 Creating a Display

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Chapter Overview

This chapter provides a detailed description of the various commands and procedures that NCSA Layout provides for the creation of a display.

The chapter assumes that you are familiar with the Macintosh user interface. For detailed instructions regarding use of the mouse, menu bars, or dialog boxes, please refer to your Macintosh user's guide.

Loading Images

To load an image that has been saved in either a raw raster, PICT or an HDF file into NCSA Layout, select Load Image from the File menu or press -I. Or, paste an image from the Clipboard into NCSA Layout by choosing Paste from the Edit menu or pressing -V. To load a picture into NCSA Layout, choose Load Picture... from the File menu.

Loading a PICT File

To load a picture from a PICT file into NCSA Layout, choose Load Picture from the File menu. The loaded picture is not technically an image, but a picture object. See the section entitled “Picture Objects.”

Loading an ASCII File

To load an image from a non-HDF ASCII file:

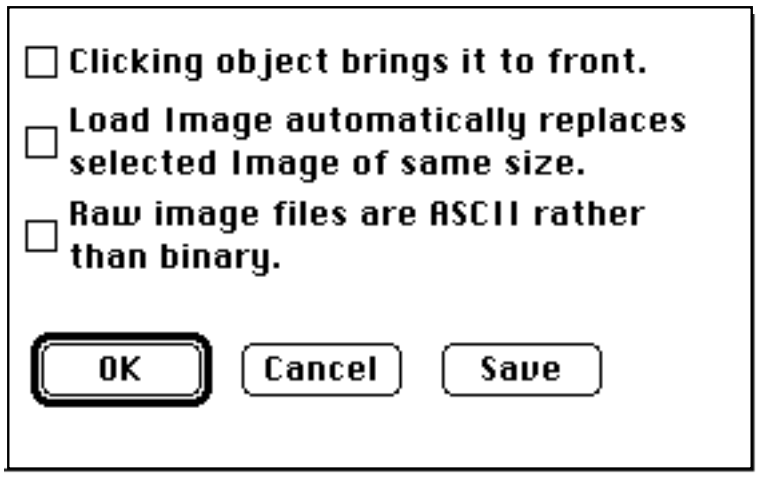
1. Select Preferences from the Edit menu. The Preferences dialog box, shown in Figure 4.1, appears.

2. Select the option *Raw image files are ASCII rather than binary* by clicking in the checkbox that precedes it.

3. Click OK to enable this option for this session with NCSA Layout only. Click Save to save this option so that next time you invoke NCSA Layout, it is enabled by default. Click Cancel to abort the change.

4. Load the ASCII image using the Load Image command. If the dimensions for the image are not found in the filename, a dialog box appears and requires that you specify the dimensions before the image is loaded. See “Specifying the Dimensions of Raw Files” in Chapter 2.

Figure 4.1 Preferences Dialog Box

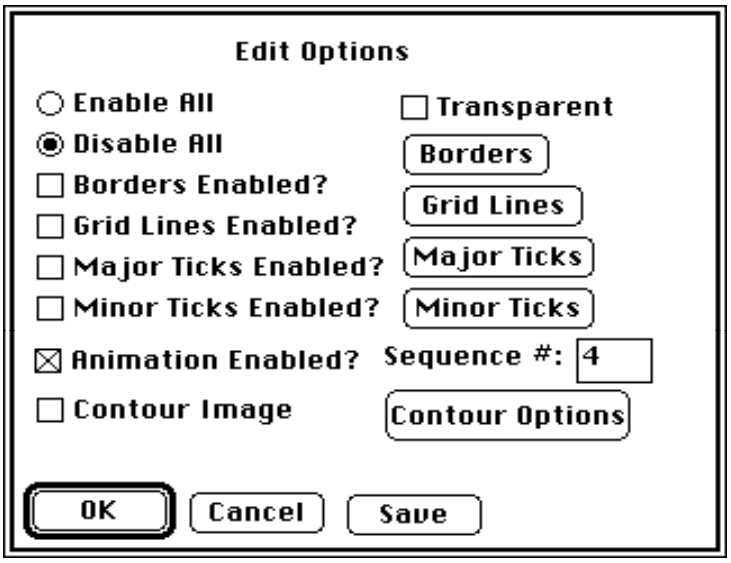


Annotating an Image

NCSA Layout offers several options for altering the image and its surrounding canvas.

In Chapter 1 you learned that double-clicking on an image calls up a dialog box. This is the Edit Options dialog box which you will use to create a border for your image and annotate it with grid lines and tick marks. The Edit Options dialog box is shown in Figure 4.2.

Figure 4.2 Edit Options Dialog Box



The Edit Options dialog box includes buttons for each of the options for editing an image.

To edit an image, click one of these buttons and make the appropriate specifications. After you have done so, you are returned to the Edit Options dialog box to *enable* the options you chose. For example, if you click the Borders button and specify how the image is to be bordered, you must also check Borders Enabled in the Edit Options dialog box before the image will be bordered. In addition, the Edit Options dialog box contains the Transparent and Contour Image options. The former allows you to make objects transparent for easy overlay. The latter allows you to overlay your raster image with a contour plot using user-specified contour colors, and transparent or user-specified colored background. For information regarding the Transparent option, see “Making Objects Transparent. For information regarding the Contour choices, see “Working with Contours.”

The following sections describe the procedures for using the Edit Options dialog box to annotate your displays.

Creating a Border

To annotate or highlight your image with a border:

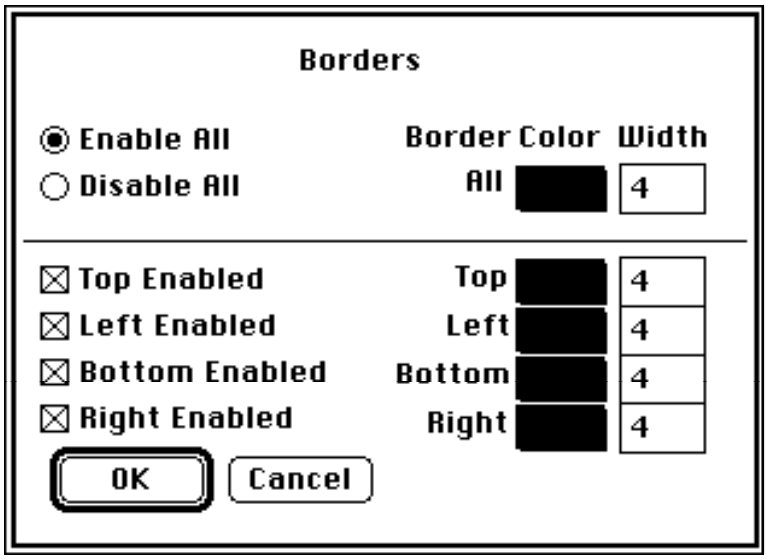
1. Call up the Edit Options dialog box. To do so, double-click on the image

that you wish to modify, or select the image and choose Edit Object from the Edit menu or press -E.

2. Click the Borders button to view the options that Layout provides for the creation of borders.

The Borders dialog box that appears is shown in Figure 4.3. This dialog box allows you to determine which sides of your image will be bordered, and the width and color of the border for each side.

Figure 4.3 Borders Dialog Box



At the upper-left corner of the dialog box are two radio buttons—one is labeled *Enable All* and the other *Disable All.*
To border all sides of an image with borders of the same color and width:

1. Click the Enable All button. This automatically checks all of the boxes directly beneath it, specifying that all sides of the image will be bordered.

2. Click the Border Color box labeled All and drag through the pop-up color bar menu to select a color for the borders. This color bar menu reflects the range of the current palette. The box at the bottom of the color bar menu indicates which color you have selected, and the number above this box indicates the position of the selected color in the palette, where individual color components range from 0 to 255.

3. Select the Width box labeled All by dragging from one end of the box to the other or by double-clicking within the box.

4. Enter the desired width, in number of pixels.

To cancel the borders feature for an image, click Disable All. When you click Disable All, all of the boxes directly beneath it are unchecked, indicating that no side of your image will be bordered.

To border only some of the sides of your image, or to specify different characteristics for the borders:

1. Check the boxes that correspond to the sides that you want bordered; these boxes are Top Enabled, Left Enabled, Bottom Enabled, and Right Enabled.

2. Select the box in the column Width of the row that corresponds to the border that you want to affect—Top, Left, Bottom, or Right—by dragging from one end of the box to the other or by double-clicking within the box.

3. Enter the desired width, in number of pixels.

4. Click the Color box of the row that corresponds to the border that you want to affect—Top, Left, Bottom, or Right—and drag through the pop-up color bar menu that appears to select a color for the borders.

5. Click OK or press RETURN after you have specified the number, width, and color of the borders. The Edit Options dialog box again appears.

6. Check the Borders Enabled box.

7. Click OK or press RETURN to enable the borders for this session only and return to the display. Click Save to save the characteristics, so that next time you call up the Edit Options dialog box, they are specified by default. Click Cancel to abort your changes.

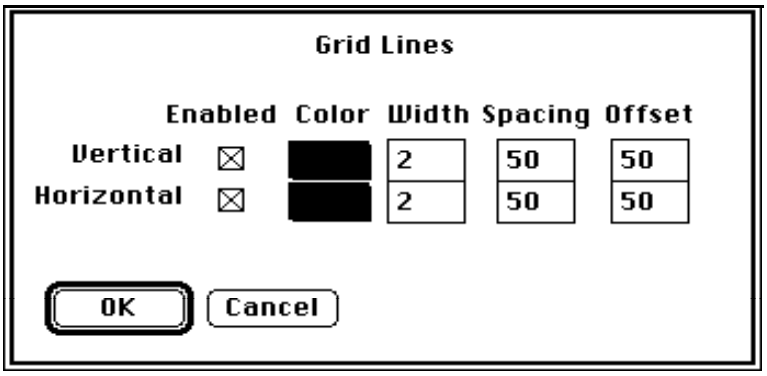
Inserting Grid Lines

To position grid lines on an image:

1. Double-click on the image to call up the Edit Options dialog box.

2. Click the Grid Lines button to view the options that NCSA Layout provides for grid lines. The dialog box that appears is shown in Figure 4.4.

Figure 4.4 Grid Lines Dialog Box



3. Check the Vertical and Horizontal boxes that appear under the Enabled column to indicate whether you want vertical, horizontal, or

both vertical and horizontal grid lines to appear on the image.

4. Click the Color box of the row that corresponds to the grid lines that you want to affect—Vertical or Horizontal—and drag through the pop-up color bar menu that appears to select a color for the grid lines.

5. Select the box in the column Width of the row that corresponds to the grid lines that you want to affect—Vertical or Horizontal—by dragging from one end of the box to the other or by double-clicking within the box.

6. Enter the desired width, in number of pixels. The *width* of a grid line is its thickness in pixels.

7. Specify the spacing and offset, in number of pixels, in the same manner as you specified the width. *Spacing* is the number of pixels that appear between each grid line. *Offset* is the number of pixels that appear between the left or bottom edge of the image and the first grid line.

8. Click OK or press RETURN after you have specified the color, width, spacing, and offset of the grid lines. The Edit Options dialog box again appears.

9. Check the Grid Lines Enabled box.
10. Click OK or press RETURN to enable the grid lines for this session only and return to your display. Click Save to save the characteristics, so that next time you call up the Edit Options dialog box, they are specified by default. Click Cancel to abort your changes.

Inserting Major and Minor Ticks

To insert major or minor ticks on an image:

1. Double-click on the image to call up the Edit Options dialog box.

2. Click the Major Ticks or Minor Ticks button, respectively.

3. Specify the color, width, spacing, offset, length, and direction of the ticks, in the dialog box that appears.

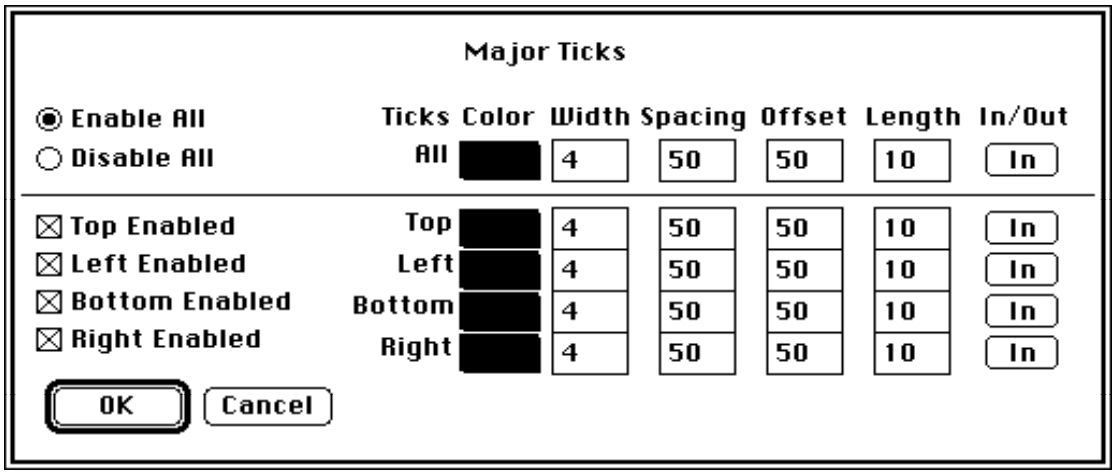
4. Click OK or press RETURN. The Edit Options dialog box again appears.

5. Check Major Ticks Enabled or Minor Ticks Enabled, respectively.

6. Click OK or press RETURN to enable the ticks for this session only and return to your display. Click Save to save the characteristics, so that the next time you call up the Edit Options dialog box, they are specified by default. Click Cancel to abort your changes.

Figure 4.5 depicts the Major Ticks dialog box.

Figure 4.5 Major Ticks Dialog Box



The two radio buttons, Enable All and Disable All, function as those in the Borders dialog box discussed earlier. That is, you can specify that ticks appear on all or none of the sides of your image by clicking Enable All or Disable All, respectively.

To insert ticks on only some of the sides of your image, check the boxes that correspond to the sides on which you want the ticks to appear; these check boxes are Top Enabled, Left Enabled, Bottom Enabled, and Right Enabled.

You may also specify the color, width, and length of the set of ticks that appear on any or all of the sides of the image. To standardize the colors, widths, or lengths of all the ticks, check the box in the column Color, Width, or Length, respectively, in the row All.

The check boxes in the Color and Width columns function in the same manner as their counterparts in the Borders dialog box, discussed in the section entitled “Creating a Border.” Specifically, when you check a box in the Color column, a menu appears containing a color bar that reflects the range of the current palette. Drag through this color bar to select a color for the ticks. To specify the width of ticks, select the appropriate box in the Width column and enter the desired width in number of pixels.

Likewise, to standardize the spacing, length, or offset of all of the ticks, select the box of the appropriate column in the row All and enter the desired value in number of pixels.

To specify that all of the ticks point inward from the edge of the image, click the button in the In/Out column of the row All. The button should now read *In*. Clicking this button again causes all of the ticks to point outward from the edge of the image and changes the button to read *Out*.

You can alter the color, width, spacing, length, offset, or direction of individual sets of ticks by using the text boxes and buttons that correspond to the side of the image that you wish to modify. These function in

the same fashion as those described above and are located in the rows Top, Left, Bottom, and Right.

Pasting Annotations

To copy the annotations from one image and paste them on another:

1. Select the image whose annotations you want to copy.
2. Choose Copy from the Edit menu or press -C.
3. Select the image you want to annotate.
4. Choose Paste Annotations from the Edit menu.

Switching Images

NCSA Layout allows you to replace an image with an image of the same size while applying the annotations from the former to the latter.

To replace an image with one of the same size:

1. Select the image to be replaced by clicking on it.
2. Choose Load Image from the File menu or press -I. In the directory dialog box that appears, select and open the file that contains the desired image. If this image is of the same size as that selected in Step 1, a dialog box appears to verify the switch; if the image is of a different size, the switch is not made.
3. Click Yes or press RETURN if you want the new image to replace the selected image. Click No if you want to add the new image to the display without replacing the selected image. Click Cancel to abort the process altogether.

Overriding the Switching Acknowledgment

If you frequently replace images of the same size, you may want to avoid being prompted to OK the process each time. To instruct NCSA Layout to automatically switch a selected image with a new image of the same size:

1. Choose Preferences from the Edit menu. The Preferences dialog box appears.
2. Check the option *Load Image automatically replaces selected image of same size.*
3. Click OK or press RETURN to enable this option for this session with NCSA Layout only. Click Save to save this option so that next time you invoke NCSA Layout, it is enabled by default. Click Cancel to abort the change.

Pasting Images from the Clipboard

You can paste images into NCSA Layout that were created in applications such as NCSA Image and NCSA DataScope, and pictures created

with non-NCSA software such as MacDraw.

NCSA Layout interprets images created in NCSA applications as raster images, which can be edited and annotated just as if you loaded them using the Load Image command. It interprets pictures from non-NCSA software as picture objects. See the section under “Manipulating Objects.”

Working with Contour Plots

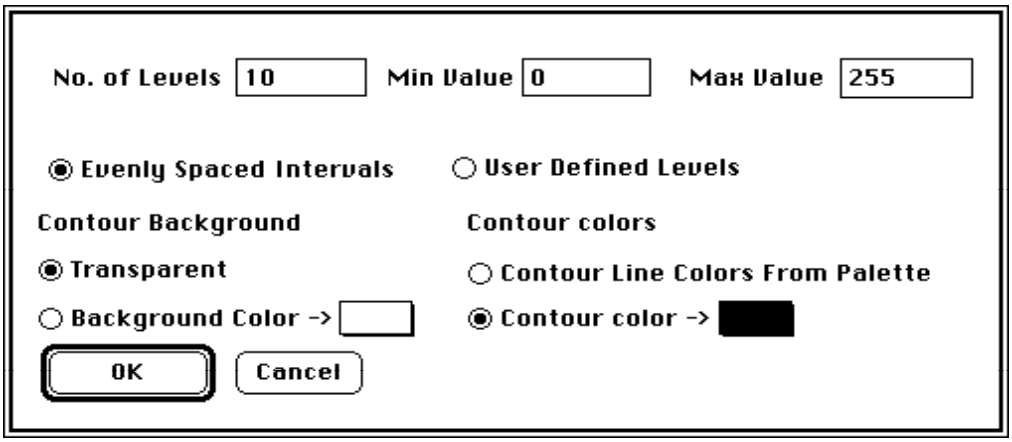
A *contour plot* represents a matrix of data values by drawing contour lines between areas of differing contour levels. A *contour level* is a range of data values that you want distinguished from other ranges of values.

To generate a contour plot for your image data:

1. Select the Contour Options button from the Edit Options dialog box.

The dialog box that appears is shown in Figure 4.6.

Figure 4.6 Contour Plot Dialog Box



2. Define spacing for the contour levels and vary the number of levels drawn.

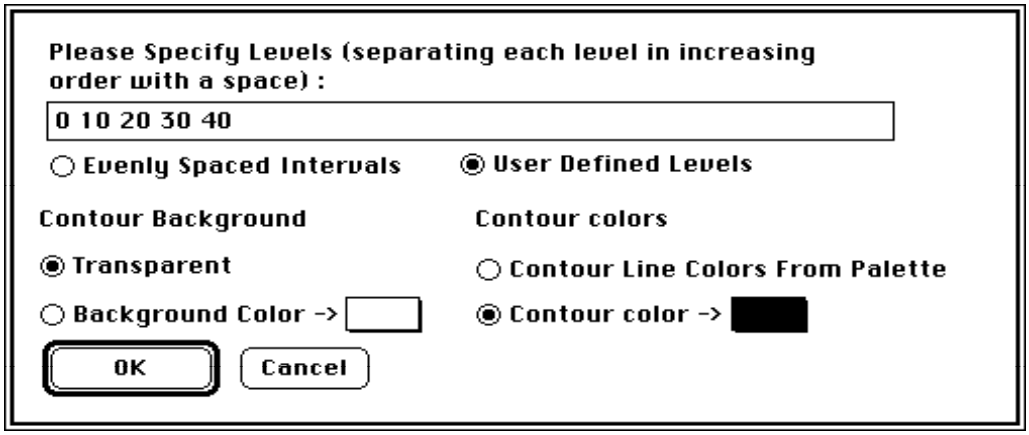
- Select Evenly Spaced Intervals or User Defined Levels to determine the spacing between contour lines.

  If you select User Defined Levels, the dialog box pictured in Figure 4.7 appears. Enter the spacing you desire in number of pixels, spacing between each as directed.

- Specify a number of contour levels and the maximum and minimum data values in the appropriate boxes.

  NOTE: NCSA Layout does not allow you to specify fewer than two contour levels.

Figure 4.7 User-Defined Contour Levels



3. Choose the contour background by selecting the radio buttons labeled transparent for a transparent background, or background color for a colored background.

   If you choose a colored background, you must also click the color box labeled background color and drag through the pop-up color bar menu to select a color for the contour background. This color bar menu reflects the range of the current palette. The box at the bottom of the color bar menu indicates which color you have selected, and the number above this box indicates the position of the selected color in the palette, where individual color components range from 0 to 255.

4. Choose the line color of your contour plot by selecting either the radio button labeled Contour Line Colors From Palette or Contour color. The former option plots the contour plot using colors from the current palette. The color(s) used to represent the contour line is simply the color(s) in the palette indexed by the contour level number(s) you've entered.

   The Contour option button allows you to designate a single color from the current palette. See step 3 above for information on selecting a color.

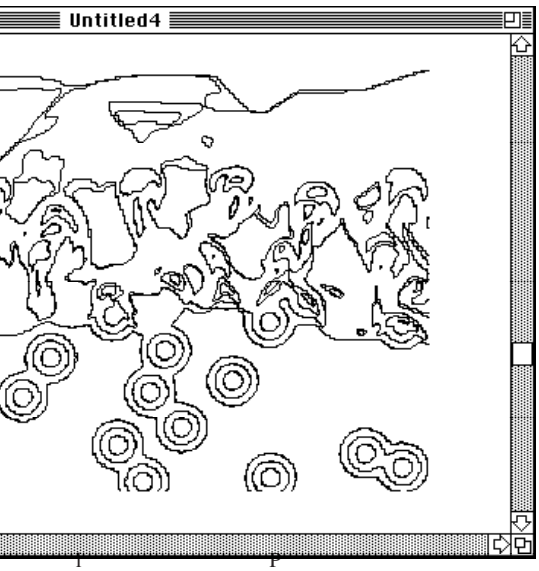
5. Click OK or press RETURN. Click Cancel to purge your entries.

6. Check the box labeled Contour Image in the Edit Options dialog box.

7. Click OK to save the designated selections for this particular Layout session or Save to save the selections for future sessions. Click Cancel for the program to ignore all entries.

A contour plot of your data is plotted in the image window according to your specifications. A sample contour plot is shown in Figure 4.8.

Figure 4.8 Sample Contour



Overlaying an Image with a Contour Plot

To overlay your raster image with a contour plot:

1. Generate a contour plot as outlined in the above section.

2. Copy the contour plot by dragging around the image with the mouse and selecting either cut (-X) or copy (-C) from the Edit menu.

3. Load the original image, from which Layout derived the contour plot, into a new Layout display by following the steps in this chapter's section, "Loading Images."

4. Choose Paste from the Edit menu or press -V.

5. Place the contour plot atop the raster image by dragging or using NCSA Layout's alignment commands. See "Aligning Objects."

NOTE: There are many ways in which to overlay and edit images; therefore, the steps outlined above are just guidelines.

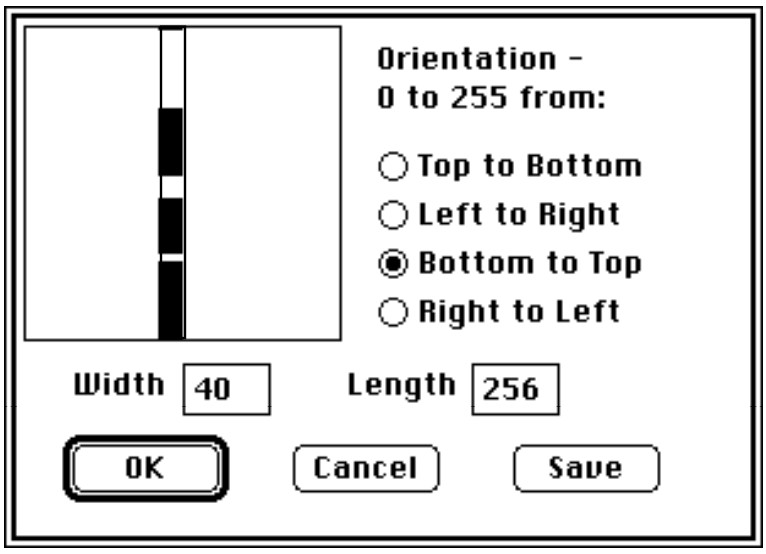
Color Bars

To display a color bar of the current palette with your image, choose New Color Bar from the Special menu. NCSA Layout does not limit the number of color bars you can insert.

Initially, the color bars displayed by NCSA Layout are 40 pixels wide, 256 pixels long, and vertically oriented, that is, with the palette entry 0 at the top and 255 at the bottom.
To change this size or orientation, select the color bar and choose Edit Object from the Edit menu or press -E, or simply double-click on the color bar. The Color Bar dialog box appears

(see Figure 4.9).

Figure 4.9 Color Bar Dialog Box



1. Specify the orientation by clicking the appropriate radio box. The image in the square box at the left rotates to reflect how your specification will affect the orientation of the color bar.

2. Specify the width or length by entering the desired values, in number of pixels, in the text boxes labeled Width and Length, respectively.

3. Click OK or press RETURN to change the characteristics of this particular color bar. Click Save to save this option so that any subsequent color bars you insert display the characteristics you specified here. Click Cancel to abort the change.

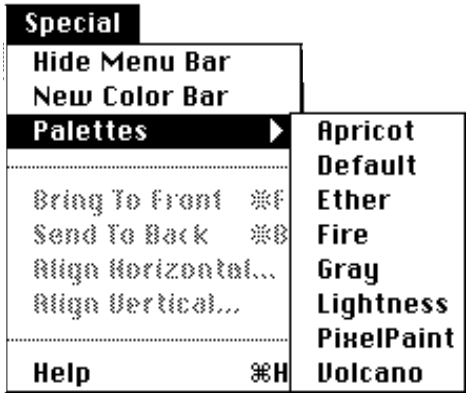
Working with Palettes

NCSA Layout provides several means whereby you may change the palette used in your display. You can use one of several palettes provided with the program, load customized palettes such as those created in NCSA PalEdit, or paste palettes that were copied onto the Clipboard from applications such as NCSA Image or NCSA PalEdit.

Loading Palettes

To use a palette that has been built into the NCSA Layout program, select one of the palettes contained in the Palettes submenu under the Special menu, shown in Figure 4.10.

Figure 4.10 Palettes Submenu



To load a palette stored in a raw palette or HDF file:

1. Choose Load Palette from the File menu or press -L. A directory dialog box appears.

2. Select and open the desired palette.

To paste a palette that has been copied onto the Clipboard, select Paste from the Edit menu or press -V.

Copying and Pasting Palettes

To copy the current display's palette for use in another display or application, such as NCSA DataScope, NCSA Image, or NCSA PalEdit, select Copy Palette from the Edit menu or press -K.

NOTE: Copying and pasting the palette is not equivalent to copying and pasting a color bar. The Copy Palette command copies the current display's color lookup table (CLUT) resource. The Paste command initializes the application's color table using this CLUT resource.

Editing Text

In Chapter 1 you learned how to bring up a text box in which you can enter conventional text by typing on the keyboard. You can also enter text by pasting text from the Clipboard into a text box or selected text object.

The various text styles and options NCSA Layout provides for editing and displaying text are explained in the following sections: "Selecting Text," "Justifying Text," "Adjusting Text Margins," "Choosing Text Fonts, Sizes, and Styles," Coloring Text," and "Cutting, Copying, Clearing, and Pasting Text."

Selecting Text

You may determine characteristics of text either before or after it has been inserted.

To select characteristics before typing text:

1. Bring up a text box.

2. Choose characteristics according to the instructions presented in the following sections.

3. Enter text by typing on your keyboard or pasting text from the Clipboard. Note that the characteristics you specify in this manner are set as the default for new text insertions until you specify otherwise.

To alter selected text after you have typed it in the text box:

1. Select the text you want to modify by dragging the pointer across it and releasing the mouse button. You may also select a single word by double-clicking on it. Note that the text that you have selected is highlighted.

2. Choose characteristics according to the instructions presented in the following sections. Note that the commands affect only the text that you have selected and do not alter the default characteristics for text.

To edit the text in a text object—a text insertion whose text box is no longer visible—select it and choose Edit Object from the Edit menu or press -E, or simply double-click on it. This calls up the text box, so you can edit the text according to the instructions above. (Figure 1.6, "Text Displays," depicts the differences between text objects and text boxes.)

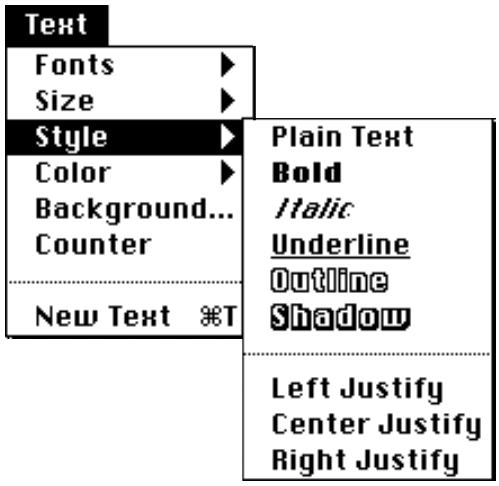
NOTE: NCSA Layout allows you to select and edit multiple text objects simultaneously (see "Manipulating Objects"). For example, you can simultaneously change the font of all the selected text, or delete all the text objects, with a single operation.

Justifying Text

The position of the blinking cursor in a text box indicates the point of text insertion and the point from which the text will be justified. Although NCSA Layout justifies text from the left end of the text box by default, you may change the manner in which the text is justified by selecting one of the three options—Left Justify, Center Justify, or Right Justify—from the Style submenu that appears under the Text menu, shown in Figure 4.11.

NOTE: Justification applies to an entire text box, not individual lines within the text box. For example, you cannot justify the first line in a text box by its center and the next line by its right edge.

Figure 4.11 Style Submenu



Adjusting Text Margins

You can resize text boxes before or after inserting text. Try typing a lengthy sentence into a text box. You will notice that the text box extends itself vertically to accommodate an insertion that is longer than the initial text box. Now resize the text box to display the entire insertion, for instance, on a single horizontal or vertical line.

To adjust the margin, position the cursor on the shaded rectangle located at the right end of the text box, and drag the shaded region to the right or left. Dragging the shaded region vertically has no effect upon the text box or inserted text.

Choosing Text Fonts, Sizes, and Styles

NCSA Layout allows you to vary your text fonts and styles to create a clearer, more interesting display. Select a font from the Fonts submenu from the Text menu. The Fonts submenu should contain all of the fonts that are currently installed on your system.

To choose a size for the font that you have chosen, select the desired point size from the Size submenu under the Text menu. Likewise, you may select specific styles such as Underline or *Italic* from the Style submenu under the Text menu. In addition, you may select more than one style from the Style submenu and thereby combine text styles, as demonstrated in Figure 4.11.
NOTE: You can use Apple's resource editor, ResEdit, to install fonts other than those currently listed under your fonts submenu. For information regarding other ways to install fonts, refer to your Macintosh user's guide.

Coloring Text

NCSA Layout allows you to apply any color from the current palette to the text. To alter the color of key words or headings, for example:

1. Select the word or words you wish to modify.

2. Select Color from the Text menu. The Color submenu contains a color bar that reflects the range of the current palette and functions in the same manner as those previously introduced.

3. Drag through this color bar to select a color for the selected text.

Coloring Text Background

The Layout program also permits you to make the text background transparent or specify any color from the current palette and apply it to the text background.

To make the background text transparent:

1. Select the desired text box

2. Choose Background... from the Text menu. The Text Background Color dialog box appears (Figure 4.12).

3. Select the radio button labeled Transparent.

4. Click OK. The text background is now transparent, allowing the image background to remain in tact.

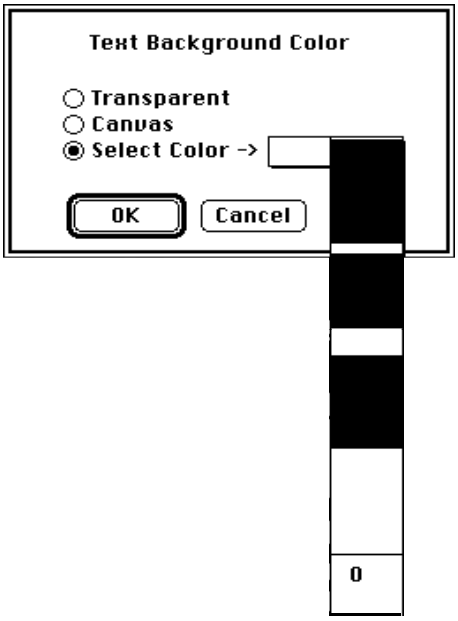
NCSA Layout colors the text background in the following two ways:

1. Choose the Canvas option from the Text Background Color dialog box to instruct the program to match the text background with the canvas color. (See “Photographing Your Display” in this chapter for instructions on changing the canvas color.)

2. Choose the Select Color option from the same box to pick a color from the current palette to color the text background.

   • Click the color box, and a pop-up palette bar reflecting the current palette appears (Figure 4.12).

Figure 4.12 Text Background Color Dialog Box



- Depress the mouse button and drag the mouse through the colors until the pointer rests on the desired color.
- Release the button.
- Click OK.

Cutting, Copying, Clearing, and Pasting Text

Cutting removes selected text from the display and places it on the Clipboard. Copying copies selected text and places it on the Clipboard. Clearing removes selected text from the display just as cutting does, but does not place it on the Clipboard. After you have cut or copied text, you can paste it into other text boxes or into other applications.

To cut text:

1. Select a word to be cut by double-clicking on it or select several words by dragging across them.
2. Choose Cut from the Edit menu or press -X.

To copy text, select the text and choose Copy from the Edit menu or press -C. To clear text, select it and choose Clear from the Edit menu or press DELETE.

To paste text into NCSA Layout, first bring up a text box by clicking on the canvas. Then select Paste from the Edit menu or press -V.
NOTE: Text that has been rotated in MacDraw II and pasted into NCSA Layout retains its original characteristics and can later be copied and

pasted back into MacDraw II for editing.

For information on the Counter option located in the Text menu, refer to Chapter 2, “Laybat Tool.”

Manipulating Objects

The operations in this section apply to the various objects in NCSA Layout: picture objects, images, color bars, and text objects.

Picture Objects

Picture objects are graphics that have been created and copied onto the Clipboard in another application, other than NCSA Image and NCSA DataScope, and pasted into NCSA Layout.

NOTE: Images that are copied onto the Clipboard in NCSA Image and NCSA Datascope are pasted into NCSA Layout as images, not picture objects.

Picture objects can also be created by selecting a region of a display in NCSA Layout, copying it onto the Clipboard, and then pasting it back into NCSA Layout. For information regarding selecting a region of the display, see “Selecting a Region of the Display.”

A picture object pasted into NCSA Layout from another graphics application retains all of its original characteristics and may be transferred back to the original program for editing. For example, a picture object that was grouped in MacDraw and pasted into NCSA Layout may be transferred back to MacDraw and ungrouped and edited.

When a picture is pasted into NCSA Layout, each color in the picture that is not in the current palette for the NCSA Layout display is drawn in the color from the palette that most closely approximates the picture color. For example, a red line created in PixelPaint, copied onto the Clipboard, and pasted into NCSA Layout, is drawn in the palette color that most closely matches the original color of the red line; if the NCSA Layout palette has only gray entries, then the line is drawn in gray.

Changing a Picture Object into an Image

Picture objects cannot be edited in NCSA Layout but may be manipulated in any way that is common to all the other objects; that is, they may be moved, copied, duplicated, aligned, cleared, and so forth.

You can, however, convert picture objects into images, which *can* be edited in NCSA Layout.

To make a picture object into an image:

1. Select the picture object.

2. Choose Pict to Image from the Edit menu.

If the picture object is associated with a palette other than the current palette, a dialog box appears and asks you to specify whether to replace the original palette with the current palette. This option allows you to retain the picture's original colors.

The resulting object is an image object which may be treated as any other image as described in the section entitled "Annotating an Image."

Selecting Objects

To select a single object, click on it.

NCSA Layout allows you to select multiple objects and simultaneously perform operations on them. For example, you can move several selected images as a group by dragging any one of them. There are three ways to select more than a single object:

1. Press the mouse button, drag a selection box around the objects, and release the mouse button.

2. Hold down SHIFT while you click on each object.

3. Choose Select All from the File menu or press -A. This selects all of the objects in the display window.

Solid squares outline an object to indicate that it has been selected. Where applicable, any command you issue or operation you perform affects each of the selected objects.

Moving Objects

To move objects to another location:

1. Select the objects.

2. Drag them to the desired location on the canvas.

Layering Objects on the Screen

The number of images you can load into NCSA Layout is limited only by the amount of memory you have available. When you are working with multiple images, you will probably want to layer them. The same applies to text objects and color bars.

NCSA Layout allows you to determine which objects appear in the foreground and which appear in the background of your display. To layer objects on the screen:

1. Select the objects.

2. Choose Bring To Front from the Special menu or press -F to bring them to the foreground.

   Choose Send To Back from the Special menu or press -B to send them to the background.

For example, you may use the Send To Back command to reveal a small image that you have obstructed by inserting a larger image over it. To bring the obstructed image to the foreground, select the obstructing image, and choose Send To Back from the Special menu or press -B. This positions the larger image behind the smaller image.

An object that you have sent to the background remains in the background until you bring it to the foreground.

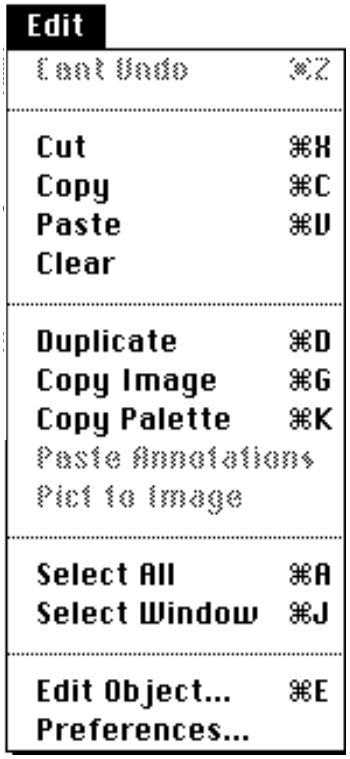
To instruct the NCSA Layout program to bring to front whatever object you click on:

1. Select the Preferences command under the Edit menu, shown in Figure 4.13.

2. Check the option *Clicking object brings it to front* in the dialog box that appears.

3. Click OK or press RETURN to enable this option for this session with NCSA Layout only. Click Save to save this option so that next time you invoke NCSA Layout, it is enabled by default. Click Cancel to abort the change.

Figure 4.13 Edit Menu



Aligning Objects

NCSA Layout includes commands that allow you to center objects over,

under, or to the left or right of each other. For example, to align a text object with an image, select both the text object and the image by holding down the SHIFT key while you click on each, or by drawing a selection rectangle around them. Then choose either Align Horizontal or Align Vertical from the Special menu, depending on whether you want to align the objects along a horizontal or vertical axis.

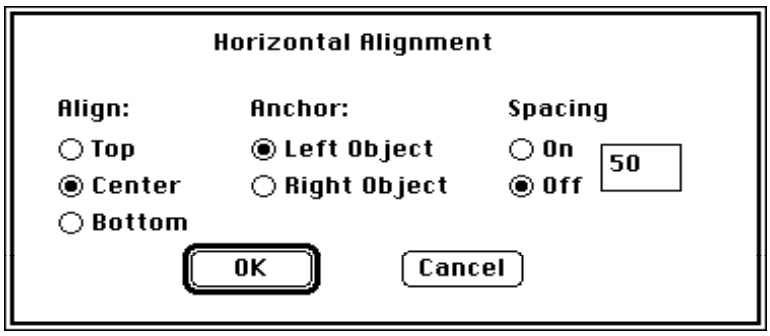
In the dialog box that appears, you may specify how you would like the objects to be aligned; for example, by their top edges.

Horizontal Alignment

To align selected objects along a horizontal axis:

1. Choose Align Horizontal from the Special menu. The Horizontal Alignment dialog box that appears is shown in Figure 4.14.

Figure 4.14 Horizontal Alignment Dialog Box



2. Click the radio buttons labeled Top, Center, or Bottom, to specify whether you want the objects to be aligned by their top edges, centers, or bottom edges.

3. Select Left Object or Right Object, to indicate which of the selected objects the others should be aligned to, the one that appears at the far left or the one at the far right. That object is *anchored.*

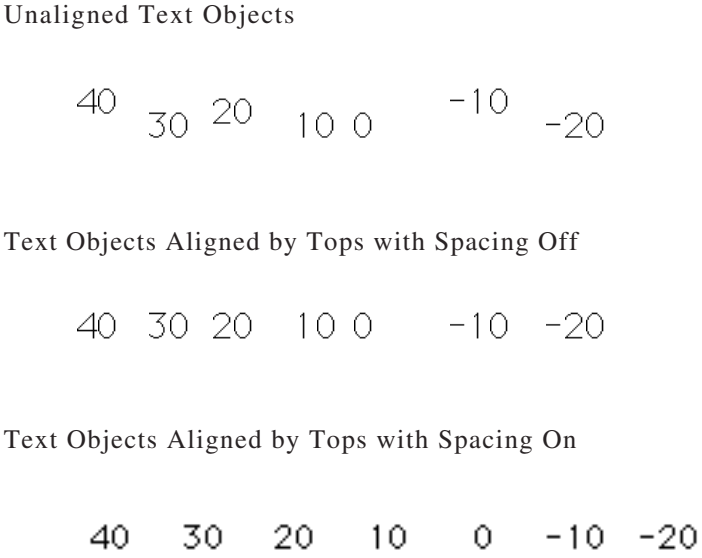
4. Click the On button under the Spacing column and enter the number of pixels you wish to appear between each object by typing in the text box. This evenly spaces the selected objects.

5. Click the Off button to deactivate automatic spacing. Notice that Off is specified for Spacing by default. When Spacing is Off, the objects you selected do not move left or right when aligned.

6. Click OK or press RETURN and the anchored object retains its position while the other objects are aligned according to your specifications.

Figure 4.15 demonstrates the results of aligning seven objects along a horizontal axis by their tops, without and with spacing. In these examples, the left object (40) is anchored.

Figure 4.15 Horizontal Alignment



Vertical Alignment

To align selected objects along a vertical axis:

1. Choose Align Vertical from the Special menu.

2. Check Left, Vertical, or Right in the dialog box that appears, to specify whether you want the objects to be aligned by their left edges, centers, or right edges.

3. Select Top Object or Bottom Object, respectively, to indicate which of the selected objects the others should be aligned to, the topmost or bottommost object; that object is *anchored.*

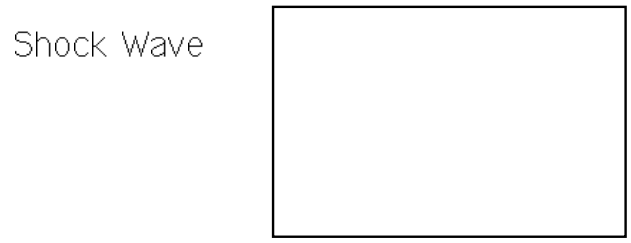
4. Click the On button under the Spacing column and enter the number of pixels you wish to appear between each object by typing in the text box. This evenly spaces the selected objects.

5. Click the Off button to deactivate automatic spacing. Notice that Off is specified for Spacing by default. When Spacing is Off, the objects you selected do not move up or down when aligned.

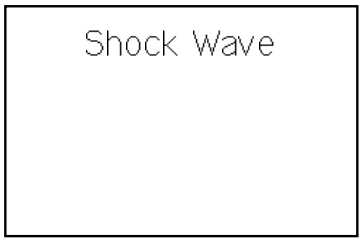
6. Click OK or press RETURN. As with horizontal alignment, the anchored object retains its position and the other objects are aligned according to your specifications.

Figure 4.16 demonstrates the results of aligning two objects along a vertical axis by their centers, with the right object anchored, with and without spacing.

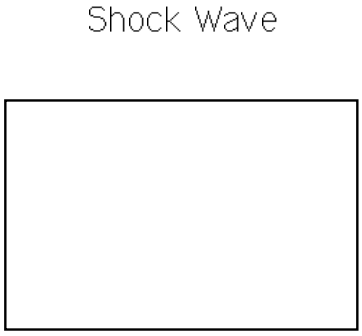
Figure 4.16 Vertical Alignment



Objects Aligned by Centers with Spacing Off



Objects Aligned by Centers with Spacing On



Cutting, Copying, Clearing, Duplicating, and Pasting Objects

The Cut, Copy, Clear, Duplicate, and Paste options apply to selected text, text objects, images, color bars, and picture objects.

Cutting removes a selected object from the display and places it on the Clipboard. Copying copies a selected object and places it on the Clipboard. Clearing, or deleting, removes a selected object from the display just as cutting does, but does not place it on the Clipboard. Duplicating copies the selected object and pastes it into the display.

To cut, copy, delete, clear, or duplicate objects:

1. Select the object(s).

2. Choose Cut, Copy, Clear, or Duplicate from the Edit menu. Or, press -X to cut, -C to copy, DELETE to clear, and -D to duplicate.

After you have cut or copied an object, you can paste it into the current

display or into other applications.

Objects that have been cut, copied, or duplicated (other than picture objects) retain all of the characteristics of their originals; that is, images, text objects, and color bars may be annotated or edited.
To paste the contents of the Clipboard into NCSA Layout, select Paste from the Edit menu or press -V.

NOTE: Copy copies an image and any annotations it contains. To remove the annotations:

1. Call up the Edit Options dialog box.

2. Click Disable All.

3. Click OK or press RETURN.

Or, to bypass this procedure and copy just the base image and not its annotations:

1. Select the annotated image.

2. Choose Copy Image from the Edit menu or press -G.

Making Objects Transparent

NCSA Layout allows you to make images transparent for easy overlay. This feature, combined with the capability of making picture objects into images (see this chapter's section, "Picture Objects") allows you to make picture objects and text transparent. Refer to this chapter's section, "Coloring Text Background," for details on making text background transparent.

To make a picture object transparent:

1. Select the picture object.

2. Choose Pict to Image from the Edit menu.

3. Select the image.

4. Call up the Edit Options dialog box by double-clicking within the image or by choosing Edit Object from the Edit menu. Enable the box labeled Transparent.

5. Click OK or press RETURN. The object is now transparent.

Note that if the picture object was created in NCSA Layout while the canvas was set to a color other than the 0th entry, the object cannot be made transparent.

To make an image transparent, follow Steps 3 through 5 above.

Saving Your Work

NCSA Layout allows you to save the contents of your display window or portions of it as either a raster image, or the entire display as a Layout file. A raster image can be loaded into the program, added to a display, and annotated, but it cannot be opened from the desktop; whereas, a Layout file *can* be opened from the desktop and then edited in the program.

Selecting a Region of the Display

To select a portion of an image or display:

1. Hold down OPTION.

2. Press the mouse button. The arrow cursor becomes a cross-hair cursor.

3. Drag a selection box around the desired portion of the display.

4. Release the mouse button and OPTION key. A rectangular box outlines the selection.

NOTE: Refer to Chapter 2, "Laybat Tool," for animating a section of a display.

To select whatever objects that are contained within the inside boundary of the display window, choose Select All from the Edit menu or press -A. To select the entire canvas, choose Select Canvas from the Edit menu or press -J. A rotating broken line surrounds the entire canvas. Note that the Layout display and the canvas are two separate items. The canvas contains the display.

For example, think of the canvas as a porthole of a ship. Looking straight out of the porthole, you will see a view of water, a harbor, etc. That view correlates to the Layout display. If you enlarge the porthole, or canvas, you can fit more into and see more of the outside view or display.

When you select and copy a region of the display in NCSA Layout using the OPTION key or the Select Window command, the selection is copied as a picture object in PICT format and placed on the Clipboard. You can copy any portion of the display window in this manner and paste it into any other application. For example, you can paste the selection into PowerPoint or Layout for presentations, MacPaint for touching up, and other NCSA applications for viewing. See this chapter's section "Picture Objects."

Saving Selections

To save a selected region of the display:

1. Choose Save As from the File menu. The Save As dialog box appears.

2. Enter a name for the image.

3. Click a radio button to specify a file format. See "Choosing a File Format."

4. Click Save to save the image.

Saving Layout Files

To save your display as a Layout file that you can open from the desktop to continue editing at a later date, choose Save As from the File menu. The Save As dialog box appears and prompts you to name the file.

Choosing a File Format

The Save As dialog box contains six file format options in which to save your layout display. The following information should help you decide when to use the different file formats. For more information regarding the formats, see Chapter 3.

HDF

The HDF (Layout) file saves all the objects and characteristics of the display in an HDF file. If you save the display using the Save command, the resultant file is a Layout file which can be opened from the desktop and edited in NCSA Layout.

Use HDF Image file to save the display as an image to transport into other applications.

Use HDF Image Sequence is currently unavailable in this version.

Use the batch mask file option when creating a batch mask template. Refer to Chapter 2 “Laybat Tool” for more details.

PICT Format

PICT format allows you to port displays or picture objects created in NCSA Layout to other applications. By specifying either PICT (drawing) or PICT (pixels), the resultant file will contain a sequence of drawing commands or pixel commands, respectively. This file may be edited and be opened in any application that reads PICT files. You can load a picture stored in a PICT file into NCSA Layout, but NCSA Layout cannot open PICT files. See “Loading a PICT File” and “Picture Objects.”

Printing Your Image

NCSA Layout allows you to print any of the black-and-white plots. If you are connected to the appropriate printer, NCSA Layout is also able to print color/grayscale images.

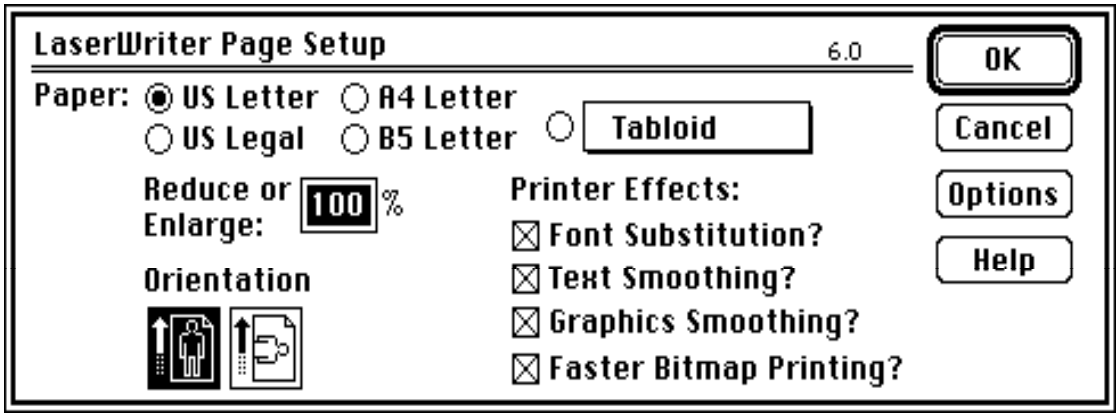
Specifying Page Setup

Specify the page characteristics for printing by selecting Page Setup from the File menu. In the dialog box that appears, you may specify the characteristics of the printed page. A sample page setup dialog box created specifically for the LaserWriter is shown in Figure 4.17. The appearance of the dialog box may vary from system to system depending on your printing device, but most print dialog boxes allow you to specify

the page size, the orientation of the printing, and some special effects. The setup depicted in Figure 4., for example, has options that allow you to choose font substitution, text and graphics smoothing, and faster bitmap printing. Click the Options button for more ways to alter your printed image. Typically, you will not need to use such options when printing from NCSA Layout.

Refer to your Macintosh user's guide for the specific settings to select for your printing device. Also note that you can easy adapt printing specifications to an ImageWriter.

Figure 4.17 Sample Page Setup Dialog Box



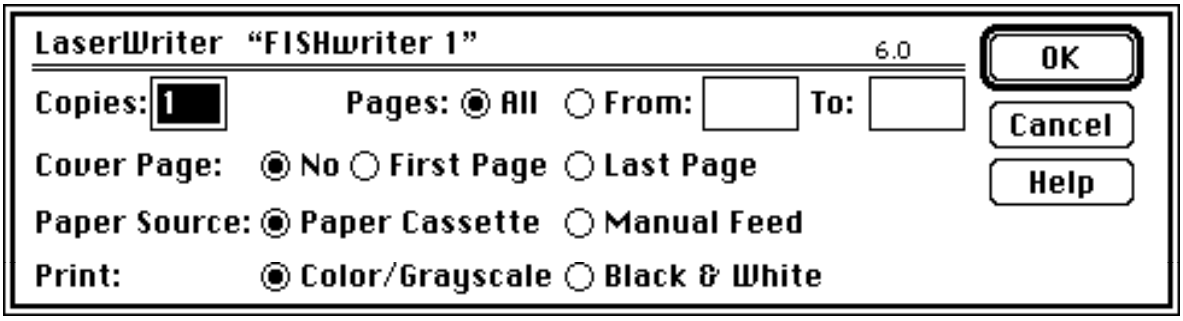
After determining the characteristics for your printout, click OK or press RETURN.

Specifying Print Options

Print your image by activating the image window that you wish to print and selecting Print from the File menu or by pressing -P.

While NCSA Layout creates an image for printing, the cursor becomes a spinning beach ball. When the image is ready to print, a print dialog box appears. This dialog box allows you to specify the format for this particular printing session. A sample print dialog box, tailored specifically for the LaserWriter, is presented in Figure 4.18. Though the print dialog box that actually appears on your screen may differ from this example depending upon your printing device, it generally includes the following parameters: page range, number of copies, and automatic or hand feed. After you have specified the desired page characteristics, click OK or press RETURN to print your image.

Figure 4.18 Sample Print Dialog Box



Photographing Your Display

NCSA Layout provides several features that allow you to modify the appearance of the canvas for photographing purposes. The sections below describe the procedures you should follow to enlarge the canvas to cover the full screen, apply color to the canvas, hide the menu bar and window outline, and photograph the display.

Coloring the Canvas

To apply color to your canvas, select a color from the color bar menu that appears under the CanvasColor menu. This color bar menu reflects the range of the current palette, and functions as those color bar menus previously discussed.

Enlarging the Canvas to Full Screen

Although by default a new canvas covers the entire Macintosh screen, it will appear smaller than the screen when first loaded because you are actually viewing the display contained within the canvas. (See this chapter's section "Selecting a Region of the Display.") To enlarge the display window viewing area so that it covers the full screen, position the pointer in the *zoom box* in the upper-right corner of the window's title bar and click once. To return the display window to its size when loaded in, click the zoom box again. You can also resize the display window using the size box in the lower-right corner of the window.

To change the size of the actual canvas:

1. Select the canvas.

2. Choose Canvas Dimensions from the Windows menu (Figure 4.19). The Dimensions dialog box in Figure 4.20 appears.

Figure 4.19 Windows Menu

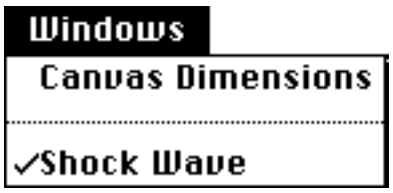
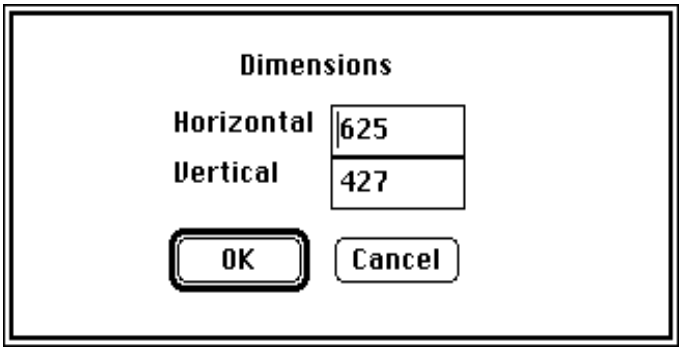


Figure 4.20 Canvas Dimensions Dialog Box



3. Enter values for the horizontal and vertical canvas measurements. (The default values of 625 and 427, respectively, fit the canvas to the screen size of a Macintosh II monitor.)

4. Click OK.

Notice that the Windows menu lists all the canvas names that are opened in the present Layout session. You may easily switch between canvases by selecting them from the Windows list. A checkmark will appear beside the selected canvas. Any changes made in the canvas dimensions will apply only to the selected canvas.

Hiding the Menu Bar and Window Outline

To remove the menu bar and window outline from your display, select Hide Menu Bar from the Special menu. The pointer, menu bar, and window outline remain hidden until you click the mouse button. Now, you can easily photograph the display on your Macintosh with any 35mm camera for presentation-quality pictures and slides.

Photographing the Screen

You can use a film recorder directly interfaced into the computer, such as a Dunn or Mirus, or a 35mm camera to photograph your displays. This section contains some suggestions to help you take quality photographs of your display using your own camera.

1. Select a film with a speed of 100 ASA. NCSA photographers have had good results with Kodak Ektachrome 100 (daylight balanced) film.

2. Set up the camera on a tripod directly in front of the screen. If possible, use a cable release with the camera to minimize shaking.

3. Make sure the camera is aligned squarely in front of the monitor (see Figure 4.21).

4. If possible, use a narrow, or *telephoto*, lens. Wide angle lenses tend to distort the image, whereas telephoto lenses actually flatten it. The distance at which you set the camera will depend on the focal length of the lens.

5. Photograph in the darkest environment possible, to reduce reflection from the monitor.

   NOTE: Since the dimensions of a Macintosh screen are not proportional to those of a 35mm slide, a small area of the monitor will probably be included in full-screen slides. However, if the film is shot in a room-darkened environment, this area will appear as black on the slide.

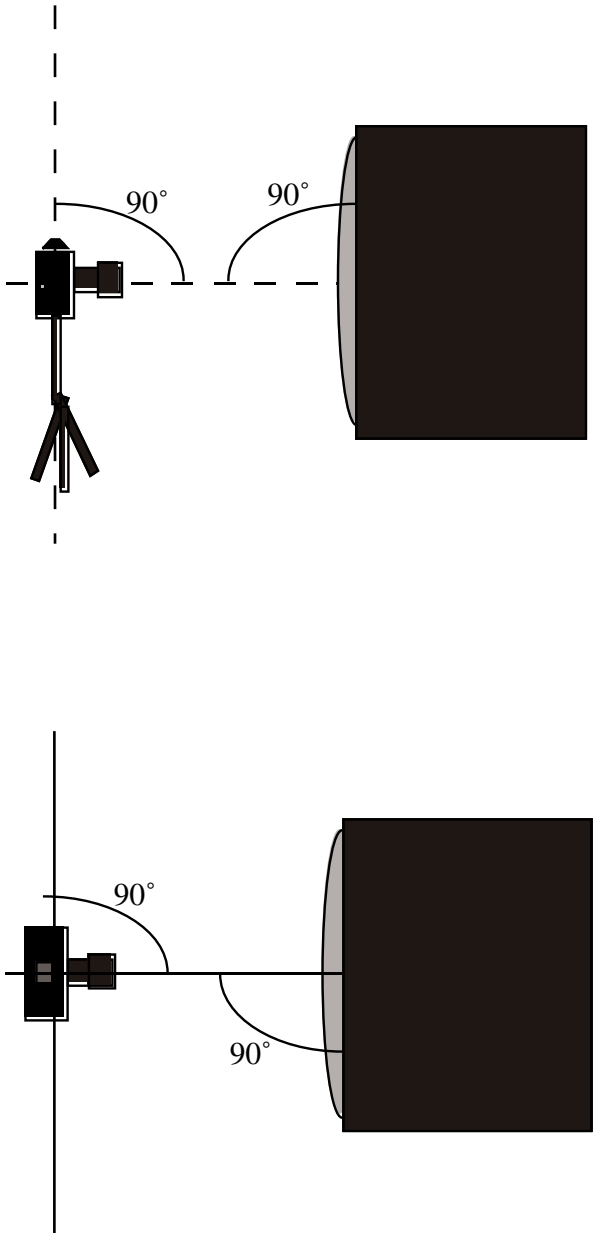
6. Focus on a slightly larger area than what you want for the final display, since the slide holder will probably obscure the periphery of the slide.

7. Select a slow shooting speed. Speeds of 1/60 of a second and faster are too fast for the refresh rates of most screens, and often capture a refresh line on film. A typical exposure setting for most computer screens, using ASA 100 film, is about f2.8 at 1/4 second.

8. If you have an exposure meter on your camera, use it in the following manner: Put a large mid-gray image on your screen; that is, a gray which is roughly half way between the white and black of your screen. (You can use a solid color, or even an image, if you can safely say that the overall brightness is mid-gray—not always an easy judgment.) Take an exposure reading from this screen.

9. Photograph the same display at different exposures to ensure that a properly exposed image is captured. This method of shooting, called *bracketing*, is especially important when you are using slide film, which is very sensitive to light changes.

Figure 4.21 Side and Top Views of Photo Display Setup



Exiting a Display

To exit a display, either quit the Layout application or close the display window. If you have made any changes since the last time you saved the display, a dialog box appears and prompts you to name and save the display.

To close the active display window click in the window's close box, select Close from the File menu, or press -W. To quit the application, choose Quit from the File menu or press -Q.