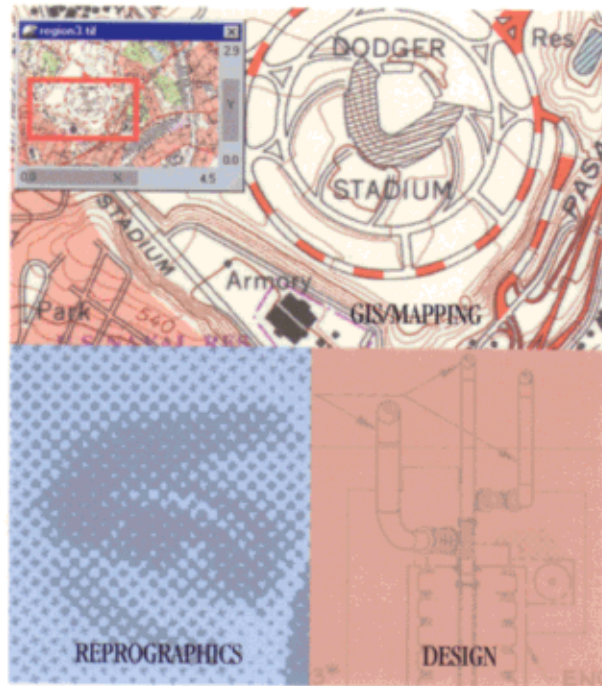


PREDITOR

SCANSMITH™



**FAST
DISPLAY
AND EDIT
OF LARGE
BLACK AND
WHITE,
GRAYSCALE,
AND COLOR
RASTER
FILES**

ANAtch
Imaging Products

Compatible
with Microsoft
WINDOWS® 95
WINDOWS NT™

SCANSMITH PREDITOR User Guide

Version 4.1, November, 1997

Foreword

This document covers the SCANSMITH PREDITOR software product. Action Imaging Solutions believes the information in this document is accurate as of its publication date. Software features are subject to change.

Document Conventions

The following typographical conventions are used throughout this manual:

Text to be entered via the keyboard appears in a monospaced font as follows:
enter this text

Emphasized text appears in italics:

this is emphasized text

Text that cautions the user about actions that may result in injury, equipment or software damage or malfunction, or may interfere with the proper operation of the scanner is preceded by the word **Warning**.

Text that presents useful information or valuable tips may be preceded by the word **Note**.

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PREDITOR User Guide

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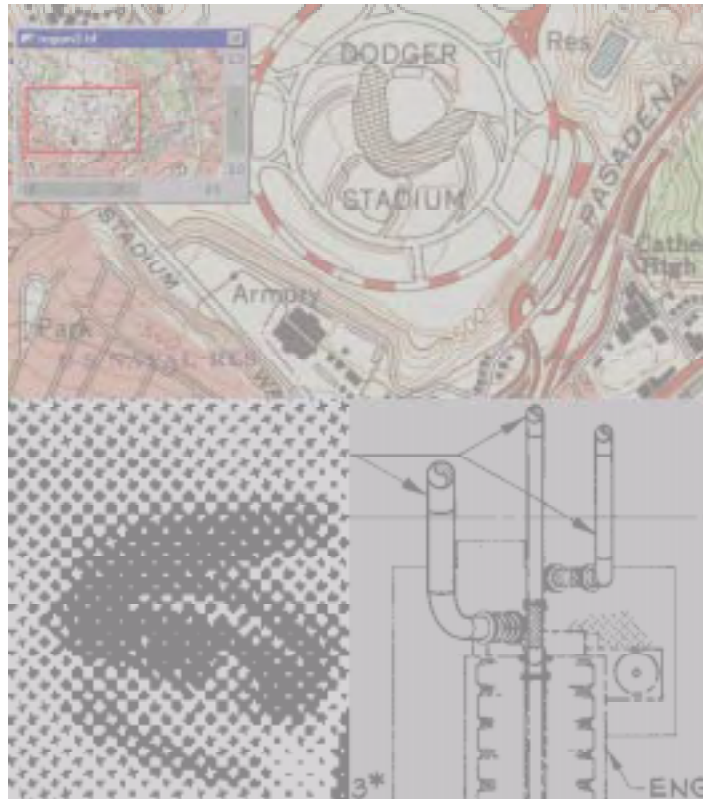
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INTRODUCTION



SCANSMITH PREDITOR

1. Introduction

This section provides information on the following topics.

- PREDITOR Features
- Installing PREDITOR
- Getting Help
- Raster Data
- Scanners

PREDITOR Features

SCANSMITH PREDITOR is an all-in-one display and edit program for working with raster data. PREDITOR works with black-and-white, grayscale, and 8 and 24 bit color data files. PREDITOR is specifically designed to handle very large raster files generated by the Eagle large format scanners. PREDITOR displays documents in many file formats. Here are some PREDITOR features:

- TWAIN scanning interface
- Overview window for easy navigation around large raster images
- Display black-and-white, grayscale, or color drawings
- Interactive thresholding to selectively threshold separate regions of a grayscale image into bi-level data
- Multiple files/multiple views, display more than one file, and/or more than one view of the same file; multiple file/drag-and-drop file opening
- Object oriented design makes PREDITOR fast, even when displaying large files
- Numerous editing functions are perfect for quick cleanup of scanned data
- Icon palettes to launch common operations
- Automated workflows for redlining of raster files
- Powerful grayscale and color imaging tools:
 - create halftone files from grayscale in a variety of halftone styles
 - adjust brightness, contrast, gamma, or perform equalize operations
 - “fuzzy” flooding and deleting operates on a color range
- Color file conversions among a variety of full color (24-bit) or color classified (8-bit) formats
- Black and white (bi-level) file format conversions -- load in one format and save in another
- Launches automatically from SCANSMITH SCAN after scanning a document
- Printing using Windows printer drivers for local or network printing
- Support for popular Windows and Internet raster formats (BMP, GIF, JPEG, TIFF, etc.)

Installing PREDITOR

1. To install PREDITOR, insert the PREDITOR CD. Locate the file setup.exe on the CD and double-click on setup.exe to start the installation.
2. The installation script is self explanatory. Follow the prompts to install the program.

Getting Help

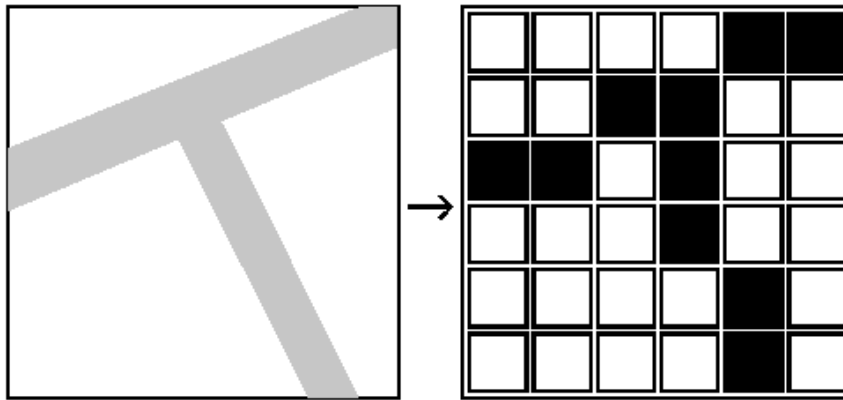
Online help is available within the PREDITOR program in the Help menu. Pull down Help and select Contents.

Descriptions of PREDITOR features are provided in pop-up help topics. Certain topics also have online tutorials.

This manual is also available in Adobe Acrobat format and is available in the Help menu by selecting Manual.

Raster Data

Raster data is a way of representing visual information in computer format. Raster data divides an image into tiny chunks called “pixels.” In monochrome (bi-level and line art) data, pixels are either foreground or background (black or white), usually represented by a 1 or a 0. In grayscale data, pixels can have values from 0-255, representing a shade of gray. Color raster data may consist of 16- or 256-color palette based data, or true color data that contains up to 16.8 million colors. Raster data is generated by document scanning devices such as ANA Tech Eagle scanners.



Raster data consists of rows and columns of pixels. Rows of pixels are called scanlines. This term is derived from the fact that Eagle scanners are line-based scanners that capture an entire line of raster pixels at once. As the document passes through the scanning device, sequential rows of pixels are captured.

After data capture, raster data can be reordered for display purposes by changing its scanline orientation. The scanline orientation is a code in the file header that tells the application, such as PREDITOR, how to orient displayed data.

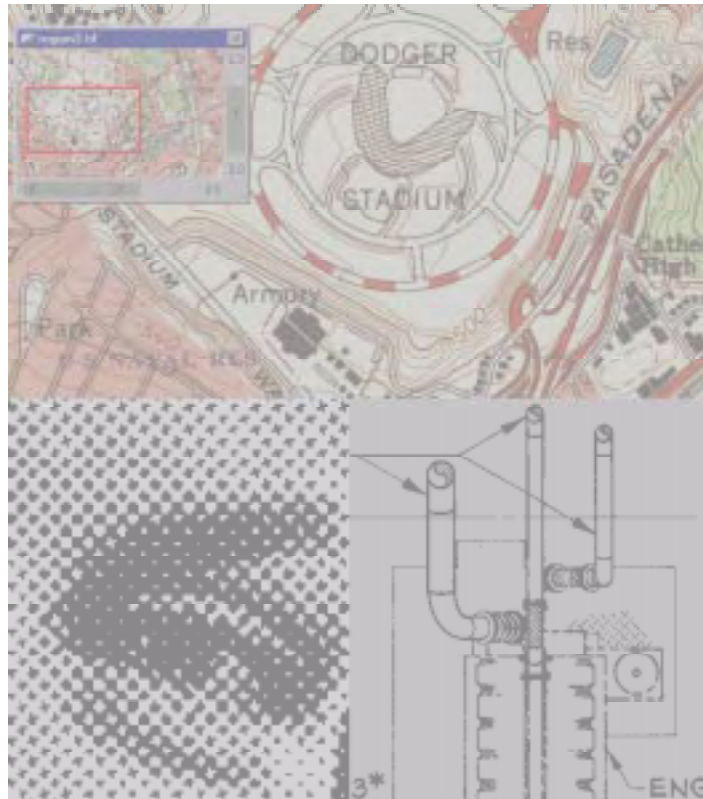
Scanners

Raster data is generated by document scanning devices such as ANA Tech Eagle scanners. Eagle scanners are large format scanners that scan large drawings such as maps, blueprints, plans, etc.

Evolution 4	1-400 dpi user upgradable tabletop scanner scans black and white or grayscale documents with an active scan width of 38 inches (96.5 cm); high speed up to 3 inches per second (7.6 cm / sec); includes APOGEE processor for real time Large Aperture Thresholding
Evolution 8	1-800 dpi tabletop scanner scans black and white or grayscale documents with an active scan width of 38 inches (96.5 cm); high speed up to 3 inches per second (7.6 cm / sec); includes APOGEE processor for real time Large Aperture Thresholding
Eagle 4080	1-1600 dpi console type scanner scans black and white or grayscale documents with an active scan width of 40 inches (101.6 cm); heavy duty scanner for production usage
Eagle 4240	1-800 dpi console type scanner scans black and white or grayscale documents with an active scan width of 42 inches (106.7 cm); heavy duty scanner for production usage
Eagle 6250	1-1000 dpi console type scanner scans black and white or grayscale documents with an active scan width of 62 inches (157.5 cm); heavy duty scanner for production usage
Eagle 3640C	1-400 dpi console type scanner scans color documents in full color or color classified modes with an active scan width of 36 inches (91.4 cm); heavy duty scanner for production usage
Eagle 4080C	1-800 dpi console type scanner scans color documents in full color or color classified modes with an active scan width of 40 inches (101.6 cm); heavy duty scanner for production usage

- Eagle 4240C 1-400 dpi console type scanner scans color documents in full color or color classified modes with an active scan width of 42 inches (106.7 cm); heavy duty scanner for production usage
- Eagle 6250C 1-500 dpi console type scanner scans color documents in full color or color classified modes with an active scan width of 62 inches (157.5 cm); heavy duty scanner for production usage

TUTORIAL



SCANSMITH PREDITOR

2. Tutorial

This section provides information on the following topics.

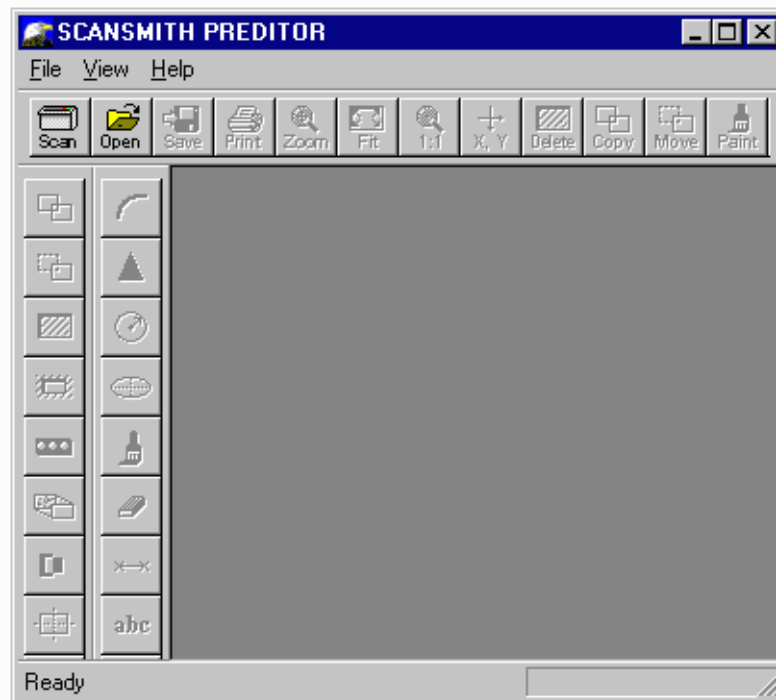
- Starting PREDITOR
- Loading a Black and White File
- Overview, Zoom and View Tools
- Loading a Grayscale File
- Loading a Color File
- Working with Color Files

Starting PREDITOR

1. Launch PREDITOR from the Start menu or by double clicking on the SCANSMITH PREDITOR icon.



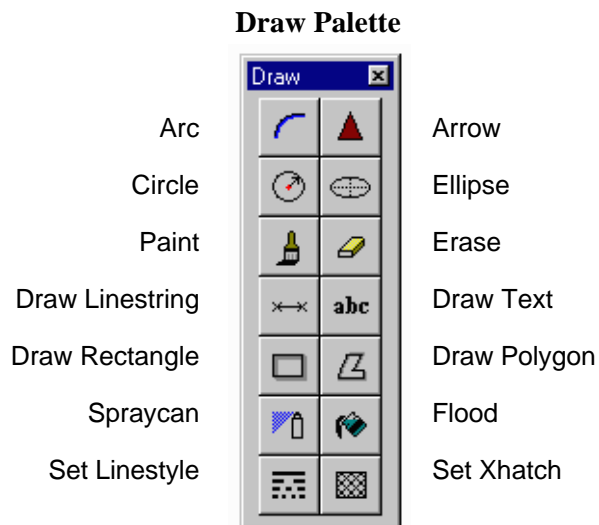
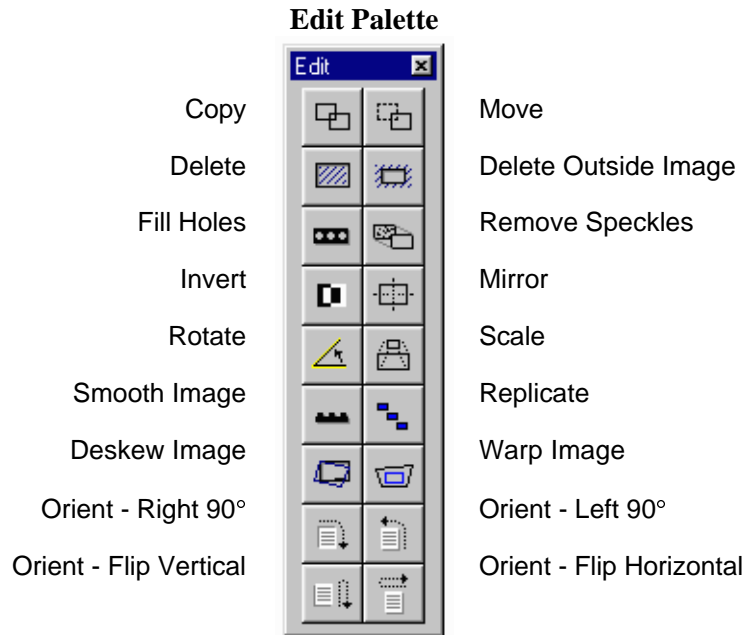
The start-up banner appears, then the PREDITOR main dialog appears. Note that if you click on the start-up banner it will disappear and the main dialog will come up immediately.



The *toolbar* that appears at the top of the dialog is used to launch common View operations, such as zooming and some editing operations.

The icon palettes provide quick access to commands in the Edit and Draw menus. Initially, the icon palettes appear on the left of the main dialog. You can drag the icon palettes to a convenient location.

Clicking the *left mouse button* on the icons in the icon palette executes the command. Clicking the *right mouse button* on the icons in the icon palette brings up the dialog for that command.



SCANSMITH PREDITOR Icon Palettes

The *status bar* at the bottom provides feedback from PREDITOR on current program status.

Most of the toolbar icons are grayed out at first. These will become active once you load a raster image into PREDITOR.

The Scan button in the toolbar acquires a TWAIN scanner image, if TWAIN is installed on the system.



The Open button is used to load files from disk.

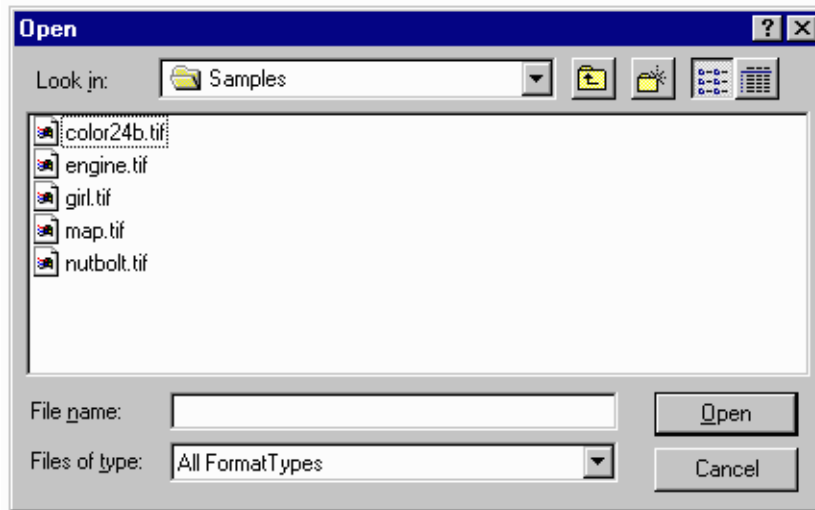


Loading a Black and White File

1. Click on the Open icon, or select File–Open in the pulldown menus.
2. The Open dialog appears. Select the black and white (bi-level) sample file, **engine.tif**. Click OK when ready.

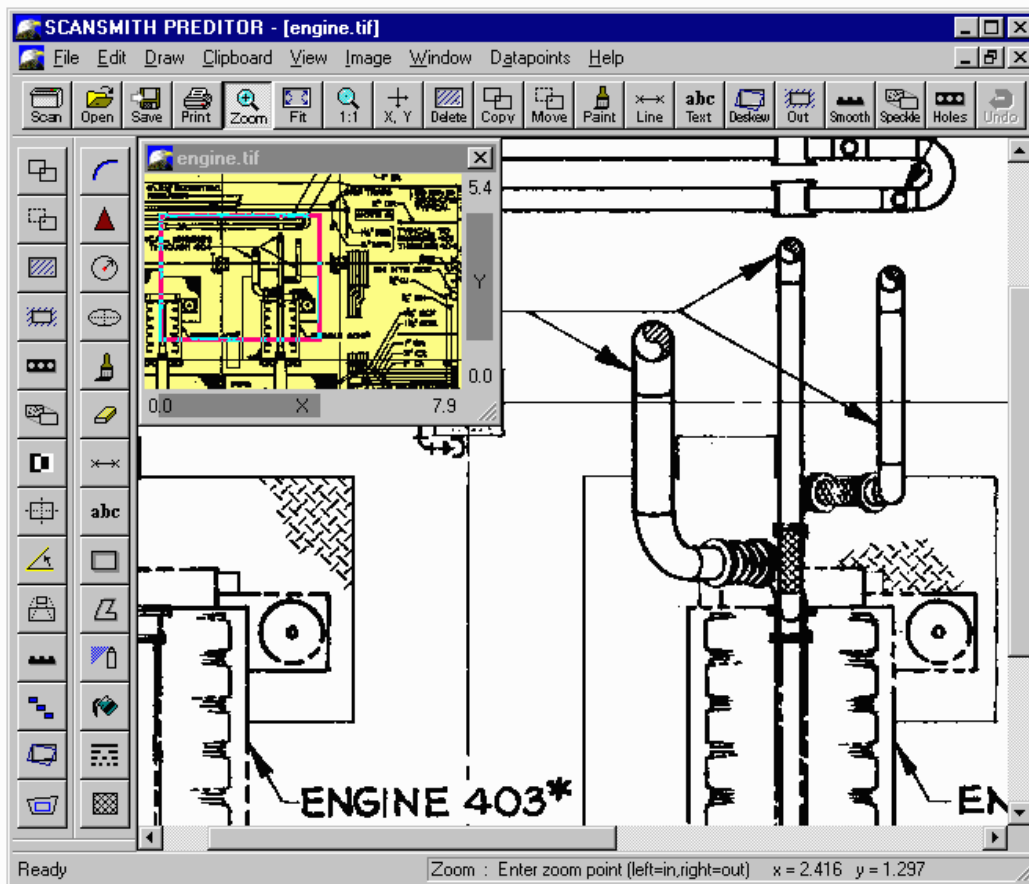
The sample files are saved in the ..\samples directory during PREDITOR installation.

This tutorial will frequently refer to these sample files, so it is important that you locate the files on your disk now.



3. PREDITOR then displays the sample file. The toolbar changes to show tool icons available for black and white files.
4. Try editing the image. Click on the paint icon. When the Paint dialog appears, just click OK for now — we will cover the details of using features later. Then position the cursor somewhere in the image and depress the left mouse button and move the mouse while depressing the button. New foreground pixels are displayed in the image window.





Displaying a black and white image in PREDITOR

5. Pull down the Edit menu. All of the functions listed in this menu are for use with black and white files. These functions are reviewed in detail later in this manual.
6. Pull down the Draw menu. All of the functions listed in this menu are also for use with black and white files.
7. Now pull down the File menu and select Preferences–Undo. The Undo Preferences dialog is used to set undo preferences for these editing and drawing operations. Also select Preferences–Bi-level Files. The Bi-level Files Preferences dialog selects the status of gridlines for black and white files.

Note You can open multiple files at once by dragging the file icons in Windows Explorer over the PREDITOR icon.

Black and White Data

Black and white data is also referred to as monochrome, line art, or bi-level data. In black and white data, a 0 or 1 represents each raster pixel. Black and white file formats include variations of TIFF, PCX, CALS, BMP, and others. Many black and white file formats employ data compression with black and white raster data.

Typically, data compression involves encoding bi-level data into sequences of run lengths. A run length is a continuous sequence of all-white or all-black pixels. Since much raster data consists of long series of all-black or all-white pixels, excellent data compression is often possible. However, if the data consists of many short run lengths, data compression is less efficient.

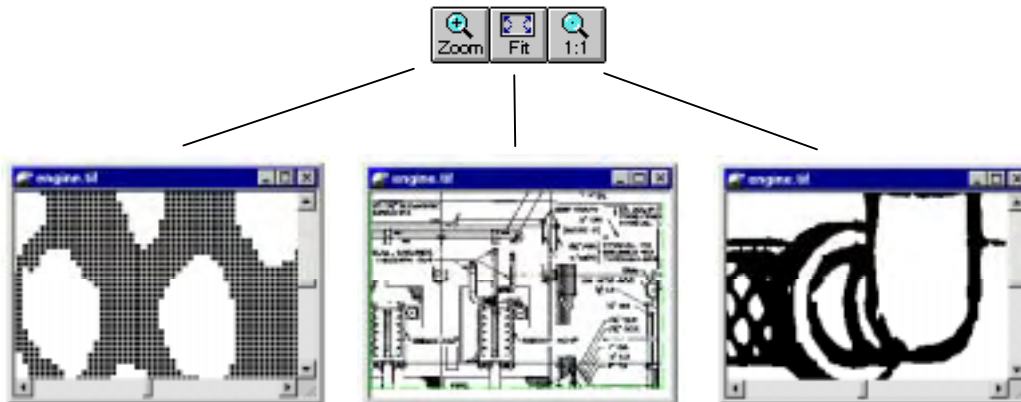
Much black and white scanned data consists of maps and drawings of the sort used with CAD systems. PREDITOR provides a wide set of tools to work with this type of data. Black and white data is also called foreground and background data. Typically, foreground refers to the black pixels that represent lines and shapes, while background refers to the white pixels that represent surrounding whitespace. Editing and drawing functions for black and white files involve adding or removing foreground pixels. For editing operations, the operation can be performed on a selected region, or in many cases the entire image, or a raster item, which is a single group of foreground pixels.

Here's a tip for working with images that have white rather than black foreground data, such as data scanned from a film of a circuit design, where lines are white and the background is black: *Use the Edit-Invert feature to reverse black and white. After making your edits, again invert the image before saving it.*

Overview, Zoom and View Tools

The Overview, Zoom and View Tools work with all types of files that PREDITOR displays. Follow the steps in this section to become familiar with these tools. You may continue to use the black and white image that was loaded in the previous section to experiment with the Zoom and View functions.

1. Click on the Zoom icon, then click on the image. Click the left mouse button and observe zooming in. Click the right mouse button and observe zooming out.
2. The PREDITOR zoom tools let you zoom in or out on an image, or display an image with a 1:1 ratio of data pixels to screen pixels, or fit an image within the current window.
3. Note how the red rectangle changes size in the overview window when you zoom in on the image. You can quickly change the image display area by moving the red rectangle in the overview window.



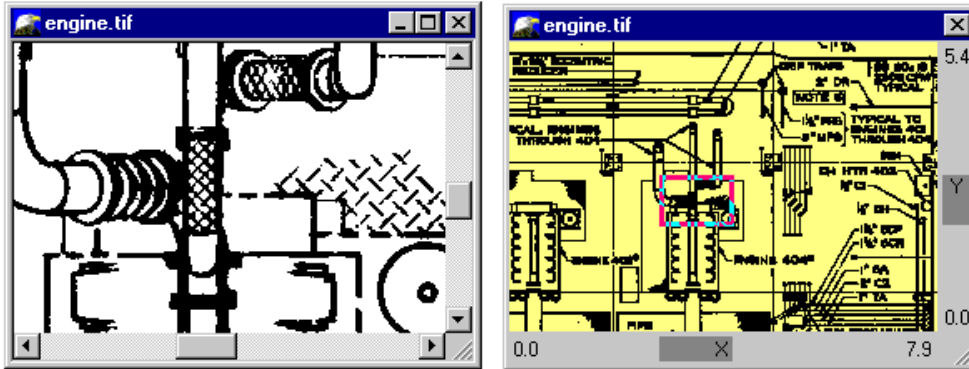
To use the Zoom function, select the Zoom tool, position the cursor over the image, then left-click or right-click. Left-click zooms in. Right-click zooms out.



To use the Fit function, select the Fit tool, position the cursor over the image, and left-click.



To use the 1:1 function, select the 1:1 tool, position the cursor over the image, and left-click.



On the left is the image and on the right is overview window. The Rectangle in the overview box shows the area of detail in the current image window.

The Overview window provides an interactive thumbnail view of the data. The rectangle in the Overview window shows the portion of the image which is currently displayed in the data window. You can interactively drag the overview rectangle to change the image display. Additionally, the following mouse-keyboard shortcuts are available:

Shortcut	Action
Left-click mouse + CONTROL key	Zoom in.
Right-click mouse + CONTROL key	Zoom out.
Left-click mouse + SHIFT key	Zoom to 1:1.

Note You can suspend Edit and Draw functions with Image tools such as zooming. You can then resume Edit and Draw actions in progress by pressing the Escape (ESC) key. See the Image Menu chapter for details.

Loading a Grayscale File

1. Click on the Open icon, or select File–Open in the pulldown menus.
2. The Open dialog appears. Select the file, **gray.tif**. Click OK when ready.
3. A grayscale image displays and the toolbar changes.
4. Pull down the File menu. Note the Halftone feature. This is unique to grayscale files. The Halftone feature lets you generate black and white halftone files from grayscale images.
5. Pull down the Image menu. Note the Adjust feature. This is also unique to grayscale files. The Adjust feature lets you modify the brightness and contrast settings of the displayed image, perform Equalize operations, and save grayscale lookup tables (LUTs) for use with SCAN when scanning in grayscale mode.

These features will be reviewed in more detail later.

6. Select File–Close to close the image display.

Note You can open multiple files at once by dragging the file icons in Windows Explorer over the PREDITOR icon.

Loading a Color File

1. Click on the Open icon, or select File–Open in the pulldown menus.
2. The Open dialog appears. Select the color sample file, **map.tif**. Click OK when ready.
3. A color image displays and the toolbar changes.
4. Pull down the File menu and select Save As. Note that the Save As dialog for color files lets you save 8-bit color data as a series of separate raster layers.

Note You can open multiple files at once by dragging the file icons in Windows Explorer over the PREDITOR icon.

Working with Color Files

SCANSMITH PREDITOR provides a variety of tools that are useful when working with color data. Many of the Edit and Draw functions are available for color files.

Also, because you can specify which colors to use as foreground and background colors, SCANSMITH PREDITOR lets you choose how to apply raster operations. This lets you devise a variety of raster editing techniques for working with color features in your data.

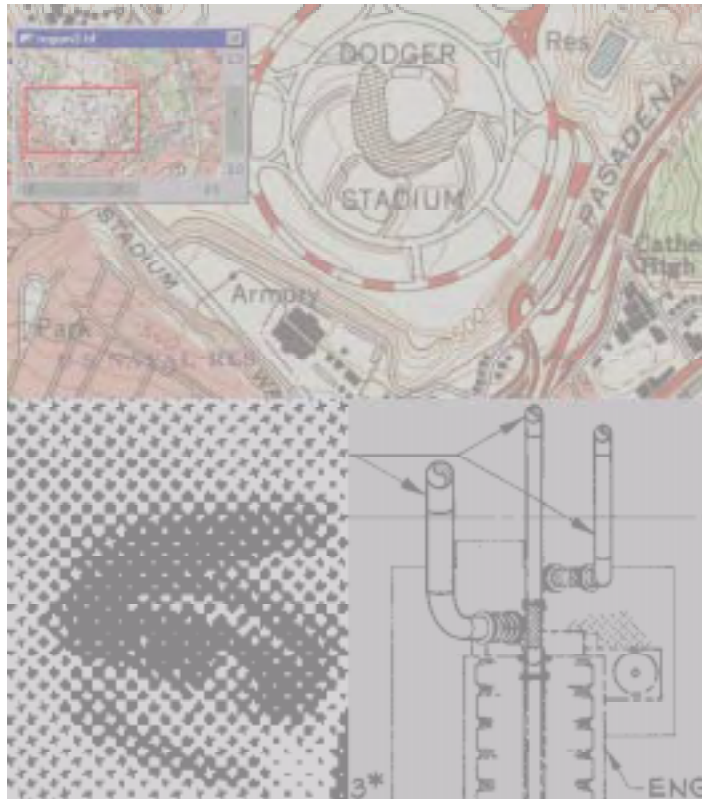
Example 1:

Suppose you want to isolate and delete certain colors from a color classified image (8-bit color). These colors may represent a map feature you do not want to keep, or some other unwanted data. Use the Image-Colors function to specify the color of the data you want to delete as the foreground color. Then use Edit-Delete to delete the foreground color.

Example 2:

If you want to remove unwanted clutter around an important feature in a color classified image, use the Image-Colors function to specify the color of the data you want to keep as the foreground color. Then use Edit-Delete to delete all non-foreground pixels. Everything is removed except the specified foreground color. Remaining pixels are changed to the background color.

FILE MENU



SCANSMITH PREDITOR

3. File Menu

This section provides information about the PREDITOR File menu.



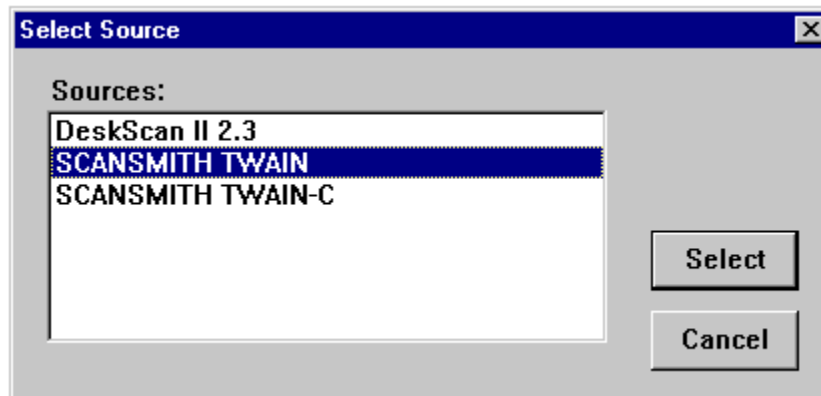
File New Scan



The New Scan command acquires a raster image from a scanner with a TWAIN scanner interface. TWAIN is a scanner interface standard supported by most scanner manufacturers, including ANA Tech Eagle scanners with the SCANSMITH TWAIN option. To use File-New Scan to capture a raster image, the TWAIN software for the scanner you want to use must be installed on your system. Installation of the TWAIN software is separate from installation of SCANSMITH PREDITOR.

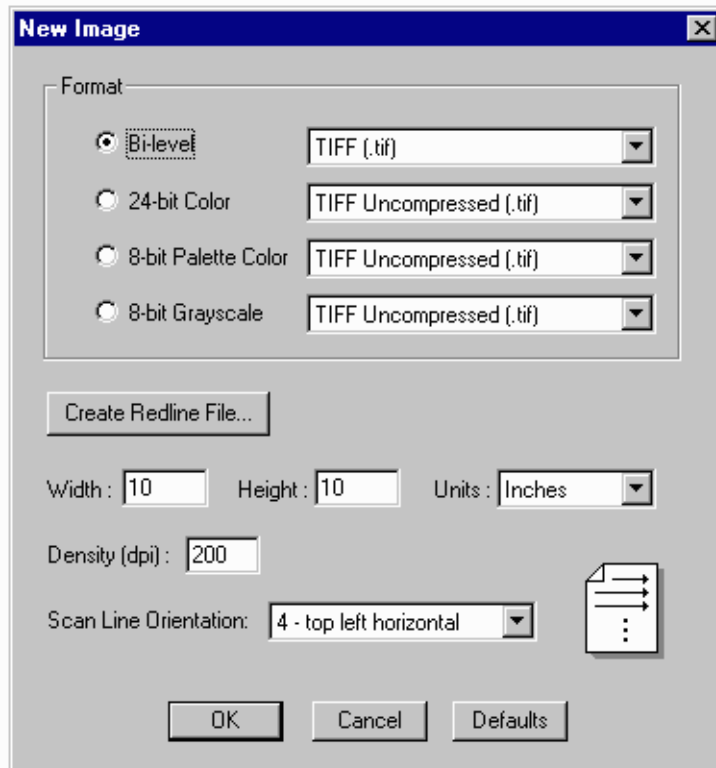


1. To use File–New Scan, click on Select Source to bring up the Select Source dialog.



2. A list of scanners with TWAIN interfaces installed are displayed. Select the scanner you wish to use and press Select. This completes the source selection.
3. To perform a scan, click on Acquire. This starts the TWAIN interface for the selected scanner. Note that the TWAIN software is installed separately from SCANSMITH PREDITOR.
4. Use the TWAIN interface software to operate the scanner and start the scanner. Refer to applicable documentation for your TWAIN scanner interface.

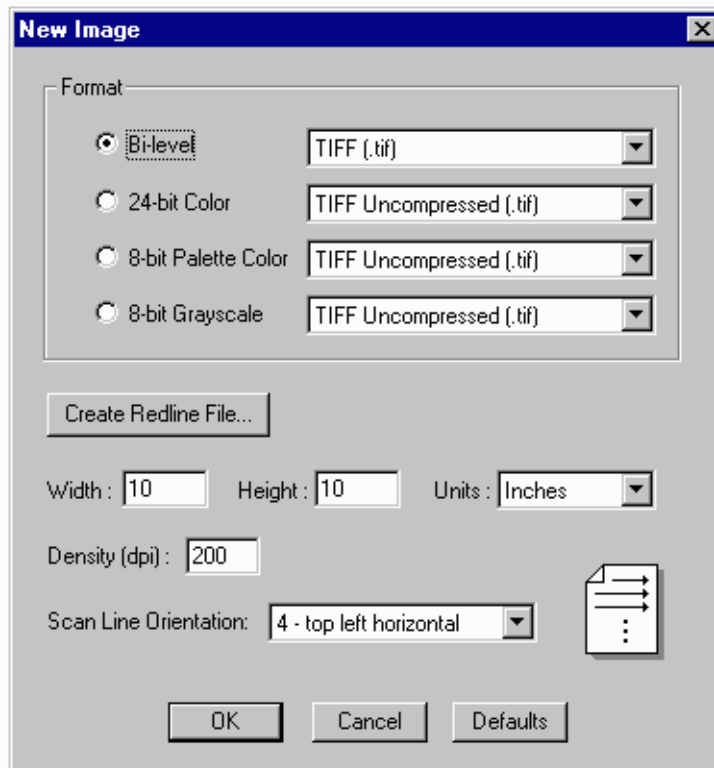
5. After the TWAIN interface has scanned a document, SCANSMITH PREDITOR displays the following dialog:



6. Select the format in which you want to save the scanned data. Also select the units (inches, centimeters, or pixels) and the scanline orientation. When ready, press OK. The scanned data is then displayed by SCANSMITH PREDITOR. After viewing and editing the image, use File-Save As to save the image to a disk file.

File New

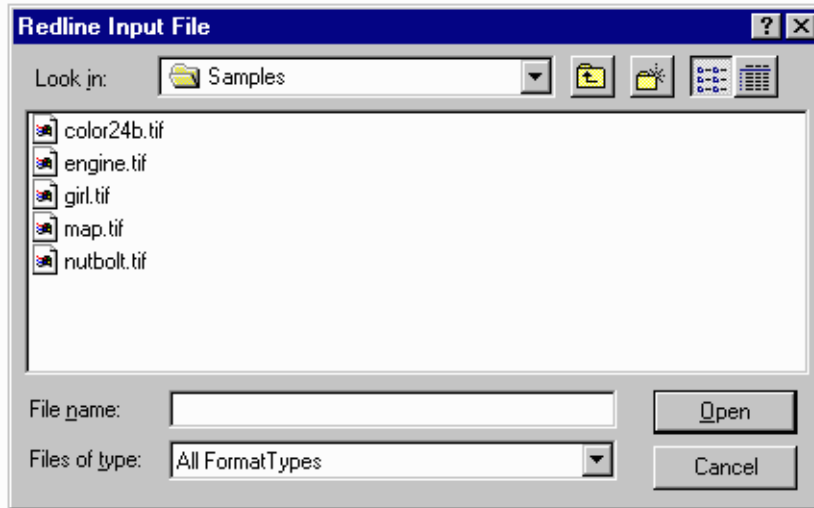
File-New creates a new raster image. You can create bi-level, grayscale, 8-bit palette color, or 24-bit color files.



1. To use File–New, select the type and format for the new file. Enter width, height, units, density, and scan line orientation. (Note that you can select orientation by clicking on the orientation icon to the right of the Scan Line Orientation menu.)
2. If you want to make a special redline file, press Create Redline File (see below).
3. When you press OK, a blank image appears in PREDITOR. Note that you subsequently must use the File–Save As feature to save the image to a disk file if you want to keep the file.

Creating Redline Files

Redlines are similar to paper redlines. Redlines let you use color to make annotations and notes to a bi-level or grayscale image. When you create a redline image, an 8-bit color image is created and the bi-level or grayscale data is loaded into the new color image.



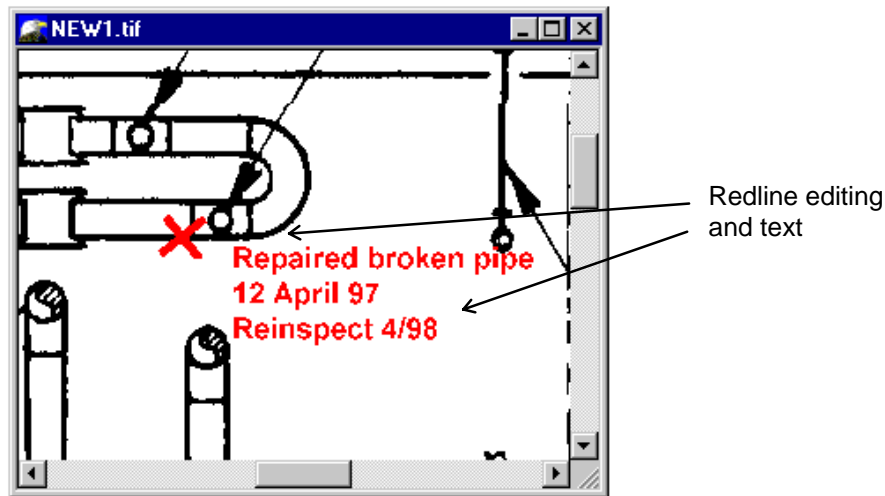
1. To create a redline file, press *Create Redline File* in the New Image dialog. The Redline Input File dialog comes up.
2. Select a redline input file. This is the file that contains the data you want to redline. This must be a bi-level or grayscale file. Press OK.
3. The input file is loaded and displayed in redline form.
4. The color picker tool appears automatically (see Image-Colors) with the foreground color set to red.



5. Make edits and annotations as needed.
6. When ready, use File-Save As to save the image to a disk file. Note that you can save the redline work as a separate bi-level file, or you can save the entire image with redlines as an 8-bit color file.

Redline images for bi-level files assign white to color index 0, black to color index 1, and a variety of colors to the other indexes. Redline images for grayscale files assign white to color index 0, black to color index 1 and assign

a variety of colors to indexes 2-15, reserving all remaining color indexes for the grayscale data itself.



Redlining Tips

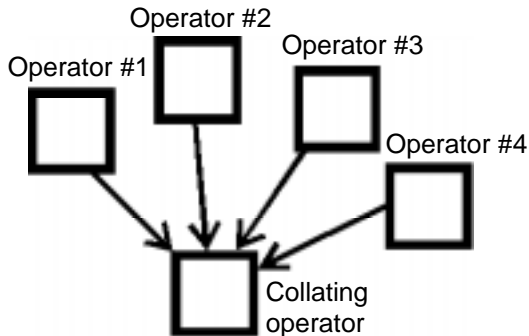
Saving redlines without saving the input image. You can save just the redline color if you wish. This may be useful if you want to save disk space and you do not want to duplicate the entire original drawing to save some redline changes. To save only the redline work, use the Save As Separate Bi-Level Raster Files dialog (see File-Save As). In the boxes for *Start/Stop Color Index Numbers To Be Saved*, enter 2 (the red color, which is the default foreground color for redline files, has a color index of 2.)

Reattaching redline work to the original image. You can precisely reattach redline work to your image with the File-Merge feature and Datapoints-Mouse Keyins:

1. To reattach redline work that has been previously saved as a separate file, use File-New to create a new redline image. Select the original file as the input file.
2. The original images appears, without any redline data.
3. Select File-Merge. In the Merge dialog, select the file that contains the redline work. Press OK.
4. In the next Merge dialog, set the *Background* option to *Transparent* and turn off *Enable Undo*.

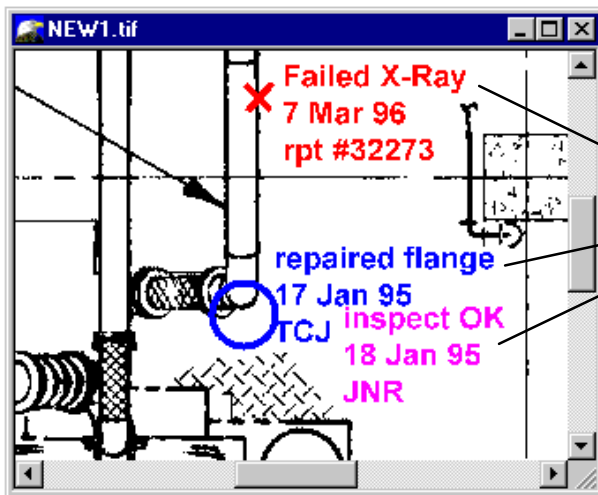
- When the rectangle appears for placement of the merge file, pull down the Datapoints menu and select Mouse Keyins. Enter 0, 0 for X, Y coordinates. Then press *Left Button* in the Mouse Keyins dialog. The redline data then appears exactly in its original position.

Working with multiple redline files. You can create multiple redline files if needed. When reattaching these files as described above, use the Color Picker tool to change the foreground color before merging additional redline files. With this technique, each redline file will appear in a different color, so you can see the different redline changes.



Example:

Several operators may contribute modifications to an industrial drawing. One operator may be responsible to collate all these changes. Using the technique described above for working with multiple redline files, the collating operator would load the original image as a redline and merge into this file the various redlines from the other operators, using different colors.

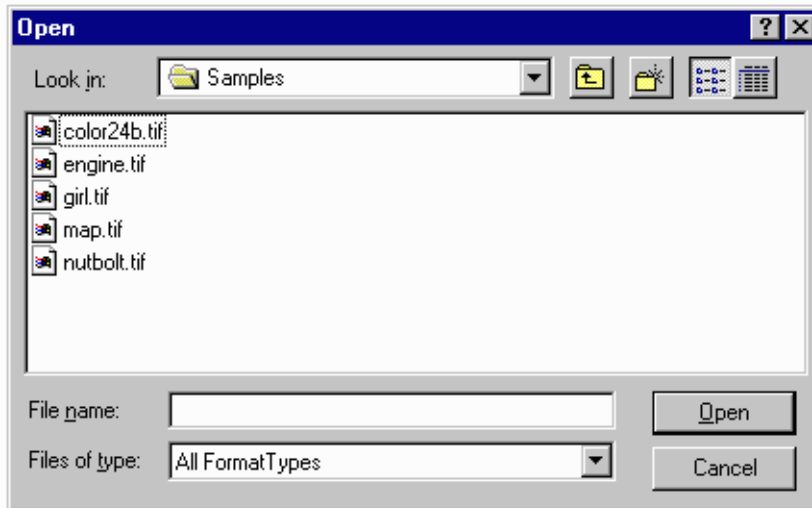


Redline image using three colors for different redline edits.

File Open



File-Open is used to open a raster file for viewing, using a standard Windows open file dialog. PREDITOR supports the formats listed below.



Black and White

TIFF: Group 4 Fax,
Group 3 Fax,
Group 3B,
Packbits,
Group 3 2D, and
Uncompressed

BMP

CALS Type 1

Image Systems RLC

Intergraph RLE, CIT,
and TG4

PCX

Hitachi HRF

Indigo RST1 and RST2

ANA Tech LRD, G4
and G3

GTX G4 Levels 2 and 3

Grayscale

TIFF uncompressed
Intergraph COT,
T29
JPEG (JFIF)

Color

TIFF: 24 bit RGB
palette (8 bit)
palette (8 bit packbits)
palette (4 bit)
BMP (4, 8, and 24 bit color)
GIF (87a and 89a,
interlaced/non-interlaced,
optional transparent
background)
Intergraph RGB, T27, COT,
CRL, and T29
PCX
JPEG (JFIF)

Note PREDITOR supports TIFF stripped and unstripped data formats.

File Close

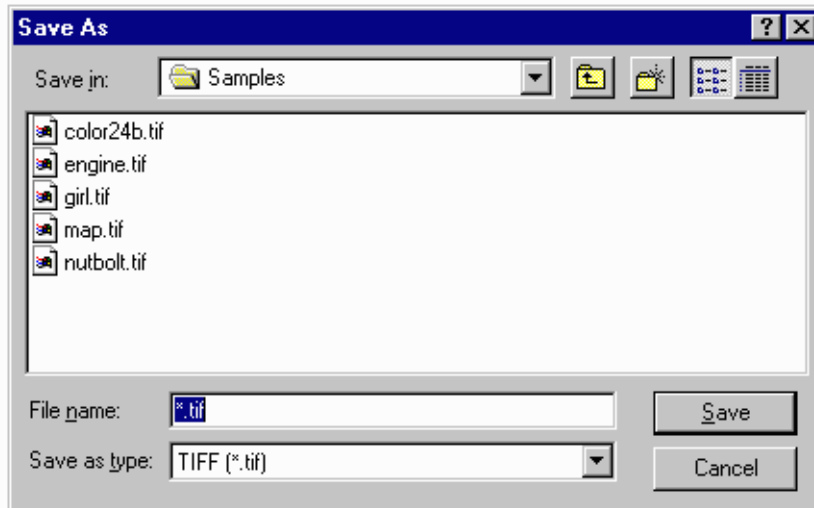
The Close command closes the active file. All view windows of the file are closed.

File Save

The Save command saves the current image, overwriting the original file. Note that if you have made any edits and you use File-Save, the original file will be modified. Use File-Save As if you have made edits and wish to save the file under a different filename than the original file.

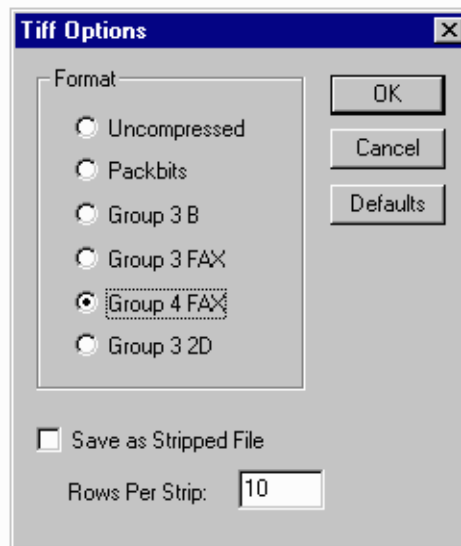
File Save As

The Save As command saves the file under a specified filename, in the specified file format. For bi-level files, you can save raster files in formats other than the original format. Color and grayscale files are saved in the original format.



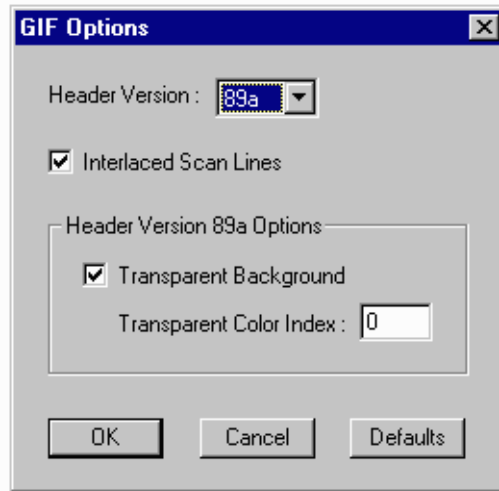
TIFF Options

If you select a TIFF format, the Tiff Options dialog appears. For color or grayscale files, the Tiff Options dialog lets you select TIFF strip settings. For bi-level files, the Tiff Options dialog lets you select the TIFF file type as well as TIFF strip settings.



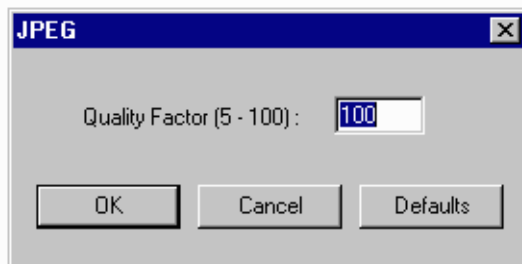
GIF Options

If you select a GIF format, the Gif Options dialog appears. Header Version selects GIF 89a or 87a. Interlaced Scan Lines selects whether the GIF file will use interlaced scan lines such as are used when displaying images in Web browsers. Transparent Background enables a transparent color which is specified in the Transparent Color Index field.



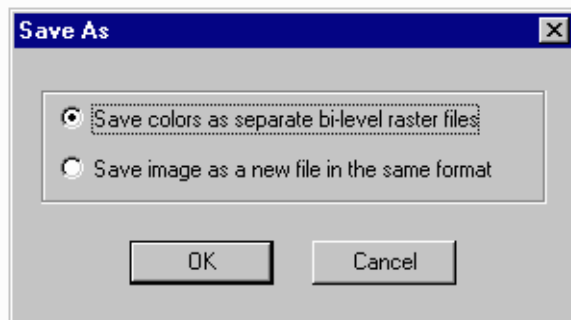
JPEG Quality Factor

If the output format you select is JPEG, an additional dialog appears prompting you for a JPEG quality factor between 5-100. JPEG is a lossy format that allows some loss of the original information in an image in order to achieve better data compression. Higher numbers are less lossy, in that output file size is larger and more of the original data is preserved. Lower numbers result in smaller output file sizes, with lower data quality. JPEG data compression uses a discrete cosine transform (DCT) algorithm to perform data compression. This algorithm is implemented for all quality factors, so even at a quality factor of 100, the JPEG conversion is lossy.



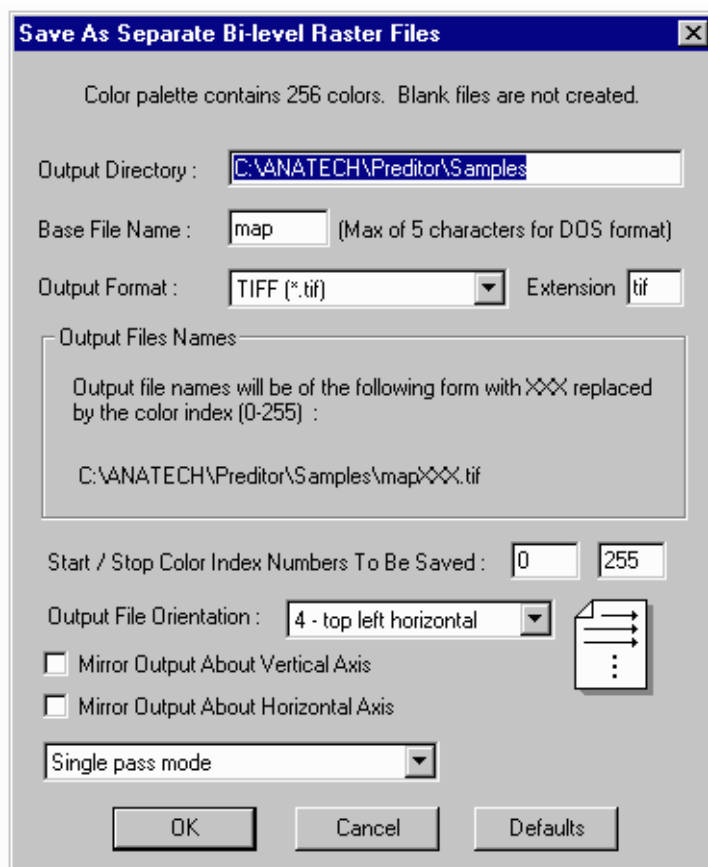
Saving Color Classified Files

If you are saving a color classified file (8-bit color), you can save the file as another color classified file of the same format, or as a series of black and white bi-level files. This is useful if you want to separate colors in a map or other color document in order to edit individual features.



- If you want to save the image as separate bi-levels files select *Save colors as separate bi-level raster files*.

- If you want to save the image as a single color file select *Save image as a new file in the same format*.



Save As Options for Color Classified Files

Output Directory	Select the destination directory for the output files.
Base File Name	Select a filename. The individual files that are saved use this base filename, with the color index number appended to this filename.
Output Format	Select any bi-level format which PREDITOR can save.
Start / Stop Color Index Numbers to be Saved	Select a range of colors to save as separate output files. To save only one color, enter that color's index value for both start and stop.
Output File Orientation	Select a scanline orientation for file header. (Note that you can select orientation by clicking on the orientation icon to the right of the Output File Orientation menu with the right or left mouse button.)
Mirror Vertical	Mirrors data about vertical axis.
Mirror Horizontal	Mirrors data about horizontal axis.
Single pass mode	Simultaneously opens all output files; extracts output data from the color file in a single pass.
Multiple pass mode	Sequentially opens one output file at a time, making multiple passes through the color file.
Multiple pass with temporary storage	Makes a single pass through the color file, temporarily stores data, then sequentially saves output files.

Eagle color scanners output color classified (8-bit) files or full color 24-bit color files. To generate color classified files, you use **SCANSMITH CLASS** to create a color lookup table. Then you specify the color lookup table in the scanning software and select a color classified output file format. Refer to ANA Tech color scanner documentation and **SCANSMITH CLASS** documentation for details.

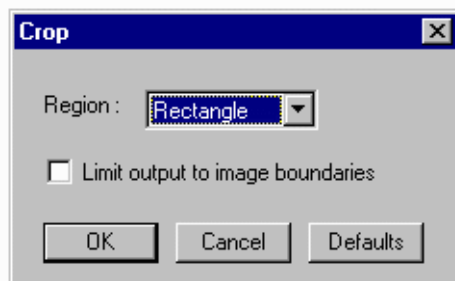
If you select a TIFF format, the Tiff Options dialog appears (see Save As).

File Crop

The Crop command extracts and saves a selected image area.

1. To perform a crop operation, select Crop from the File menu. When cropping bi-level formats, you can choose either a rectangular or polygonal area selection. If you select *Limit output to image boundaries*, regions in the selected crop area that are outside of the image boundaries are automatically omitted from the crop output.

For color and grayscale cropping, the crop area is always rectangular and this dialog is skipped.



2. Select the image area using the mouse. If selecting a polygon, a right mouse click completes the polygon. Next, select the output filename and file type.

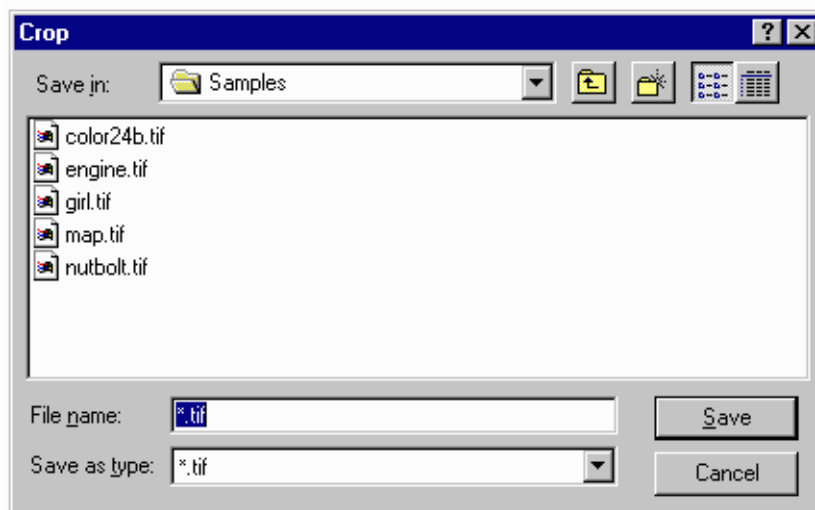


This is the cursor that appears when you are selecting a rectangular area for cropping.



This is the cursor that appears when you are selecting a polygonal area for cropping.

3. After you select the area for cropping, another dialog appears that prompts for an output filename. If you select a TIFF format, the Tiff Options dialog appears (see Save As).

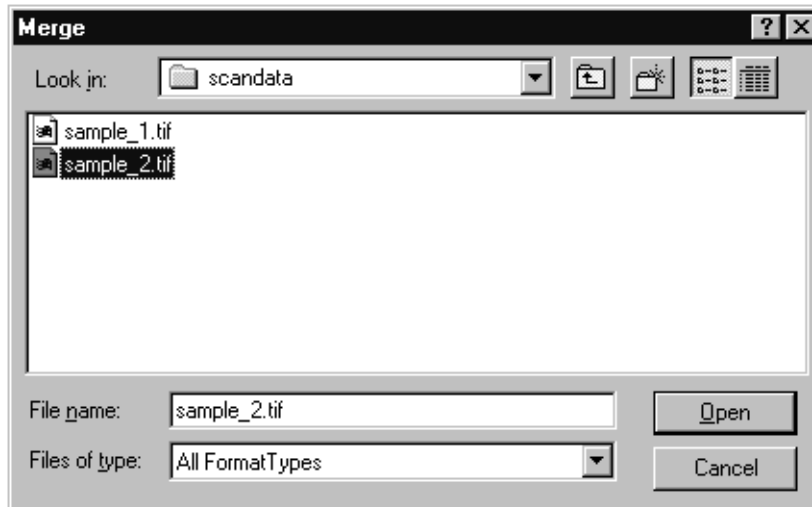


4. Select the output filename. The crop area is saved in the filename you select.

When cropping bi-level images, you can specify a crop output file format different than the source file format. When cropping grayscale and color files, the crop output format is the same as the source file format.

File Merge

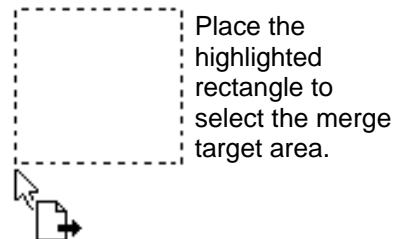
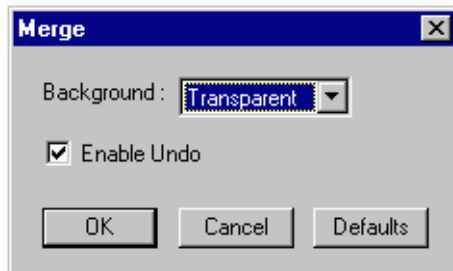
The Merge command merges a selected file from disk to the displayed image data. Select the file to merge.



After the file to be merged is selected, the second Merge dialog appears.

Background options (transparent or opaque) determine whether merged data replaces the original data in the target area or is combined with that data.

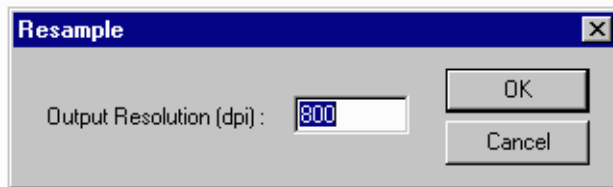
Enable undo allows undo's of merge operations.



1. To use Merge, select the filename of the file you want to merge into the displayed file.
2. The cursor changes to show you the merge rectangle. Place the rectangle to select the target area.
3. The file is merged to the target area.

File Resample

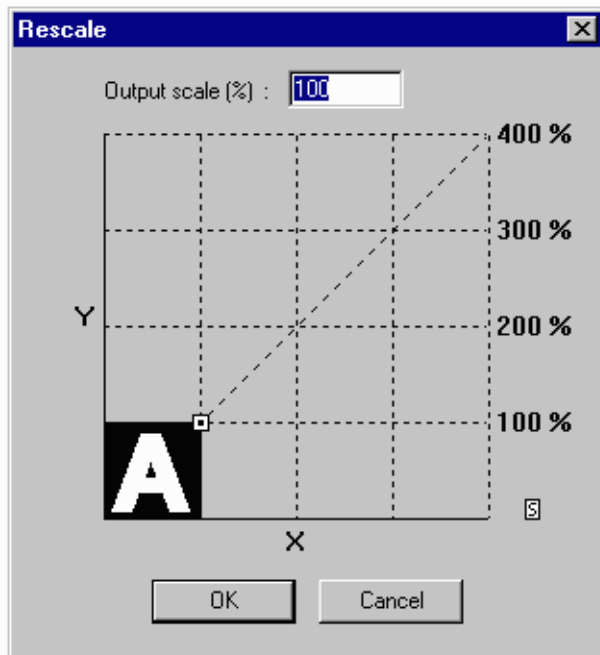
The Resample command saves the current image as a new file with a different dpi resolution. For bi-level files, you can save resampled raster files in formats other than the original format. Color and grayscale files are saved in the original format. Resampling to a higher resolution adds pixels, while resampling to a lower resolution removes pixels. Note that, for bi-level (line art) files, if you double the resolution *exactly* (e.g., 200 dpi to 400 dpi), intelligent pixel processing algorithms are used to smooth diagonal edges, avoiding the jagged appearance that sometimes results along line edges when resampling to higher resolutions. This feature may be useful when preparing files for plotting.



1. To use Resample, select the output resolution, then press OK.
2. When prompted, enter the output filename. If you select a TIFF format, the Tiff Options dialog appears (see Save As).

File Rescale

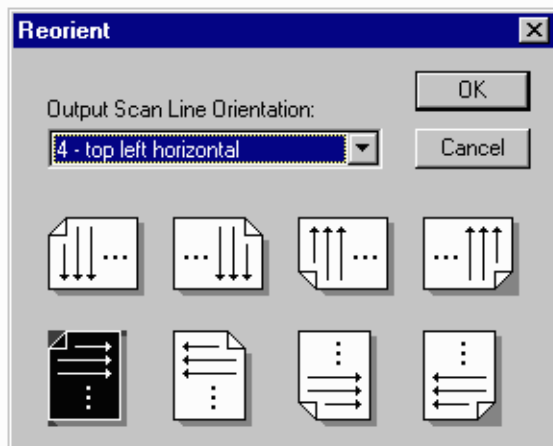
The Rescale command saves the current image as a new file with a different size. For bi-level files, you can save rescaled raster files in formats other than the original format. Color and grayscale files are saved in the original format. Enter a percentage value to shrink or expand the image. Rescaling affects the raster data itself -- new pixels are created to make the image larger, and pixels are removed to make the image smaller. Rescaling does not affect the dpi resolution which is specified in the raster file header.



1. To use Rescale, select the output scale. You can use the interactive scale tool or manually key in the new scale factor. The Snap Percent dialog (called by pressing “S” in the Rescale dialog) sets increments for the interactive scale tool. Press OK when ready. Note that you can scale at factors greater than 400% by manually keying in the scale factor.
2. When prompted, enter the output filename. If you select a TIFF format, the Tiff Options dialog appears (see Save As).

File Reorient

The Reorient command saves the current image as a new file with a different data orientation. For bi-level files, you can save reoriented raster files in formats other than the original format. Color and grayscale files are saved in the original format. The image pixels are reordered and the file is saved with the specified scanline orientation in the header. Use the Reorient command when you need to change the raster data itself, *not* just the scanline orientation value in the file header. Typically Reorient is used to prepare a raster file for use with some external software or device (such as a plotter) that requires a different data orientation to use the file.

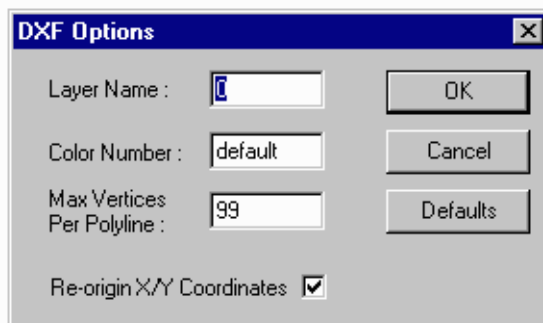
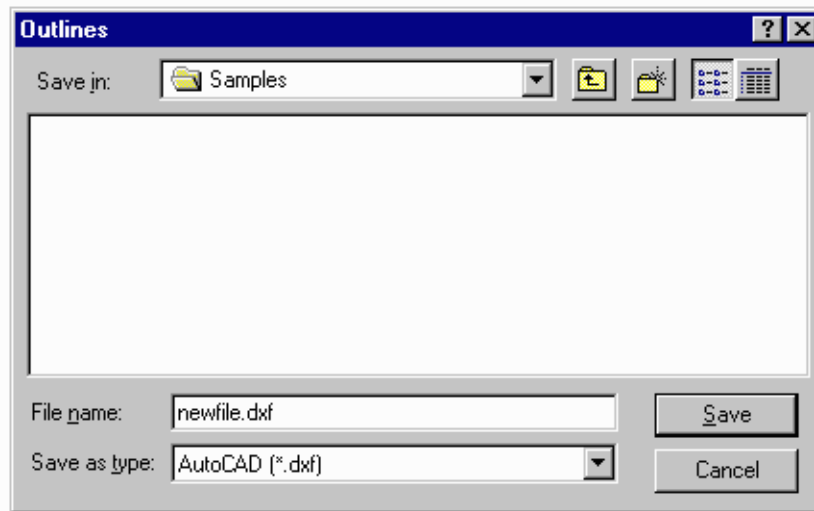
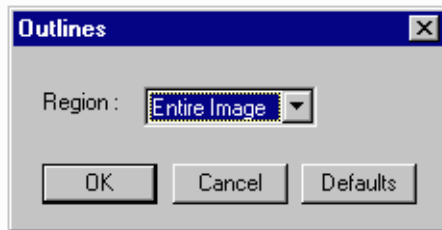


1. To use Reorient, select the output orientation, then press OK. You can use the Output Scan Line Orientation menu to select the new data orientation or click one of the orientation icons.
2. When prompted, enter the output filename. If you select a TIFF format, the Tiff Options dialog appears (see Save As).

Note that Reorient is NOT used just to change the display orientation in PREDITOR — see Edit-Orientatoin instead.

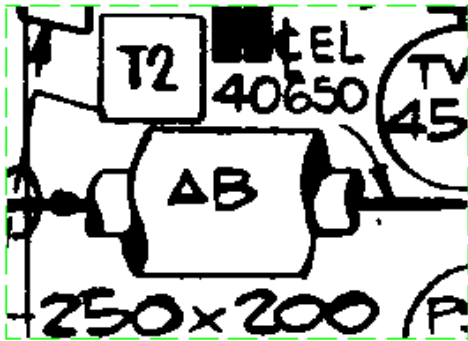
File Outlines

The Outlines command (available for bi-level files only) lets you convert line art image data into a DXF vector file which is saved to disk. First, select the Region, either Rectangle, Polygon, or Entire Image. If Rectangle or Polygon is selected, you then use the mouse to select the region. A dialog appears requesting the vector out file name. A third dialog lets you set up DXF options that determine how the raster data is converted into vector data.

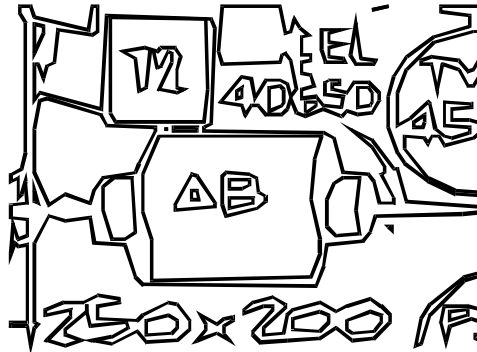


What Does the Outlines Feature Do?

The Outlines feature analyzes the selected region of raster data. It looks at the edges of all raster data to determine where to place vectors. When viewed in a vector application such as AutoCAD, the vector data will appear as an outline of the corresponding raster data.



raster data



vector data

DXF Options

Layer Name	This number specifies the AutoCAD layer name for the output DXF file.
Color Number	This species the AutoCAD color for the output DXF file. The default setting uses the current AutoCAD color.
Maximum Vertices Per Polyline	This number specifies how many vertices each vector polyline may have. On complex raster drawings that require many lines, after the maximum vertices number is reached, PREDITOR starts a new vector polyline.
Re-origin X/Y Coordinates	When this selection is ON, the lower left corner of the converted area is re-positioned to grid coordinates 0,0 of the output file.

How to Use Outlines

To create an outline (vector) file, follow these steps:

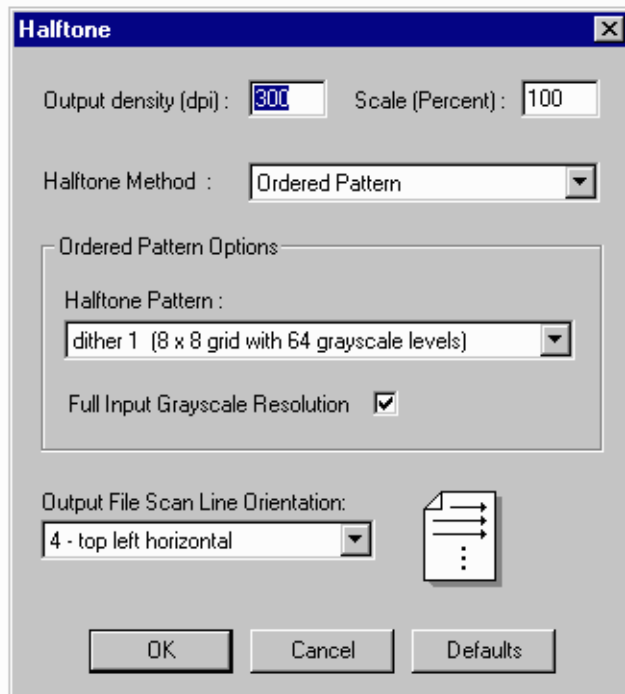
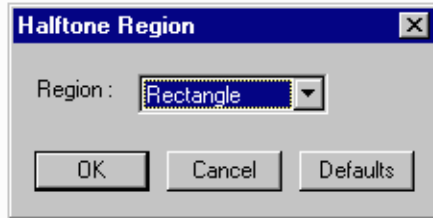
1. Load and display a line art file in PREDITOR.
2. Select File-Outlines.
3. In the Outlines dialog, select Rectangle, Polygon, or Entire Image to specify region for conversion, then click on OK.

If Rectangle or Polygon is selected, use the mouse to select a rectangular or polygonal region (see Draw-Rectangle or Draw-Polygon).

4. The Outlines dialog appears. Select a filename for the output DXF file.
5. The DXF Options dialog appears. Specify DXF output settings as needed. See DXF Options, above. When you select OK, PREDITOR creates the output file.

File Halftone

The Halftone selection lets you convert grayscale image data into a halftone file which is saved to disk. Halftone data is binary (black-and-white, line art, bi-level) data.



How to Use Halftone

To create a halftone file, follow these steps:

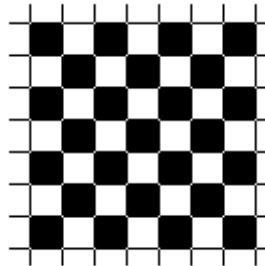
1. Load and display a grayscale file in PREDITOR.
2. Select File-Halftone. In the dialog that appears, select Rectangle or Entire image.
3. If you selected Rectangle, place a rectangle in the image to select the area for conversion to halftone.

4. The Halftone dialog appears. Select halftone file output parameters as needed. Select the output density, scale, and halftone pattern options. Also select the scanline orientation for the output file. You can use the Output File Scan Line Orientation menu to select the orientation or click on the orientation icon until the correct orientation appears. Press OK.
5. When prompted, enter the output filename. If you select a TIFF format, the Tiff Options dialog appears (see Save As).
6. PREDITOR then saves the halftone data to disk in the selected filename.

What is Halftoning?

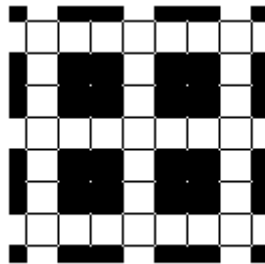
Halftones are black-and-white representations of grayscale data. Halftones are typically used to plot images so that the plotted image looks similar to the original scanned document. PREDITOR uses two methods to implement halftoning: *dithering* and *screening*.

dithering Dithering uses various patterns to fill in enough pixels to create the illusion of grayscale. The patterns can be anything, such as a checkerboard.



50% dither

screening Screening simulates the traditional dot patterns found in printed media such as newspapers. The dots may be arranged at an angle to avoid visual artifacts.



50% screen

The Halftone Dialog Settings

Output density (dpi)	The output file resolution can be selected here. The output file density does NOT have to be the same as the input image density. Higher output densities are generally more accurate (higher input densities also help produce more accurate output). Higher output densities require more disk space to save the halftoned output file.
Scale	The output file scale can be selected here. Values greater than 100% make the output image larger than the input image. Values less than 100% make the output image smaller than the input image.
Halftone Method	Select Ordered Pattern or Error Diffusion. The ordered patterns include dither and screen patterns. The error diffusion method uses an unordered dither based on the Floyd-Steinberg method.
Halftone Pattern	This selects the ordered dither or screen pattern to use. Small patterns capture line art more accurately but have fewer gray levels. Larger patterns have more gray levels and are better suited to photographs. Note that the selection of halftone pattern does NOT affect the speed of the halftoning operation.
Full Input Grayscale Resolution	Used with ordered patterns. When this selection is OFF, a single input gray value is used to create each halftone dot or dither region. When this selection is ON, multiple input gray values are used to create each

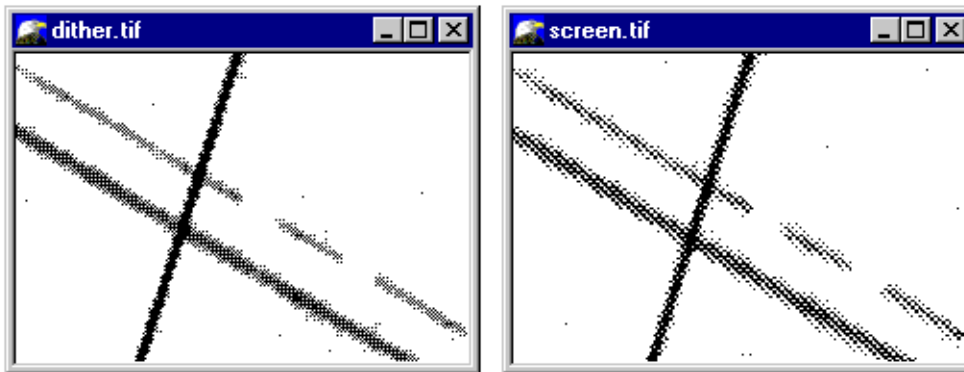
halftone dot or dither region, increasing the accuracy of the output data. Note that selecting Full Input Grayscale Resolution does NOT affect the speed of the halftoning operation.

Output File Scan Line Orientation

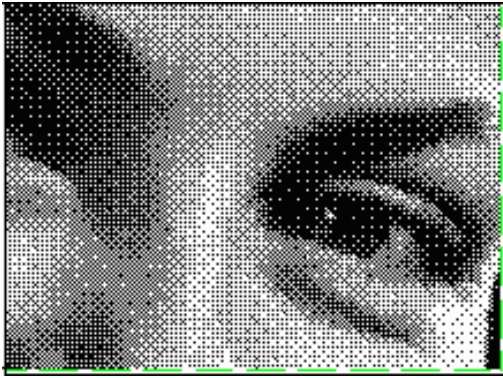
The scanline orientation of the output file can be selected here. You can use the Output File Scan Line Orientation menu to select the orientation or click on the orientation icon until the correct orientation appears.

Error Diffusion and Ordered Pattern

Dithering works best with line art originals, while screening works best with continuous tone originals such as photographs. Screening tends to lose fine details in line art due to the grid size required to create the halftone dot. Hint: The 2x2 dither grid is especially useful to capture line art originals.



Dither vs. screen. Note the loss of line quality in the screen



8X8 dither



8x8 screen



Error Diffusion (Floyd-Steinberg) dither

Hints

- Use the 2x2 dither pattern to create halftones that are primarily line art.
- When halftoning line art, remember that you may specify a Black value above 0 and a White value below 255 in the Image-Adjust dialog. For example, setting Black to 50 and White to 200 usually helps to distinguish dark and light areas of the output. This has the effect of thresholding the obvious black and white portions of the data to solid black and solid white, while the hard-to-threshold gray colors in the middle are sorted into just a few shades of gray. This can help to make some drawings easier to read when plotted.
- Setting Full Input Grayscale Resolution is recommended for most applications when ordered patterns are used. This feature increases the accuracy of the output. This mode helps to resolve fine lines and other features in the halftone output, and scanned continuous tone photos

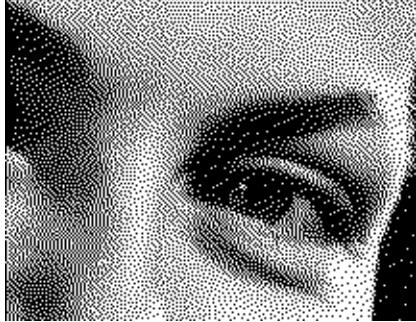
usually look better when plotted halftone data is generated using Full Input Grayscale Resolution.

- Screens are generally used with high resolution output devices such as typesetting machines that prepare art for printing presses. Dither patterns are generally used with lower resolution output devices such as computer monitors and laser printers.

Halftone Patterns

This section provides a visual catalog of halftone patterns available in PREDITOR.

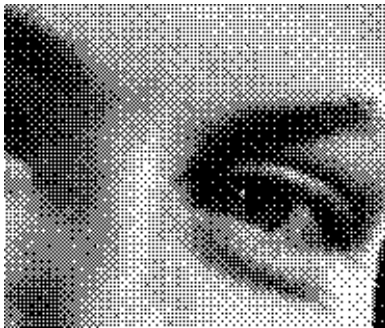
Error Diffusion



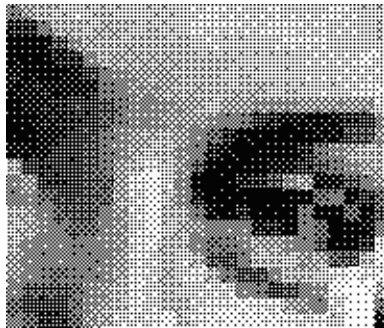
Error diffusion is an unordered pattern. This method may provide the best quality if you want to avoid visually repeating patterns. Error diffusion halftones typically do not compress well and file sizes may be large.

Note: Dither patterns do not compress well for file formats such as TIFF Group 4, which uses line to line changes to encode data. Formats such as PackBits may be better to store dithered files.

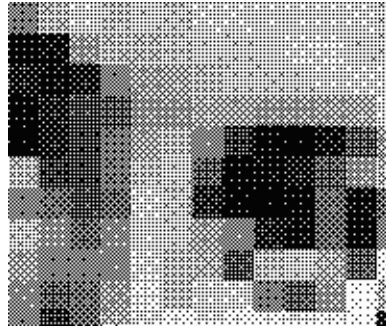
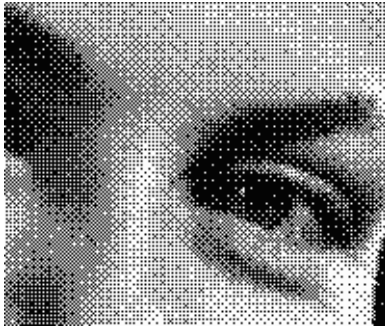
Full Input Resolution ON



Full Input Resolution OFF



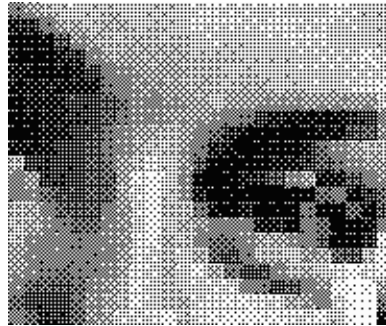
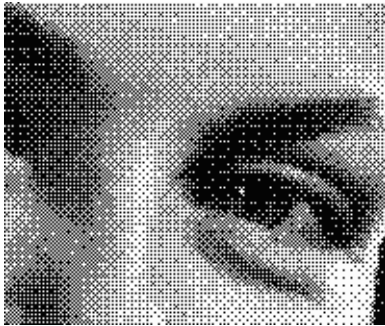
dither 1 (8x8 grid with 64 grayscale levels)



dither 2 (16x16 grid with 256 grayscale levels)

Full Input Resolution ON

Full Input Resolution OFF



dither 3 (8x8 grid with 64 grayscale levels)



dither 4 (2x2 grid with 4 grayscale levels)



dither 5 (4x4 grid
with 16 grayscale
levels)



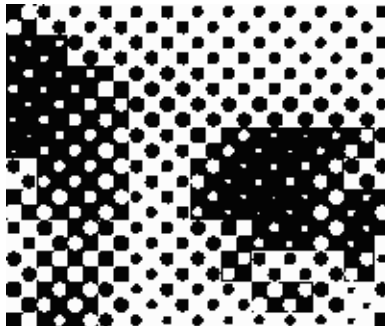
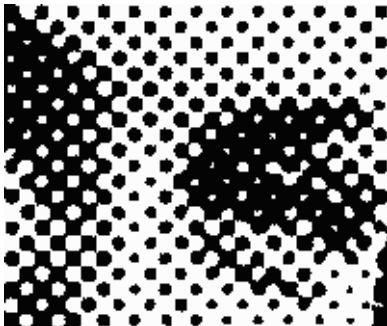
screen 1 (6x6 grid
with 18 grayscale
levels)

Full Input Resolution ON

Full Input Resolution OFF



screen 2 (8x8 grid
with 32 grayscale
levels)



screen 3 (16x16
grid with 128
grayscale levels)



screen 4 (8x8 grid with 64 grayscale levels)



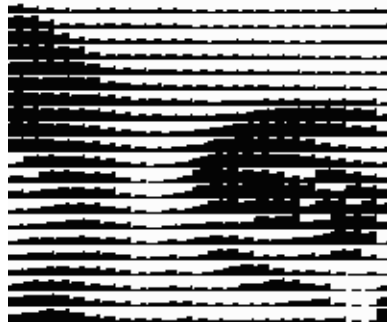
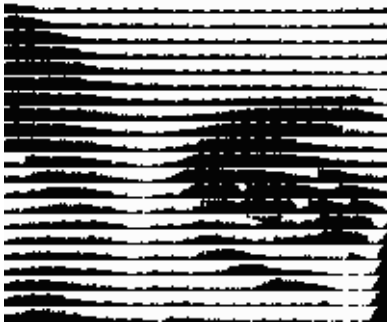
screen 5 (8x8 grid with 64 grayscale levels)

Full Input Resolution ON

Full Input Resolution OFF



screen 6 (4x4 grid with 16 grayscale levels)



screen 7 (8x8 grid with 64 grayscale levels)

Table of Output Lines Per Inch (lpi)

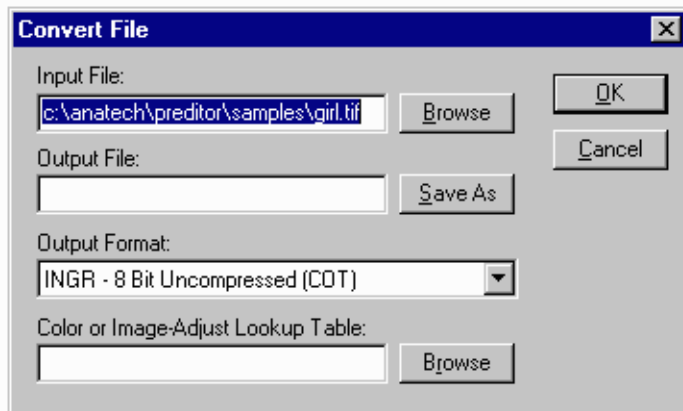
	<i>2x2 grid</i>	<i>4x4 grid</i>	<i>6x6 grid</i>	<i>8x8 grid</i>	<i>16x16 grid</i>
<i>100 dpi</i>	50 lpi	25 lpi	16.7 lpi	12.5 lpi	6.25 lpi
<i>200 dpi</i>	100 lpi	50 lpi	33.3 lpi	25 lpi	12.5 lpi
<i>300 dpi</i>	150 lpi	75 lpi	50 lpi	37.5 lpi	18.75 lpi
<i>600 dpi</i>	300 lpi	150 lpi	100 lpi	75 lpi	37.5 lpi

To use, cross reference grid size (top row) with output file density (left column). Read the output lpi from the table.

The output screen frequency, in lines per inch, depends on the original resolution of the grayscale file in dpi and on the grid pattern. The larger the grid pattern, the more grayscale levels the pattern can represent, though at a smaller output screen frequency.

File Convert

The Convert function is used to convert between different grayscale and color file formats.



1. To use convert, select the input file and an output filename and an output format. Press OK.
2. If desired, select a lookup table file to use with the Convert operation. Lookup tables are described below.

Lookup Tables

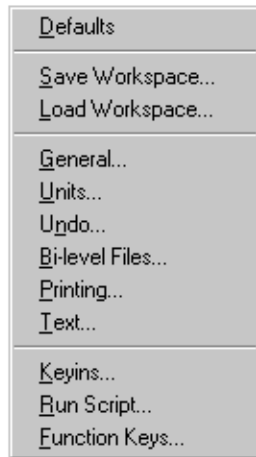
There are two types of lookup tables (LUT) that may be used with the Convert operation:

- Color Classification LUT. This LUT is created with SCANSMITH CLASS and is used to color classify data. Use this type of LUT when converting from a 24 bit color format to an 8 or 4 bit color format. This type of LUT is also used by SCANSMITH SCAN-C to perform real time color classification during scanning. A default LUT (rgb2pal.lut) is provided in the samples directory.
- Image Adjust LUT. This LUT is created in SCANSMITH PREDITOR with the Image Adjust feature. It applies brightness, contrast, gamma, and high and low cut-off values to the three channels of color data or to the single channel of grayscale data. Use this type of LUT to modify the color or grayscale output of the conversion operation. This type of LUT is also used by SCANSMITH SCAN to adjust scanned grayscale data and by SCANSMITH SCAN-C to adjust scanned color and grayscale data.

Converting Bi-Level Images

To convert between bi-level image formats, open the bi-level file in SCANSMITH PREDITOR and use the Save As feature to save the file in a different format.

File Preferences

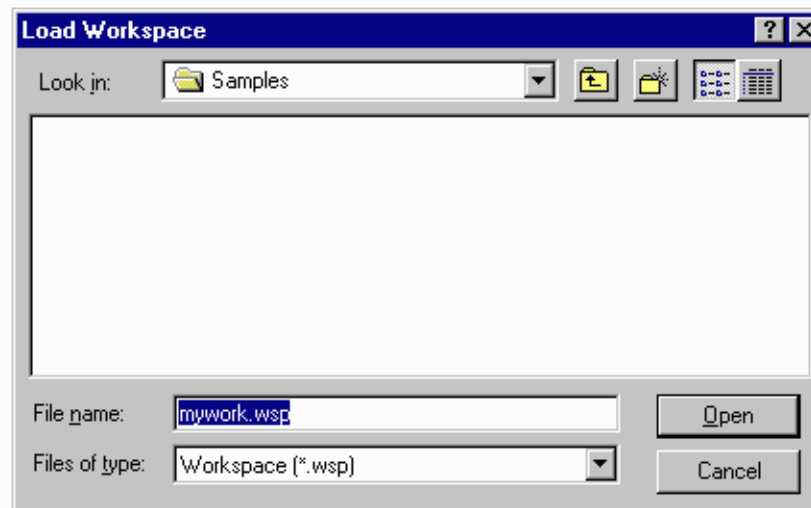
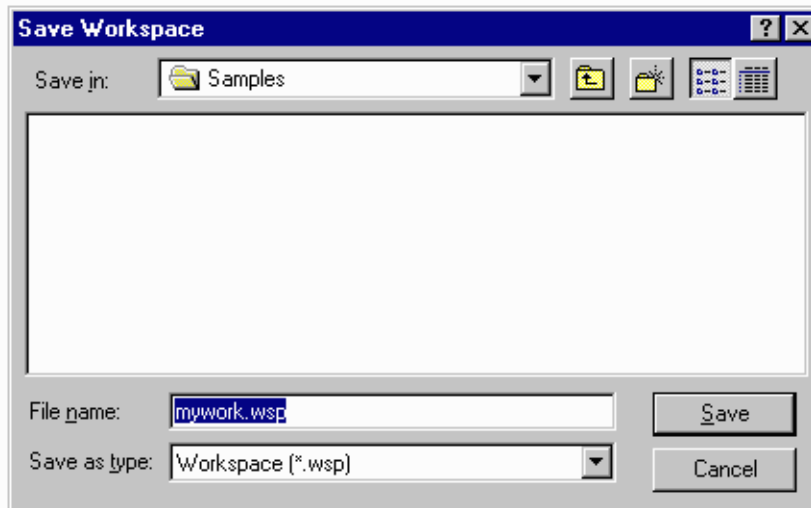


Preferences Defaults

The Preferences-Defaults option resets all PREDITOR settings to their default condition.

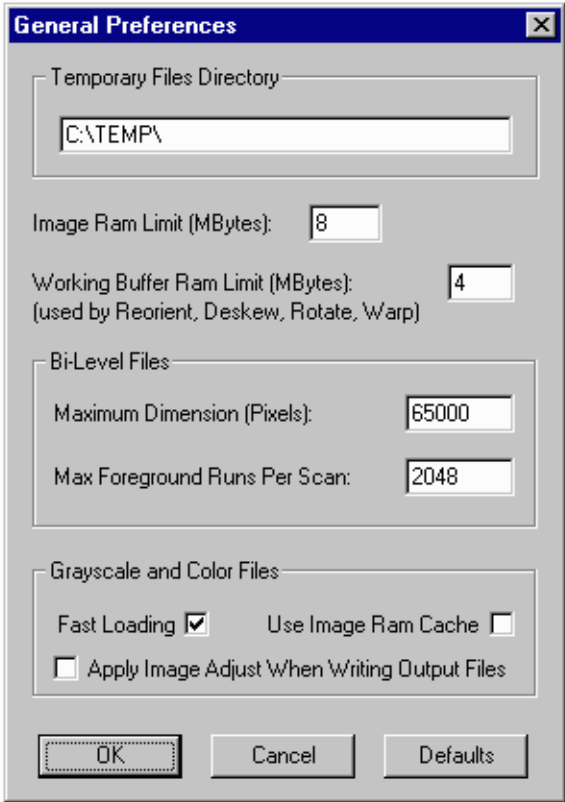
Preferences Save and Load Workspace

Save and Load workspace are used to store and retrieve PREDITOR settings. If you have entered settings you want to save, select Save Workspace to save the settings. You can save different workspaces as separate workspace files to keep track of different PREDITOR environments.



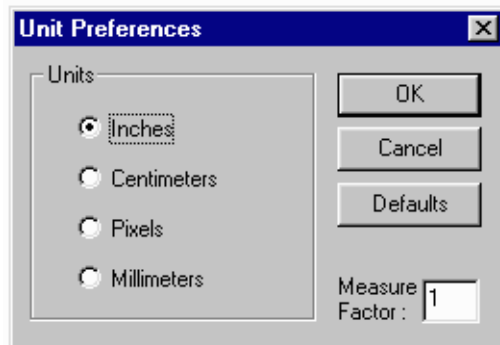
Preferences General

The General Preferences dialog provides control over memory usage and disk swapping options. These options are important for very large raster files. The Temporary Files Directory allocates a directory location for temporary files that PREDITOR generates. The Image RAM Limit limits the amount of system memory that can be used to store image data. Image data above this limit may be stored in temporary files on disk and swapped into memory as needed. The *Working Buffer Ram Limit* assigns additional memory resources for operations such as deskew. Complex operations run faster if more memory is available. The maximum dimension specifies the largest bi-level file allowed. The maximum dimension applies to the X and Y axis of the image. The *Maximum Foreground Runs Per Scan* limits the run length complexity of line art. No more than the specified number of run lengths, which are consecutive series of black or white pixels, are allowed on a line (run lengths above this number are ignored and appear as whitespace). *Fast loading* allows concurrent display while the file is being read from disk. The *Use Image Ram Cache* option enables or disables the use of the Image Ram Limit to allocate a cache for Fast Loading. *Apply Image Adjust When Writing Output Files* causes the image adjust settings to be applied to output data when performing Save, Save As, Crop, Resample, Rescale, or Reorient (note that the adjustments are applied to the data itself, and if the new file is reloaded, the Image Adjust settings are again applied to the image -- use *Image-Adjust-Identity* to negate image adjustments on the current image, if needed).



Preferences Units

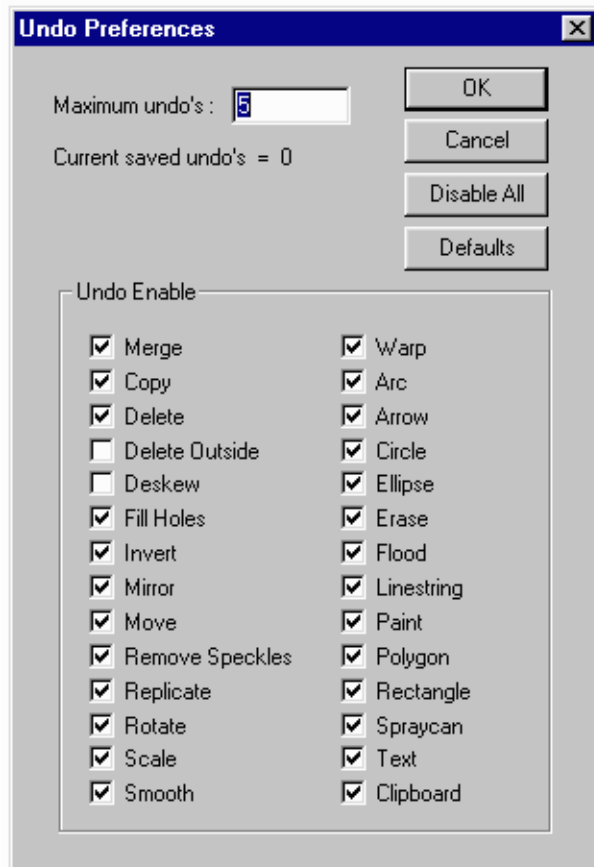
The Unit Preferences dialog selects the units for measurements in PREDITOR. Measurements and image location in the status bar use the specified units. Note that you can also use the Image-Info dialog to set the Units selection.



The Measure Factor is applied to distances measured by the Measure command. The X/Y coordinates and total distance are scaled by the value specified as the Measure Factor.

Preferences Undo

The Undo Preferences selections enable or disable undo's for these operations. The maximum undo's limits the numbers of stored operations that you can undo. Note that some operations include a separate "Enable undo when entire image is selected" option that applies only to operations on the entire image and does not affect the status of undo options you select in Undo Preferences.

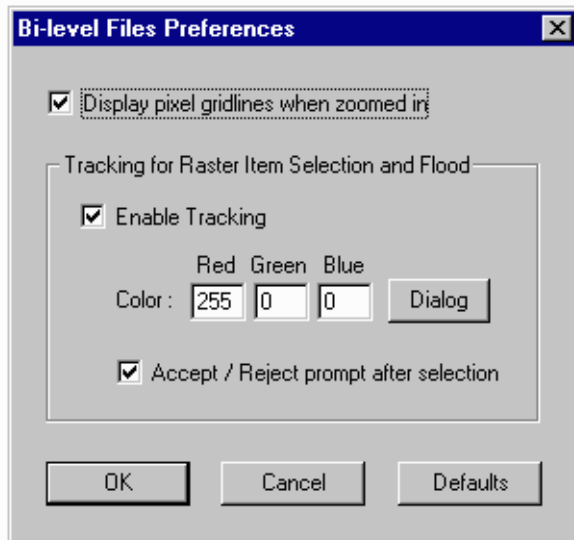


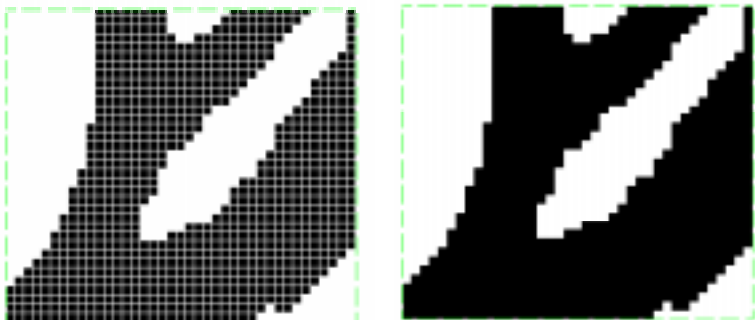
PREDITOR creates temporary files to store undo data. Increasing the maximum number of undo's will increase disk usage.

Preferences Bi-Level Files

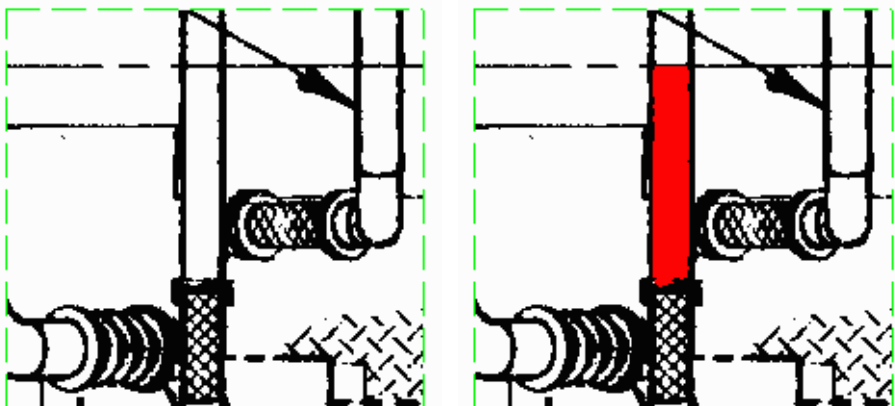
The Bi-Level Files Preferences control gridlines and raster item tracking.

- Gridlines** You can enable or disable pixel gridlines when zoomed in (see below).
- Tracking** When tracking is enabled, functions that use raster item selection (copy, delete, mirror, move, replicate, rotate, scale, clipboard copy, clipboard cut) and the flood function display the region for the operation in the tracking color. You can enter red, green, and blue values to specify the tracking color, or press the Dialog button to bring up an interactive color selection dialog.
- You can abort the operation while tracking is in progress by pressing the right mouse button or the Escape key.
- Accept/Reject** If Accept/Reject prompt after selection is enabled, you can accept or reject the region selected for the operation. Press the left mouse button to accept the selection, or the right mouse button (or Escape) to reject the selection.





This sample shows some bi-level raster data with and without gridlines.

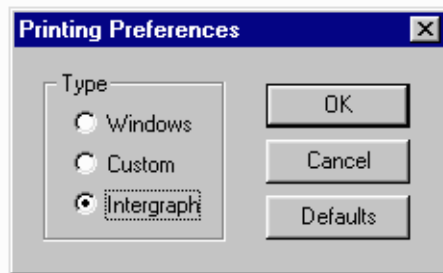


Before and after making a flood selection. The shaded area shows the extent of the flood. Pressing the left mouse button accepts the selection.

Preferences Printing

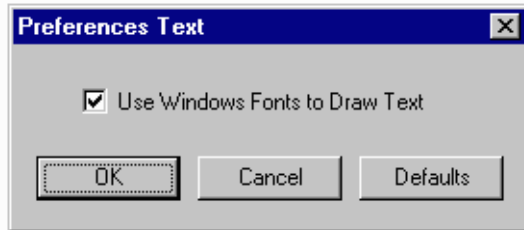
The Printing Preferences selects Windows, Custom, or Intergraph printing.

- | | |
|------------|---|
| Windows | Plot using the Windows printer drivers. |
| Custom | Plot using custom drivers for HP RTL plotters. You must have an HP RTL compatible plotter on the local parallel port. |
| Intergraph | Plot using Intergraph Plotting, if installed. Intergraph Plotting provides fast plotting of large raster images. |



Preferences Text

Text Preferences allows you to select whether to use Windows fonts (including TrueType fonts) or the built in Hershey fonts for use with the Draw-Text command. The default is to use Windows fonts. The Hershey fonts are included for compatibility with previous releases of SCANSMITH PREDITOR. (Also see Draw-Text.)



Preferences Keyins

The keyins selection brings up the Keyins dialog. You can enter keyins in this dialog as an alternative to making menu and dialog selections. Refer to the Keyins Appendix of this manual for a comprehensive list of keyins.



Sample keyins:

```
arc
preferences undo circle on
undo
copy dialog
```

You can enter multiple keyins on the same line, using a semicolon delimiter between keyins. For example:

```
arc outline weight 10; arc
```

Keyins are not case sensitive, you can enter keyins either in upper or lower case characters. You can shorten keyins to 4 or more letters. For example, the command:

```
preferences defaults
```

can be shorted to:

```
pref defaults
```

or even:

```
pref defa
```

Keyins that have pixel dimensions as parameters (text height, linestring weight, etc.) can now also be specified in inches or centimeters. The default is still pixels. For example:

```
text height 150
text height 0.5inches
text height 1.125cm
```

The inches or centimeters value is converted to pixels using the pixel density of the active image currently opened.

Special Keywords

You can access internal parameters with special keywords in keyin commands. Keywords are prefixed with the dollar sign (\$) character. PREDITOR replaces the keyword with the value of the internal parameter. Keywords include:

\$FILENAME	Path of raster file name
\$DPI	Pixel density
\$WIDTHPIXELS	Image width
\$HEIGHTPIXELS	Image height
\$SLO	Scan line orientation (0-7)
\$MEASUREPIXELX	X pixel location of mouse
\$MEASUREPIXELY	Y pixel location of mouse
\$MEASUREDISTANCE	Measured distance (pixels)
\$MEASUREANGLE	Measured angle (degrees)
\$MEASURERED	Red value of pixel
\$MEASUREGREEN	Green value of pixel
\$MEASUREBLUE	Blue value of pixel
\$MEASUREINDEX	Index in color palette
\$MEASUREGRAY	Grayscale value of pixel
\$MEASUREUNITSX	X location in default units
\$MEASUREUNITSY	Y location in default units
\$NEXTFILE	Next raster file in directory
\$PREVFILE	Previous raster file in directory

The keywords can be used in conjunction with the "write" keyin command in script files or special function keys. You can use keywords to create text log files with information about the current image. For example:

```

unlink c:\info.txt
write c:\info.txt This is the file c:\info.txt
write c:\info.txt
write c:\info.txt image file = $FILENAME
write c:\info.txt width      = $WIDTHPIXELS pixels
write c:\info.txt height     = $HEIGHTPIXELS pixels
write c:\info.txt density    = $DPI, slo = $SLO
write c:\info.txt
write c:\info.txt *** end of file ***

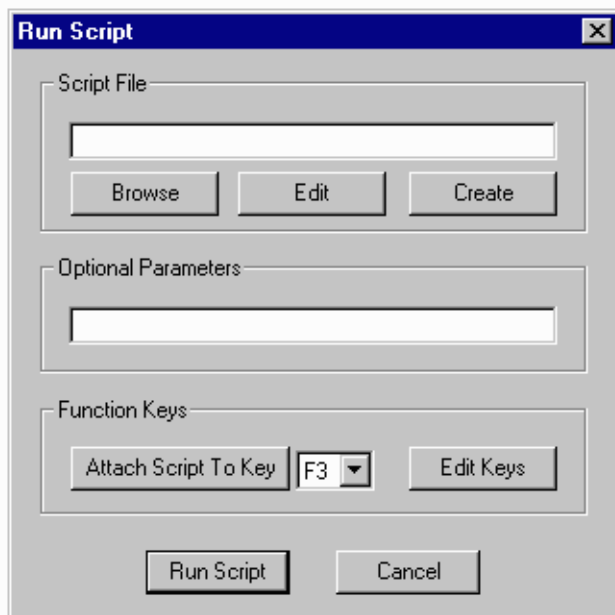
```

Note that the \$NEXTFILE keyword can be used in a keyin associated with a special function key to close the current file and open the next file in a directory. Example:

```
file close; file open name $NEXTFILE
```

Preferences Run Script

The Run Script feature lets you run a prepared list of keyins. You can save a series of one or more keyins as a text file, called a script.



Script files are simple ASCII text files of keyin commands. Script files can be used to automate repeated sets of commands. You can create, edit, and run script files from the File-Preferences-Run Script dialog. The following script loads a raster file, performs cleanup commands, and rewrites the original file:

```

preferences defaults
file open name myfile.tif
smooth
remove speckles size 10
remove speckles
fill holes size 6
fill holes
file save
file close

```

Notice that the script above sets the command defaults to a known state (`preferences defaults`), and then changes only those parameters that need to be customized. This way, you can ensure the script works in later sessions of SCANSMITH PREDITOR, even though you may have changed the settings of some operations.

Running the Script

Pressing the Run Script button starts a selected script file. Or you can run script files from within keyin commands.

Assuming the previous example is stored as the file `cleanup.scr`, the keyin command to execute the script can have one of the following forms:

```
script run name cleanup.scr
script run name cleanup
@cleanup.scr
cleanup.scr
cleanup
```

Notice that the simplest method is to just enter the script name (without the `.scr` file extension). The `.scr` file extension for scripts is a convention. You can create script files with any file extension.

Script Parameters

You can configure scripts to accept up to 99 parameters when the script file is executed. The parameters are passed when you run the script. For example, we will rewrite the script file `cleanup.scr` to allow the user to pass the file name, speckle size, and hole size to the script. Each parameter starts with a percent character (%) followed by the number of the parameter:

```
preferences defaults
file open name %1
smooth
remove speckles size %2
remove speckles
fill holes size %3
fill holes
file save
file close
```

We would then call the script with a command of the following form:

```
cleanup myfile.tif 10 6
```

The parameter `%0` is the script name itself. Two adjacent percent characters (`%%`) are replaced with one percent character.

Nested Script Files

Script files can call another script file. After the nested script file terminates, control returns to the next line of the original script file.

Comment Lines

Comment lines can be added to scripts by preceding the line with a slash (/) character.

```
/ script file = cleanup.scr
/
/ calling sequence : cleanup [raster_file]
/                      [speckle_size] [hole_size]
/
preferences defaults
/
file open name %1
/
smooth
/
remove speckles size %2
remove speckles
/
fill holes size %3
fill holes
/
file save
file close
/
/ end of file : cleanup.scr
```

Running Scripts on Startup

You can start scripts automatically upon starting a PREDITOR session. Use the Window properties dialog to update the command reference for PREDITOR to run the script. Notice that each script parameter is passed with a -p qualifier when starting PREDITOR from an external Windows command line. (See Appendix B, Command Line Options.)

```
c:\anatech\preditor\preditor.exe
    -script cleanup -p myfile.tif -p 10 -p 6
```

Batch Processing

You can create batch programs to run PREDITOR, load files, perform specific raster processing tasks, and then close, without ever needing to manually operate the software.

To set up a batch processing workflow, create a script that loads the raster file, performs raster cleanup, and then exits. Use the exit command. For example:

```
/ script file = cleanup.scr
/
/ calling sequence : cleanup [raster_file]
/                   [speckle_size] [hole_size]
/
preferences defaults
/
file open name %1
/
smooth
/
remove speckles size %2
remove speckles
/
fill holes size %3
fill holes
/
file save
file close
/
exit
/
/ The script will never get here since the exit
/ command causes PREDITOR to exit.
/
/ end of file : cleanup.scr
```

Special Keyins

There are several special purpose keyins that are useful to control batch operations:

The unlink command is used to delete files.

```
unlink [pathname]
```

example:

```
unlink c:\data\scantmp.tif
```

The dos command is used to execute DOS keyin commands:

```
dos [keyin]
```

example:

```
dos copy newfile.tif e:\archive\
```

The execute command is used to execute external applications:

```
execute [application]
```

example:

```
execute notepad c:\mydir\def.txt
```

The wait command makes the script pause to wait for a file. This is useful to coordinate SCANSMITH PREDITOR batch actions with external applications. You can use the wait command to respond to semaphore signals, in the form of files saved by the external application:

```
wait [pathname]
```

example:

```
wait c:\mydir\flag.dat
```

The script delete on/off command controls whether the script file itself is automatically deleted after execution of the script file is completed. This may be useful to create scripts that clean up after themselves.

```
script delete on
script delete off
```

The save workspace on exit command lets you control whether the workspace is automatically saved when exiting SCANSMITH PREDITOR. You may wish to turn off the automatic saving of workspace when executing scripts that affect the workspace, so that the workspace for subsequent sessions of SCANSMITH PREDITOR will not be affected by your script.

```
preferences save workspace exit on
preferences save workspace exit off
```

Other Programming Languages

You can create programs with other programming languages (such as C, C++, and Visual Basic) that call the PREDITOR executable program with a script of commands to execute.

Script Datapoints

Coordinate data points can be added to scripts for commands that require mouse data points. For example, a script to delete all data outside a defined rectangle:

```
/ script file = zap.scr
/
delete outside region rectangle
delete outside shrink borders on
delete outside
mouse units inches
mouse delta off
mouse left 10.0 12.0
mouse left 20.0 30.0
/
/ end of file : zap.scr
```

Using Script Parameters, the same script could be rewritten:

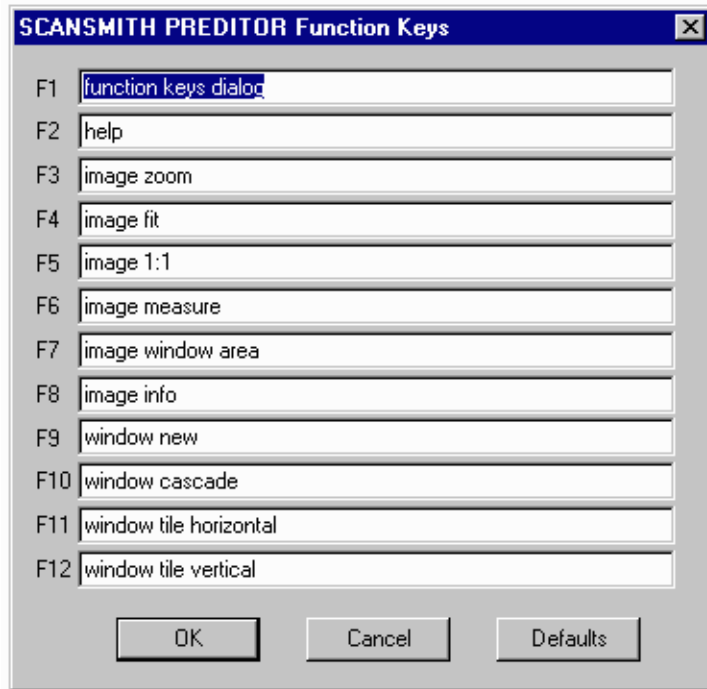
```
/ script file = zap.scr
/
/ calling sequence : zap [x1] [y1] [x2] [y2] [units]
/
delete outside region rectangle
delete outside shrink borders on
delete outside
mouse units %5
mouse delta off
mouse left %1 %2
mouse left %3 %4
/
/ end of file : zap.scr
```

Aborting Scripts

Press the escape (ESC) key to abort a script file in progress. Processing is halted and control of PREDITOR is returned to the normal operating mode.

Function Keys

The Function Keys dialog lets you view and change the way keyboard function keys are mapped to PREDITOR functions. To reassign a function key, type in a keyin command, or script name, in the selected text field, then press OK. To reset function keys to their default mapping, select Defaults.



Function keys can be programmed with SCANSMITH PREDITOR keyin commands or scripts. For example, the following script draws a circle with an X at the current mouse position:

```
/ script file = drawx.scr
/
/ calling sequence : drawx [size] [units] [weight_pixels]
/
preferences defaults
/
mouse units %2
mouse delta on
mouse set last move
/
circle mode outline
circle outline weight %3
circle method radius
```

```
circle
mouse left 0.0 0.0
mouse left %1 %1
mouse move -%1 -%1
/
linestring weight %3
linestring
mouse left -%1 %1
mouse left %1 -%1
mouse right %1 -%1
mouse move -%1 0.0
mouse left -%1 0.0
mouse left %1 %1
mouse right %1 %1
/
mouse delta off
image measure
/
/ end of file : drawx.scr
```

To execute the script drawx.scr, set function key 3 (F3) to:

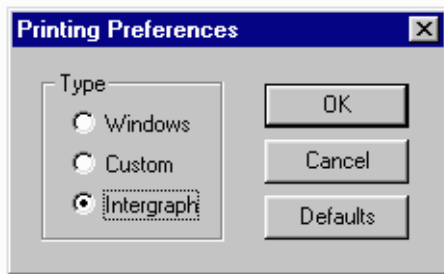
```
drawx 0.1 inches 10
```

using the File-Preferences-Function Keys dialog. Load a raster image file. Move the cursor to the location you want to draw the X, and press function key F3. A circle with an X is drawn at the current cursor position.

File Print / Print Setup

The Print command launches the print dialog for the currently selected printing method. There are three printing methods that you can select:

- | | |
|---------------------|---|
| Windows Printing | Plot using the Windows printer drivers. |
| Custom Printing | Plot using custom drivers for HP RTL plotters. You must have an HP RTL compatible plotter on the local parallel port. |
| Intergraph Plotting | Plot using Intergraph Plotting, if installed. Intergraph plotting provides fast plotting of large raster images. |



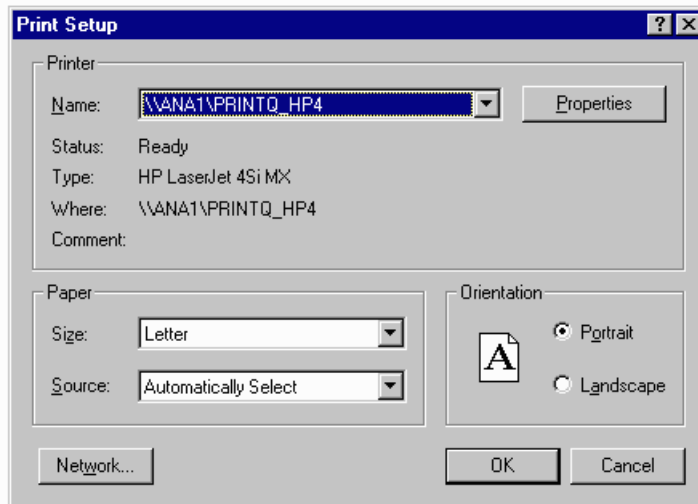
To select a printing method:

1. Select File-Print Setup.
2. The Printing Preferences dialog appears. Select one of the printing methods, Windows, Custom, or Intergraph. Press OK.
3. To print an image, select File-Print. The print dialog for the currently selected printing method appears.

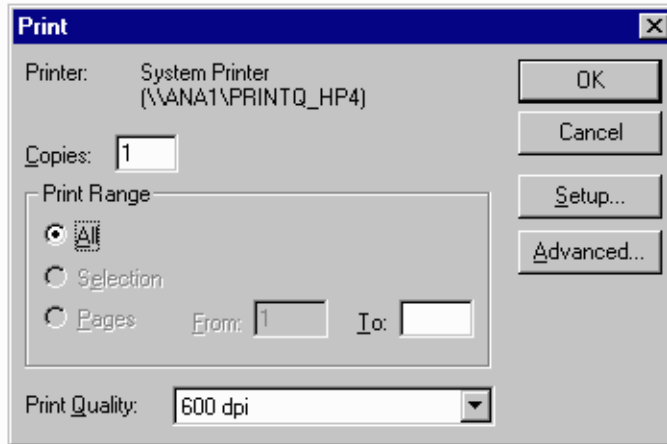
Windows Printing

Windows printing is described in the illustrations and table that follows:

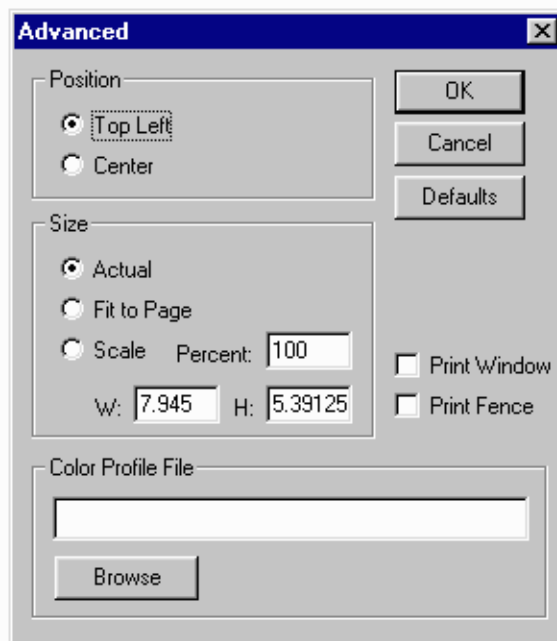
Windows Print Setup



Windows Print Setup uses a standard Windows print setup dialog.



The File-Print selection brings up the Print dialog. Click on Advanced to bring up the Advanced dialog.



The Advanced dialog offers options on the placement and sizing of the image in the printed page. Print Window specifies printing only the area defined by the active window. Print Fence specifies printing only the area selected by the current fence (see Datapoints-Place Fence).

You can specify a color profile (PRF) file, if one is available, to remap image colors to plotter output colors for optimized color printing.

Windows Print Options

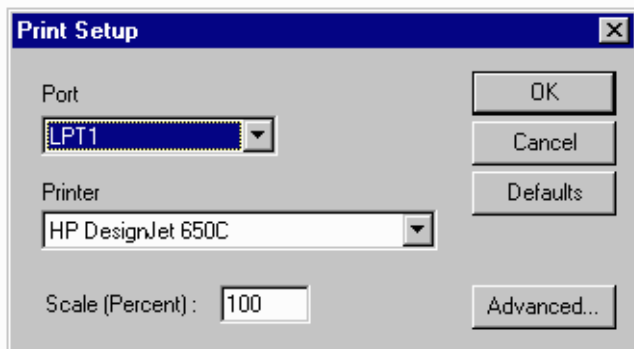
Copies	Specify number of copies to print.
Print Range	
All	Always selected.
Selection	N/A
Pages	N/A
Print Quality	Set output printer resolution in dpi.
Setup	Brings up the Windows Print Setup dialog.
Advanced	Bring up the Advanced Windows print options.

Advanced Windows Print Options

Top Left	Justify the printed output to the top left of the printed page.
Center	Center the printed output on the printed page.
Size	
Actual	Print image at actual size as per size data in file header.
Fit to Page	Print image fitted to the current paper size in printer.
Scale	Scale the image up or down per the specified factor.
W: H:	Specify exact height and width for the printed image.
Print Window	Print only the displayed window.
Print Fence	Print only the currently selected fence region.
Defaults	Reset Windows printing default settings.
Color Profile File	Specify a color profile (PRF) file to match the raster image colors to the plotter colors. Color Profile (PRF) files may be generated with SCANSMITH MATCH.

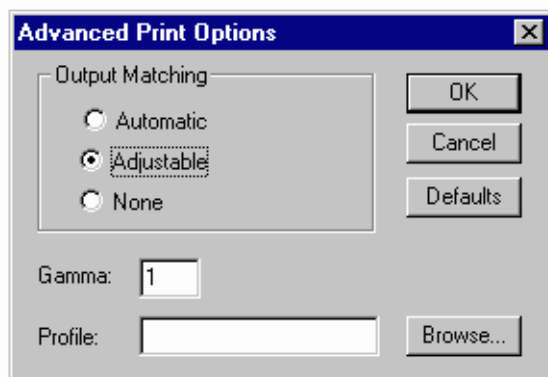
Custom Printing

PREDITOR features built-in support for plotters using HP RTL, such as the HP650C for plotting color, grayscale, and line art data. The printer must be connected to one of the PC's parallel ports. PREDITOR uses a built-in printer driver to control the HP RTL plotter, rather than a Microsoft Windows printer driver.



The File-Print or File-Print Setup selection bring up the Print Setup dialog for Custom printing. Select the parallel port, printer, and scaling factor. Press OK to print.

If the active image is a 24-bit color file, the Advanced button appears in the dialog. The Advanced button brings up Advanced Print Options.



The Advanced Print Options dialog lets you specify a color profile file, if one is available. The gamma factor, if entered, makes all color channels brighter (gamma is applied after the profile file is applied to the data). The Automatic option uses built-in color profile settings.

Custom Print Options

Port	Select local printer port.
Printer	Select HP RTL compatible printer.
Scale	Scale the image up or down per the specified factor.
Defaults	Reset Custom printing default settings.
Advanced	Bring up the Advanced Custom print options.

Advanced Custom Print Options

Output Matching

Automatic Use PREDITOR's built-in profile file for the HP-650C plotter.

Adjustable Enable the gamma and profile settings (see below).

None Apply no output adjustment.

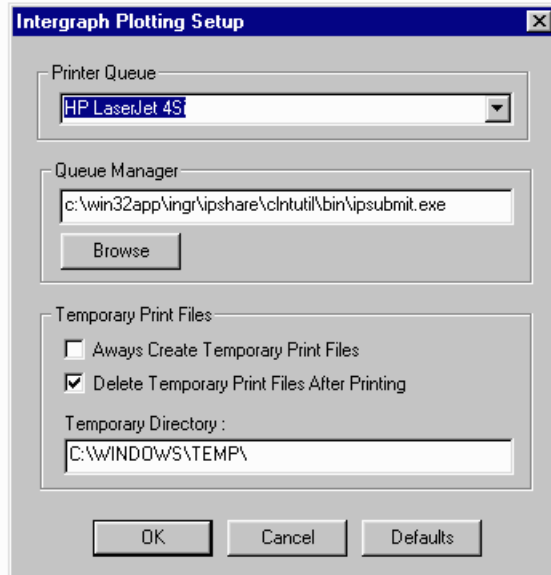
Gamma Manually set a gamma setting which lightens or darkens midtones. Values above 1 lighten midtones; values below 1 darken midtones.

Profile Specify a profile (PRF) file to match the raster image colors to the plotter colors. Color Profile (PRF) files may be generated with SCANSMITH MATCH.

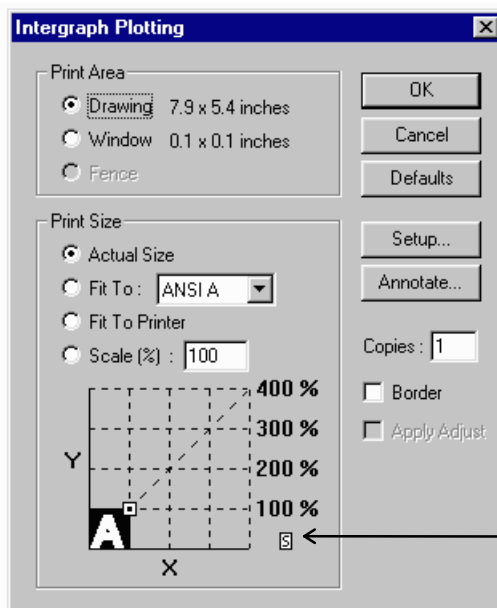
Defaults Reset Advanced Custom printing default settings.

Intergraph Plotting

Refer to Intergraph Plotting Software documentation for details on configuring the Intergraph Plotting printer driver. If Intergraph Plotting is selected as the printing method, selecting File-Print brings up the Intergraph Plotting dialog.



The Intergraph Plotting Print Setup dialog sets up the Intergraph Plotting print queue. Refer to Intergraph Plotting documentation for more information about Intergraph Plotting.



Use the interactive scale tool to select a scale setting or enter the scale setting in the Scale text field.

Intergraph Plotting Options

Print Area

- Drawing Print the entire drawing.
- Window Print only the displayed window.
- Fence Print only the currently selected fence region.

Print Size

- Actual Size Print image at actual size as per size data in file header.
- Fit To... Print image fitted to a selected paper size.
- Fit To Printer Print image fitted to the current paper size in printer.
- Scale Scale the image up or down per the specified factor.

Setup

Bring up the Print Setup dialog (refer to Intergraph Plotting documentation for configuration information.)

Annotate

Annotate the image.

Copies

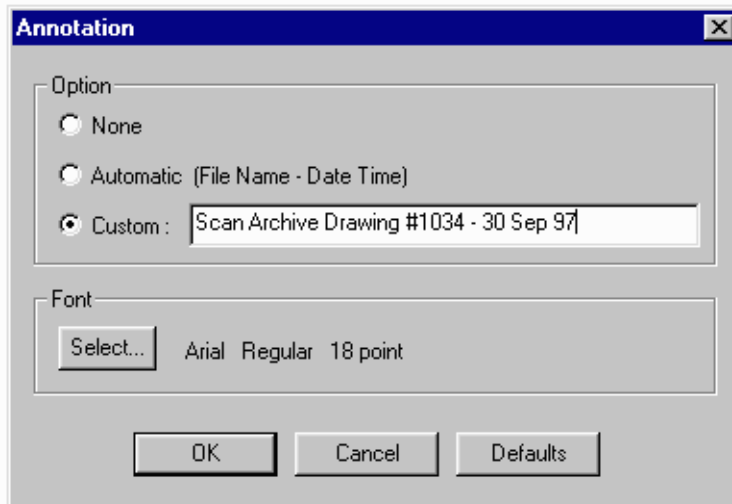
Specify number of copies to print.

Border

Enable a border line around printed image.

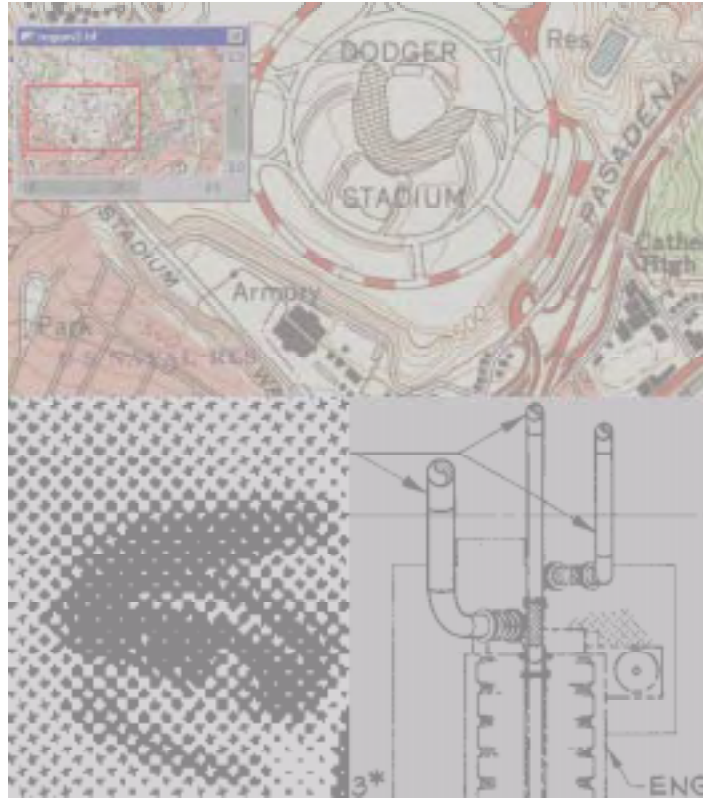
Apply Adjust

Apply current image adjustment settings to print.



Intergraph Plotting Annotation dialog lets you append an annotation to plots.

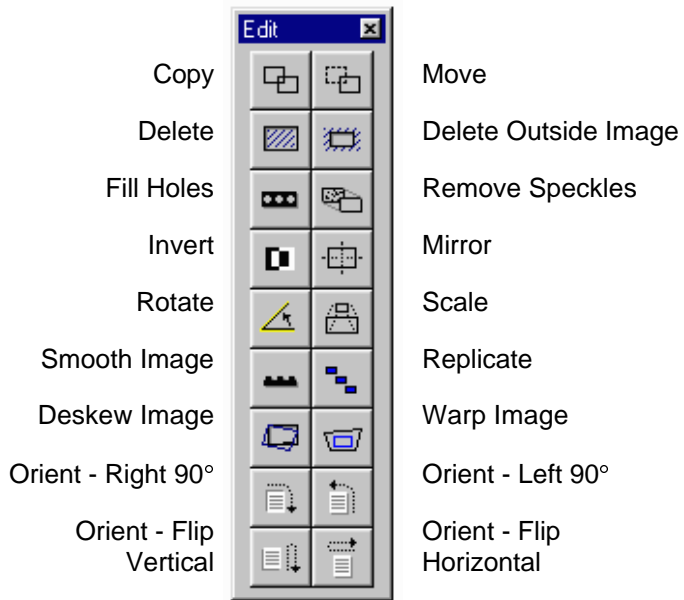
EDIT MENU



SCANSMITH PREDITOR

4. Edit Menu

This section provides information about the PREDITOR Edit menu.



Edit Undo



Undo the most recent action for the currently selected file. Note that multiple undo's are possible up to the number set in File-Preferences-Undo. Also, the Preferences dialog lets you configure operations for which undo's are allowed.

Every raster operation for which undo's are possible is saved as a temporary file. Certain operations that affect all raster pixels in a large drawing, such as rotating and entire image, are especially storage intensive.

1. To use Undo, click on the Undo button or select Edit-Undo. Continue clicking on the Undo button to perform additional undo operations.

Edit Redo

Redo the most recent action undone for the currently selected file.

1. To use Redo, select Edit-Redo.

Edit Copy

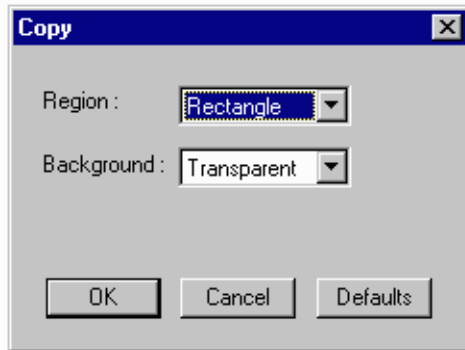


The Edit-Copy command copies a rectangular or polygonal area or raster item from one part of a raster image to another part of the same image.

When the Background selection is Transparent, background pixels from the selected Copy region do not replace the original pixels in the Copy destination area. When copying color or grayscale images, all pixels except the background color pixels are copied. When the Background selection is Opaque, the entire selected Copy region replaces the original pixels in the Copy destination area.

If *Copy Foreground Pixels Only* is enabled, only foreground pixels are copied to the Copy destination area. This option, available for color and grayscale files, is especially useful to copy individual raster features of a particular foreground color.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



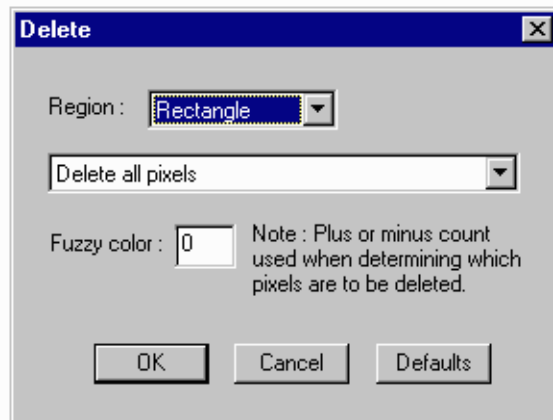
1. To use Copy, select Edit-Copy or click on the Copy icon in the toolbar.
2. Select the Region type, Rectangle or Polygon, for copying.
3. Select the Background method for copying. The Opaque method replaces all pixels at the copy destination with pixels from the source region. The Transparent method replaces only foreground pixels.
4. Use the mouse to select the region or raster item. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the Copy region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)
5. Enter a source reference point and a destination reference point.

Edit Delete



The Delete command deletes a selected rectangular or polygonal area or a raster item and replaces it with the background color.

Use the Image–Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Delete, select Edit-Delete or click on the Delete icon in the toolbar.
2. Select the Region type for deleting.
3. Select the Delete method. *Delete all pixels* replaces all pixels in the region with background pixels. *Delete foreground pixels only* deletes only the foreground pixels. *Delete all non-foreground pixels* deletes everything except foreground pixels in the delete region.
4. For color or grayscale images, you can specify a Fuzzy color. Predictor uses fuzzy colors to delete a range of colors bounded in RGB color space by a cube that extends out from the foreground color by the specified number of fuzzy colors. For palette color images, Delete uses the RGB value corresponding to pixels' color indices to calculate the fuzzy range of colors to delete.

Fuzzy colors works with Delete selections as follows:

Delete all pixels	Deletes all pixels. Fuzzy colors setting is not used.
Delete foreground pixels only	Deletes pixels of the foreground color and deletes pixels in the fuzzy range of the foreground color.
Delete all non-foreground pixels	Deletes all pixels outside of the fuzzy range of the foreground color.
Delete pixels defined by values in fence.	Deletes all pixels of the color of any pixel within the current fence, and deletes all pixels within the fuzzy range of the fenced pixels. See Datapoints-Place Fence.

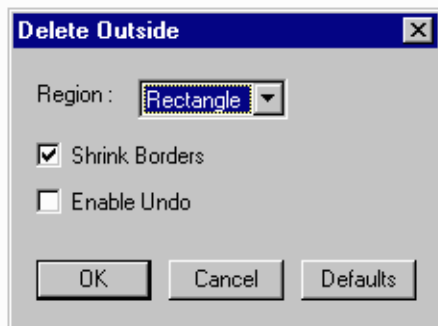
5. Use the mouse to select the region. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the Delete region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)

Edit Delete Outside



The Delete Outside command is used to delete all data outside of a selected rectangular or polygonal area.

The Shrink Borders option, available for bi-level images, causes raster image borders to automatically shrink to fit the remaining foreground data after the Delete Outside Operation. The Enable Undo option enables or disables undo's for this operation (also see File-Preferences-Undo).



1. To use Delete Outside, select Edit-Delete Outside or click on the Delete Outside icon in the toolbar.
2. Select the Region type for deleting. Also select Shrink or Undo options.
3. Use the mouse to select the region. Foreground pixels outside the region are then deleted and replaced with background pixels.

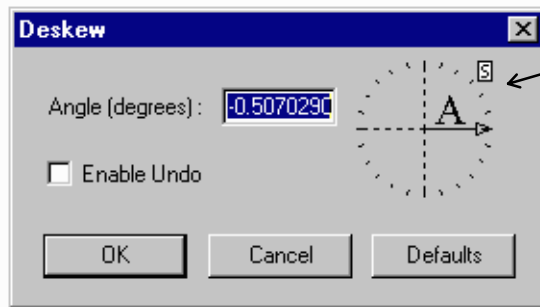
If the Shrink Borders option is enabled, a Shrink Borders operation occurs automatically after the Delete Outside finishes. The Enable Undo selection has the same effect as toggling the Undo checkbox in the File-Preferences-Undo dialog.

Edit Deskew



The Deskew command uses a user-drawn line to determine an angle of rotation. The data is then rotated to the specified angle.

The Enable Undo option, available for bi-level files only, enables or disables undo's for this operation (also see File-Preferences-Undo).



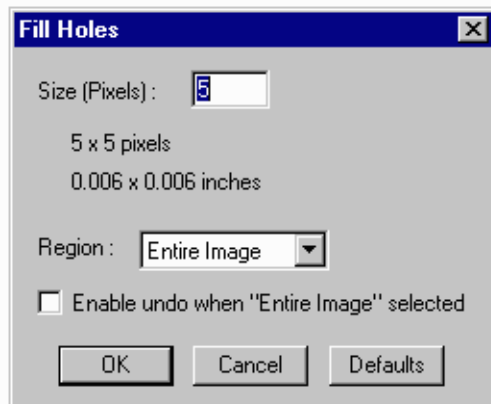
Drag the interactive tool to set the Deskew angle. Click on "S" to set the snap angle.

1. To use Deskew, select Edit-Deskew or click on the Deskew icon in the toolbar.
2. Use the mouse to interactively draw a line that specifies the deskew angle. Enter two points to define the line.
3. The Deskew dialog appears and displays the angle indicated by the line you drew. If the angle is acceptable, click on OK. You can also use the angle tool in the Deskew dialog to select an angle, or enter the angle manually.
4. The entire image rotates by the specified angle.

Edit Fill Holes



The Fill Holes command fills holes less than or equal to the specified size in a selected rectangular area or for the entire image. The *Enable Undo when "Entire Image" selected* option enables or disables undo's of the Fill Holes operation only for operations performed on the entire image. Undo's for rectangular areas are controlled by the settings in File-Preferences-Undo. This command is available for bi-level image files only.



1. To use Fill Holes, select Edit-Fill Holes or click on the Fill Holes icon in the toolbar. The Fill Holes dialog appears.
2. Select the size of holes to fill. Holes with a diameter larger than the specified number of pixels are not filled.
3. Select the region for hole filling. Also check the Enable undo box if you want to be able to undo a hole filling operation when filling holes on the entire image. Then press OK.
4. If Entire Image is specified, the hole filling operation occurs immediately. If a rectangular region is specified, use the mouse to select the region. Background pixels that appear as “holes” in the data up to the specified diameter are filled in with foreground pixels.

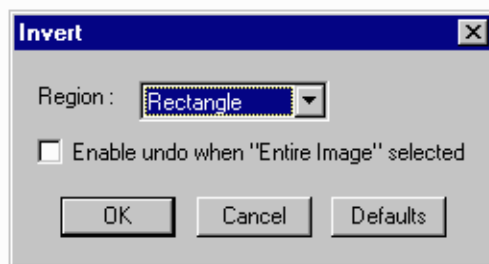
Edit Invert



The Invert command inverts pixels in a selected rectangular or polygonal area, or for the entire image.

For bi-level images, foreground and background pixels are inverted. For 24-bit color and grayscale images, the pixel values are inverted to create a negative image. For 8-bit color images, the color indexes are inverted.

The *Enable Undo when "Entire Image" selected* option enables or disables undo's of the Invert operation only for operations performed on the entire image. Undo's for selected areas are controlled by the settings in File-Preferences-Undo.

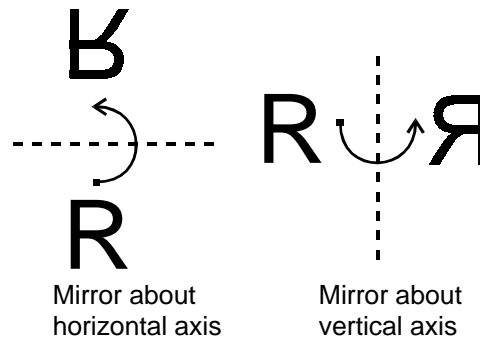
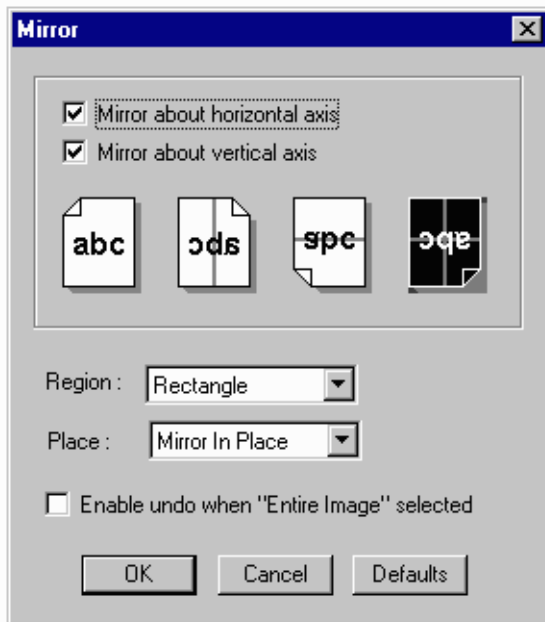


1. To use Invert, select Edit-Invert. The Invert dialog appears.
2. Select the Region type for inverting. Also check the Enable undo box if you want to be able to undo an invert operation when inverting on the entire image. Then press OK.
3. If Entire Image is specified, the invert operation occurs immediately. If a rectangular or polygonal region is specified, use the mouse to select the region. All foreground and background pixels in the selected region are reversed.

Edit Mirror



The Mirror command mirrors a selected rectangular or polygonal area or raster item, or the entire image horizontally or vertically. The *Enable Undo when "Entire Image" selected* option enables or disables undo's of the Mirror operation only for operations performed on the entire image. Undo's for mirroring selected areas or raster items are controlled by the settings in File-Preferences-Undo.



1. To use Mirror, select Edit-Mirror. The Mirror dialog appears.
2. Use the checkboxes or the mirror icons to select whether to mirror about horizontal and/or vertical axis. Select the Region type for mirroring. Select Mirror in Place to mirror the selected region about its center, or Mirror and Copy, or Mirror and Move, to copy or move the region to a new location and mirror it about a reference point you select. Also check the Enable undo box if you want to be able to undo an invert operation when mirroring on the entire image. Press OK.
3. If Entire Image is specified, the mirror operation occurs immediately. If a rectangular or polygonal region or raster item is specified, use the mouse to select the region or the raster item. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or

reject the Mirror region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)

4. If you select the Place option Mirror and Copy or Mirror and Move, enter a source and destination point for the mirror operation.
5. The mirror operation “flips” data about the specified axis.

Edit Move



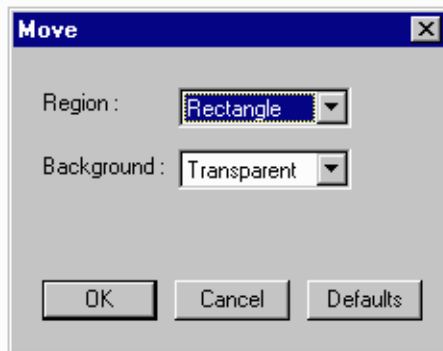
The Edit-Move command moves a selected rectangular or polygonal area or a raster item from one part of a raster image to another part of the same image. Depending on the status of the "Opaque" option the data either replaces the original data in the target area or is combined with that data.

When the Background selection is Transparent, background pixels from the selected Move region do not replace the original pixels in the Move destination area. When copying color or grayscale images, all pixels except the background color pixels are copied.

When the Background selection is Opaque, the entire selected Move region replaces the original pixels in the Move destination area.

If *Move Foreground Pixels Only* is enabled, only foreground pixels are copied to the Move destination area. This option, available for color and grayscale files, is especially useful to copy individual raster features of a particular foreground color.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Move, select Edit-Move. The Move dialog appears.
2. Select the Region type and Background method for moving. The Opaque method replaces all pixels at the move destination with pixels from the source region. The Transparent method replaces only foreground pixels.
3. Use the mouse to select the region. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the

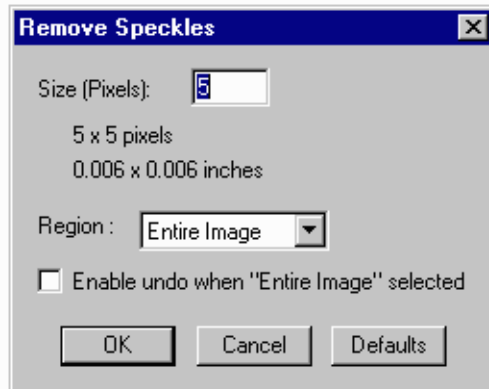
Move region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)

4. Enter a source reference point and a destination reference point.

Edit Remove Speckles



The Remove Speckles command removes speckles less than or equal to the specified size in a selected rectangular area or for the entire image. The *Enable Undo when "Entire Image" selected* option enables or disables undo's of the Remove Speckles operation only for operations performed on the entire image. Undo's for rectangular areas are controlled by the settings in File-Preferences-Undo. This command is available for bi-level image files only.



1. To use Remove Speckles, select Edit-Remove Speckles or click on the Remove Speckles icon in the toolbar. The Remove Speckles dialog appears.
2. Select the size of speckles to remove. Speckles with a diameter larger than the specified number of pixels are not removed.
3. Select the region for speckle removal. Also check the Enable undo box if you want to be able to undo a speckle removal operation when removing speckles on the entire image. Then press OK.
4. If Entire Image is specified, the speckle removal operation occurs immediately. If a rectangular region is specified, use the mouse to select the region. Foreground pixels that appear as "speckles" in the data up to the specified diameter are replaced with background pixels.

Edit Replicate



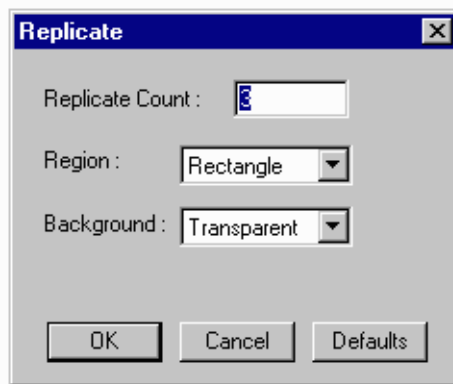
The Replicate command makes multiple copies of a specified region or raster item. The copies are placed in a series following the first copy. The Replicate Count specifies the number of copies to make. The Region can be a rectangular or polygonal area, or a raster item.

When the Background selection is Transparent, background pixels from the selected Replicate region do not replace the original pixels in the Replicate destination area. When replicating color or grayscale images, all pixels except the background color pixels are copied.

When the Background selection is Opaque, the entire selected Replicate region replaces the original pixels in the Replicate destination area.

If *Replicate Foreground Pixels Only* is enabled, only foreground pixels are copied to the Replicate destination area. This option, available for color and grayscale files, is especially useful to replicate individual raster features of a particular foreground color.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Replicate, select Edit-Replicate.
2. Select the Replicate Count, which specifies the number of copies to make of the selected region or raster item. Select the Region type.
3. Select the Background method for the replicate operation. The Opaque method replaces all pixels at the replicate destination with pixels from

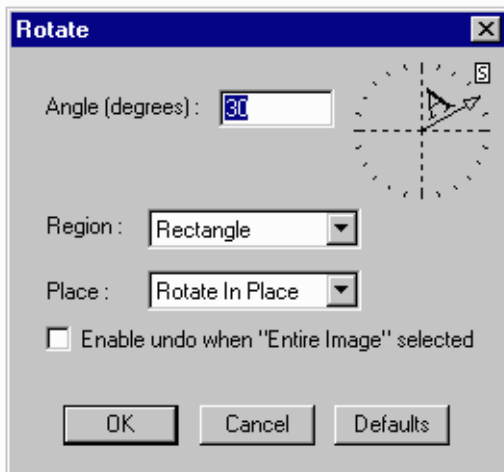
the source region. The Transparent method replaces only non-background pixels.

4. Use the mouse to select the region or raster item. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the Replicate operation in progress or reject the Replicate region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)
5. Enter a source reference point and a destination reference point. The source region or raster item is copied to the destination, and then additional copies appear at successive locations specified by the source and destination point.

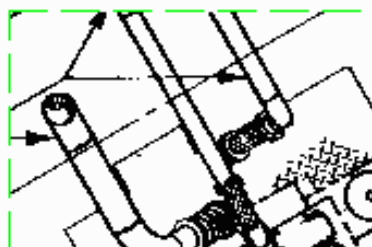
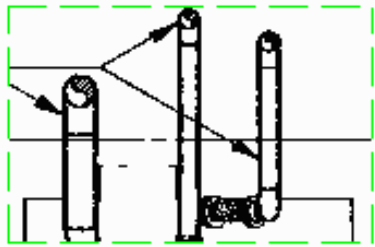
Edit Rotate



The Rotate command rotates the image according to the specified angle in a selected rectangular or polygonal area, for a raster item, or for the entire image. The *Enable Undo when "Entire Image" selected* option, available for bi-level files only, enables or disables undo's of the Rotate operation only for operations performed on the entire image. Undo's for selected areas or raster items are controlled by the settings in File-Preferences-Undo.



Drag the interactive tool to set the Rotate angle. Click on "S" to set the snap angle.



Before and after the Rotate operation.

1. To use Rotate, select Edit-Rotate.
2. Select the Rotate angle. Select the Region type for the rotate operation. Select Rotate in Place to rotate the selected region about its center, or Rotate and Copy, or Rotate and Move, to copy or move the region to a new location and rotate it about a reference point you select. Press OK.
3. Use the mouse to select the region or raster item. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or

reject the Rotate region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)

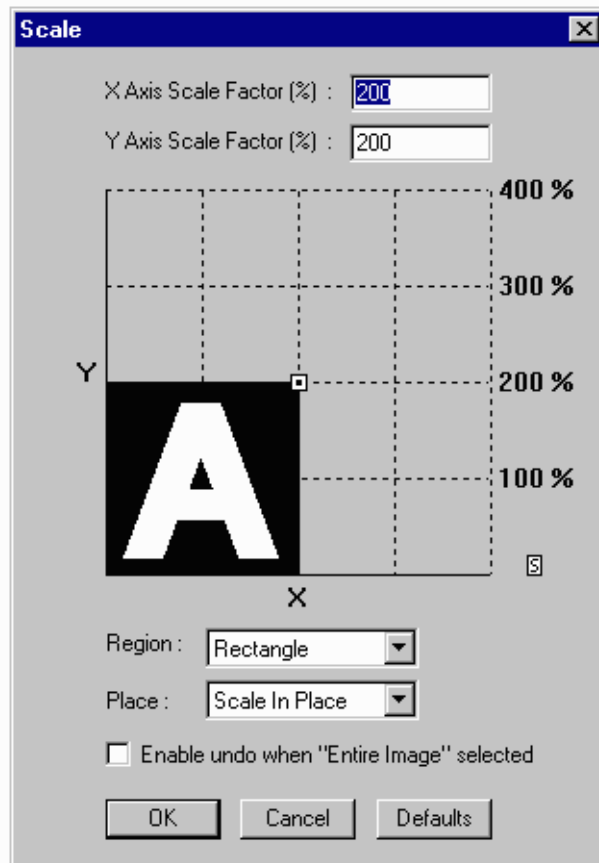
4. If Rotate in Place is selected, the region or raster item is rotated immediately. If Rotate and Copy or Rotate and Move is specified, you must enter a source reference point and a destination reference point to complete the operation.

Edit Scale



The Scale command resizes a selected rectangular or polygonal area, or a raster item, or the entire image.

The *Enable Undo when "Entire Image" selected* option, available only for bi-level files, enables or disables undo's of the Scale operation only for operations performed on the entire image. Undo's for selected areas or raster items are controlled by the settings in File-Preferences-Undo.



1. To use Scale, select Edit-Scale.
2. Select the X and Y Axis Scale Factors by manually keying them in, or with the interactive scale tool. Scaling factors are set in X Axis Scale Factor and Y Axis Scale Factor settings. The Snap Percent dialog (called by pressing "S" in the Rescale dialog) sets increments for the interactive scale tool. Factors above 100% increase the image size and

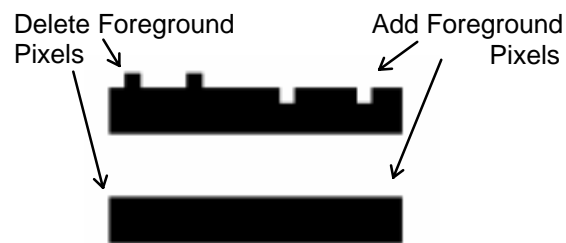
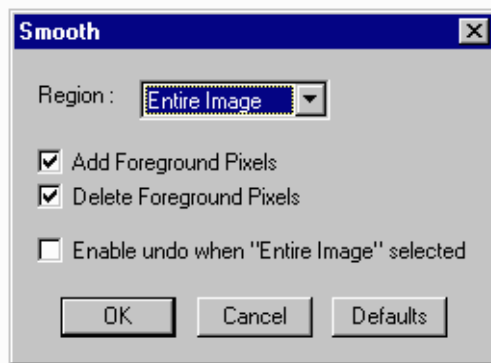
factors below 100% decrease the image size. Note that you can scale at factors greater than 400% by manually keying in the scale factor.

3. Select the Region type for the scale operation. Select Scale in Place to scale the selected region about its center, or Scale and Copy, or Scale and Move to copy or move the region to a new location and scale it about a reference point you select. Also check the Enable undo box if you want to be able to undo a scale operation when scaling the entire image. Press OK.
4. Use the mouse to select the region or raster item. When selecting raster items, if Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the Scale region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)
5. If Scale in Place is selected, the region or raster item is scaled immediately. If Scale and Copy or Scale and Move is specified, you must enter a source reference point and a destination reference point to complete the operation.

Edit Smooth



The Smooth command removes extra foreground pixels and fills in extra background pixels along line edges in a selected rectangular area or for the entire image. Smooth removes or fills single pixel irregularities. Add Foreground Pixels and Delete Foreground Pixels allows independent control of whether foreground pixels are added or deleted. The *Enable Undo when "Entire Image" selected* option enables or disables undo's of the Smooth operation only for operations performed on the entire image. Undo's for rectangular areas are controlled by the settings in File-Preferences-Undo. This command is available for bi-level image files only.

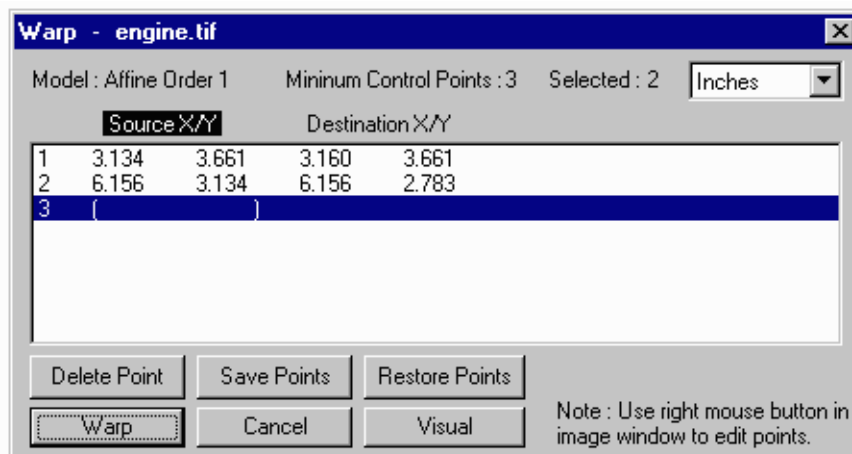


1. To use Smooth, select Edit-Smooth or click on the Smooth icon in the toolbar. The Smooth dialog appears.
2. Select the region for smoothing. You can enable or disable adding or deleting of foreground pixels. Also check the Enable undo box if you want to be able to undo a smooth operation when removing speckles on the entire image. Then press OK.
3. If Entire Image is specified, the smooth operation occurs immediately. If a rectangular region is specified, use the mouse to select the region. The smooth operation cleans up single pixel irregularities.

Edit Warp



The Warp command performs a Helmert, Projective, or Affine warp operation on a selected rectangular or polygonal area or on the entire image. A warp is a two-dimensional topological transformation in which a source area is fitted to a destination area.

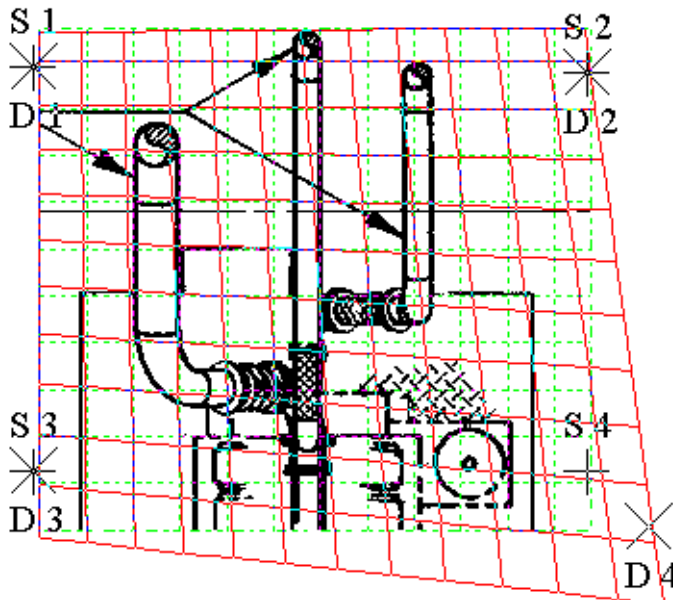


How to Do a Warp

1. Select Edit-Warp.
2. In the Warp dialog, select the warp model (Helmert, Projective, or Affine, described below). Select the region for the warp, Rectangle, Polygon, or Entire Image. Also check the Enable undo box if you want to be able to undo a warp operation when warping the entire image. Select OK when ready.

3. If you selected a Rectangle or Polygon region, now select the region for warping in the image. If you selected Entire Image, skip this step.
4. The Warp Control Points dialog appears. Select source and control points by clicking the mouse in the image. Source points are indicated by vertical and horizontal crosshairs (+) and the label "S". Destination points are indicated by diagonal crosshairs (x) and the label "D." Right click on existing points to change a point. When the minimum number of points required to do the warp are entered, the residual values are displayed.
5. When ready, press the Warp button to perform the warp operation.

The warp operation is visually previewed with green and red lines that appear on the screen as you enter the warp control points. The green gridlines show the source and the red gridlines show the destination. The gridlines let you see how the source region will be fitted to the destination area. This gives you better control over the warp operation.



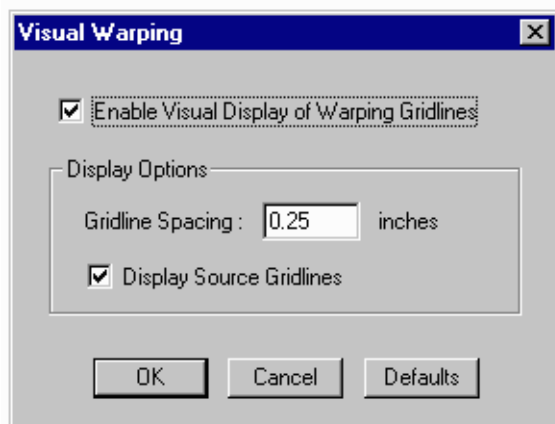
In the upper right corner of the Warp dialog, you can select the units in which to specify points. Select inches, centimeters, or pixels. The units are measured from the lower left corner of the image.

Note that you can save source/destination points as a text file for later use with the same or different raster files. To save or load previously saved points, use the Save Points or Restore Points button.

The *Enable Undo when "Entire Image" selected* option, available for bi-level files only, enables or disables undo's of the Warp operation only for operations performed on the entire image. Undo's for selected areas are controlled by the settings in File-Preferences-Undo.

You can turn the gridlines on and off with the Visual Warping dialog. To bring up the Visual Warping dialog, press the Visual button in the Warp dialog. The following controls are available:

Enable Visual Display of Warping Gridlines	Enables or disables all warping gridlines.
Gridline Spacing	Sets the distance between gridlines.
Display Source Gridlines	Enables or disables only the source (green) gridlines.



What is warping?

A warp is a two-dimensional topological transformation in which a source area is fitted to a destination area. Usually, the Warp feature is used to counteract some influence on the original raster data. For example, a drawing derived from an aerial photograph that has asymmetrical curvature may need to be fitted to a square grid for mapping purposes. Any data captured with a camera may also have lens distortion errors which add another dimension to error correction.

In effect, Warp does reverse interpolation to remove unwanted distortions and arrive at a desired raster form. The source is the raw, distorted data, while the destination is the desired data after the warp operation.

The warp model (Helmert, Projective, Affine) and a series of source/destination point pairs specifies the relationship between source and destination. These pairs specify the relationship between the original drawing and the drawing after warping.

To perform a warp, first determine the nature of data distortion. Is the data bent, or just stretched? How many bends does the data exhibit? Determine the model and order of warp to use. It is best to use the simplest and lowest order warp that will achieve the desired effect. Using high order warps can generate unpredictable results in areas of data away from the source/destination pairs. If a Helmert warp will suffice to correct a particular drawing, use Helmert warping instead of Affine or Projective warping. Projective warping is more time-consuming than a four-point first order Affine warp.

Enter as many source/destination pairs as it takes to accomplish the warp. Think of the destination points as tent stakes which pull on the fabric of the raster data. Entering points close together has the effect of weighting an area. Note that it is often important to include one or more pairs of points near the center of raster data, to better anchor the data while you "pull on the edges."

The warp transformation performs error optimization using a least square fit method to determine the effect of each pair of data points. When more than the minimum number of source/destination pairs are entered, it is often not possible to fit each source point precisely to its destination point. In this case a residual value predicts how much error each destination point will have. The X, Y, and total error distances are displayed in the warp dialog box before executing the warp operation. Depending on your purpose for warping, you may wish to delete and reenter source/destination pairs in order to affect the distribution of residual errors. After you are satisfied with residual distribution, select Warp to start the raster operation.

Speed

For bi-level files, Helmert and first order Affine are faster than other warp methods. This is because Helmert and first order Affine warps use a highly optimized linear resampling algorithm, while other warp methods require more complex non-linear calculations.

Helmert Warp

A Helmert warp operation rotates and scales the raster data. A minimum of two pairs of source/destination points are required to specify a Helmert warp. You can use Helmert warping to deskew and scale drawings.

Projective Warp

Projective warping is designed to correct the effects of roll, pitch, and/or yaw in satellite or aerial photographs. A minimum of four source/destination point pairs are required. Note that projective warping is more time-consuming than a similar four-point first order Affine Warp or Helmert warp.

Affine Warp

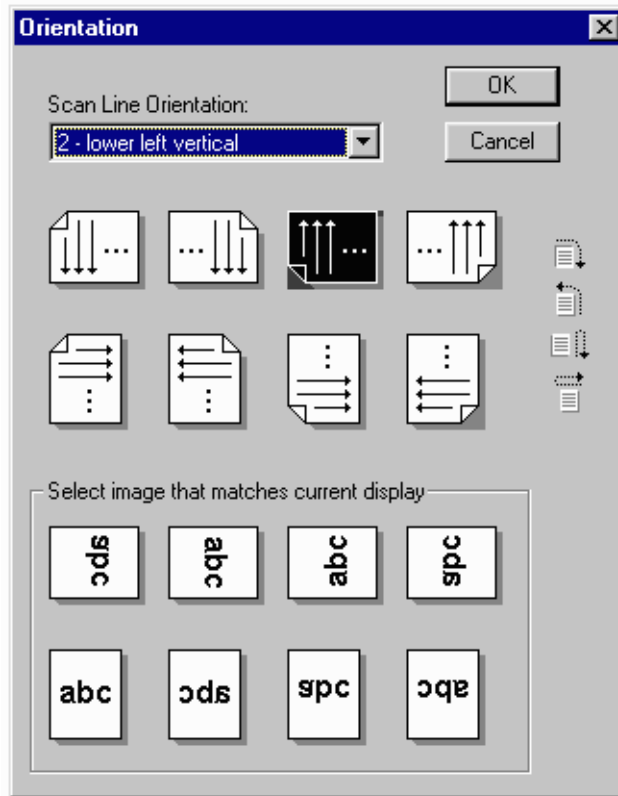
Affine warping stretches data in one or more directions, depending on the warp order. The Order parameter determines the nature of the transformation by setting the mathematical model for the warp. First order polynomials are simple linear stretching (commonly referred to as rubber sheeting). Second order Affine warps use second order polynomials, third order warps use third order polynomials, and so on. A second order polynomial has one bend, such as a parabola. A third order polynomial has an S-shape, and so forth. The order of the Affine warp determines the minimum number of source/destination point pairs.

Order	Minimum number of source/destination point pairs
1	3
2	6
3	10
4	15
5	21

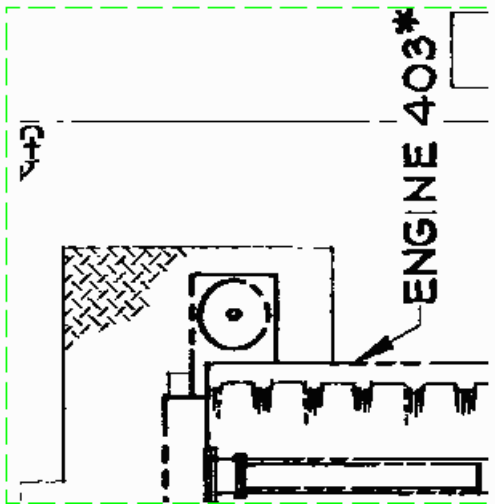
You specify the relationship between source area and destination area with pairs of source and destination points. The type of warp operation determines how many point pairs are required. You can enter more than the minimum number of points. The source regions is fitted to the destination region using a least squares method of error optimization, and residual values that show distance of actual from specified destinations are displayed in the dialog.

Edit Orientation

The Orientation command changes the scan line orientation of the raster image. Scan line orientation is saved in the header of a file. Orientation is used to specify the raster *display*. If you need to actually *reorder* the data with a different scanline orientation, use File-Reorient. Note that not all graphics programs recognize the scan line orientation attribute.

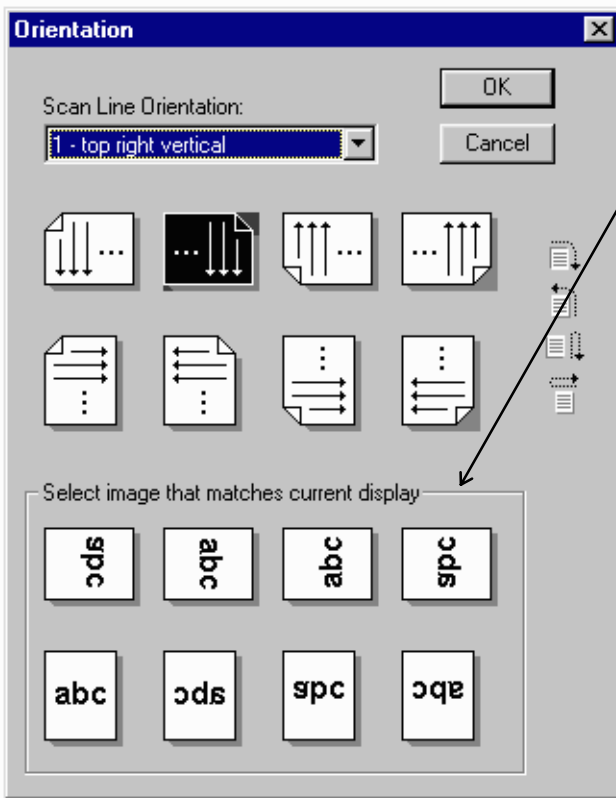


1. To use Orientation, select a new orientation from the Scan Line Orientation menu, or click on one of the orientation icons. Clicking on an icon updates the menu selection, as shown.
2. If you are unsure of which orientation you want, click on the “abc” image icon that matches the display of text characters in the image display.
3. Press OK when ready. SCANSMITH PREDITOR updates the image.
4. To save the new orientation, use File–Save or File–Save As to save the image to disk.



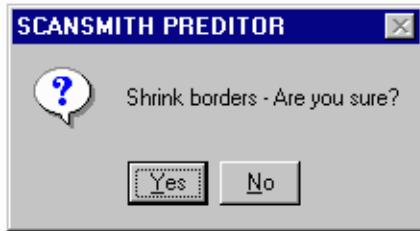
For example, if the display orientation is like the one at left, click on the matching icon and VIEW will automatically select the correct scan line orientation.

After you press OK, the image is displayed in the correct orientation.



Edit Shrink Borders

The Shrink Borders command shrinks the image borders to fit around the data. This command is available for bi-level image files only.



Shrink Borders is useful when there is unnecessary whitespace around the edges of an image. Performing a Shrink Borders operation before saving an image removes extra whitespace so that it does not appear in the output file.

1. To use Shrink Borders, select Edit-Shrink Borders. When prompted, click on Yes to complete the operation.

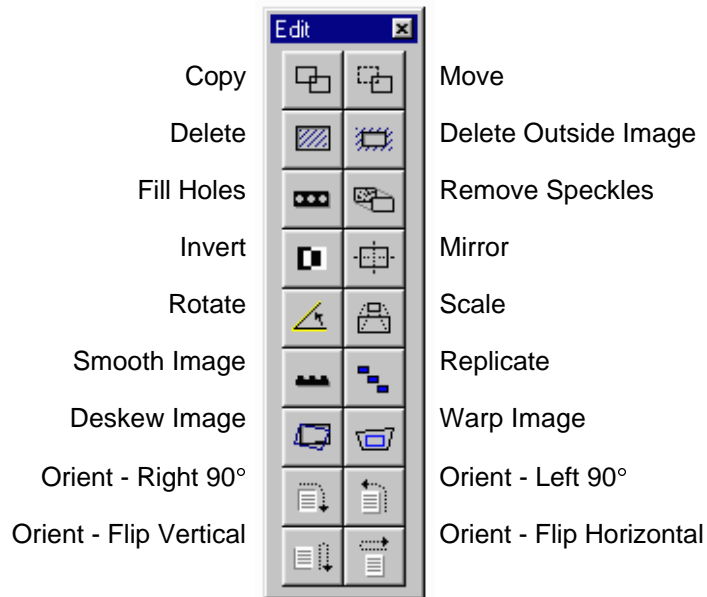
Edit Dialogs

Check the Dialogs menu item to enable display of Edit menu dialogs. When the Dialogs menu item is unchecked, Edit menu functions are started immediately without displaying the dialog, using current settings. The Dialogs item is checked by default when PREDITOR starts. If you don't need to see the dialogs, it may save time to uncheck the Dialogs menu item.

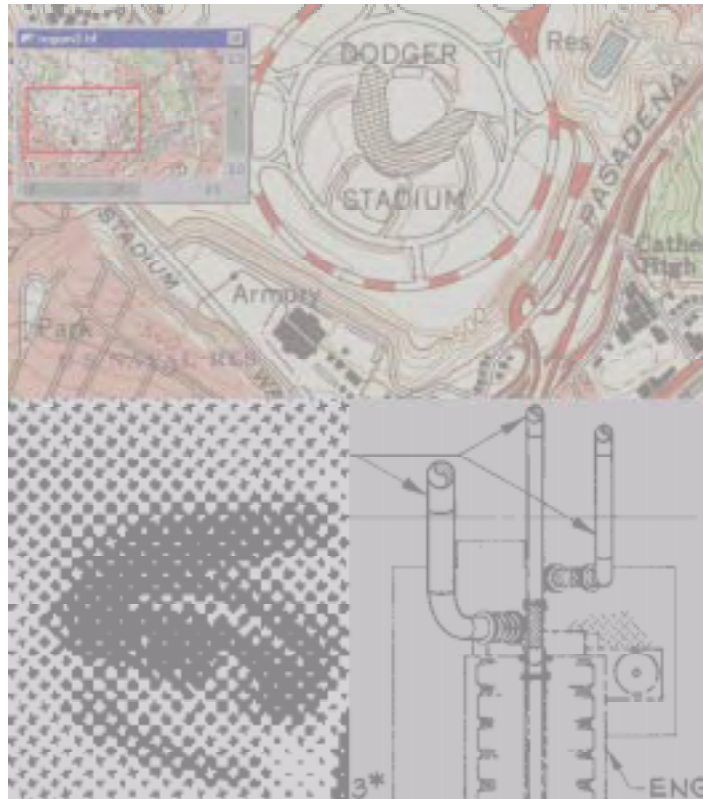
Edit Toolbar

Checking the Toolbar selection displays the Edit menu icon palette. You can drag the icon palette around the Windows desktop. Drag on the corner of the toolbar to change its row/column layout, as needed.

Clicking the *left mouse button* on the icons in the icon palette executes the corresponding command in the Edit menu. Clicking the *right mouse button* on the icons in the icon palette brings up the dialog for that command.



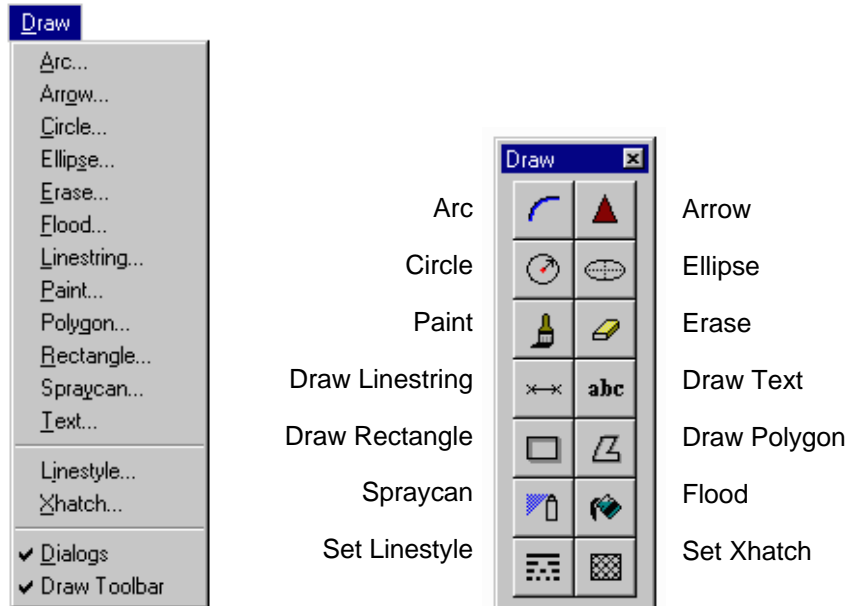
DRAW MENU



SCANSMITH PREDITOR

5. Draw Menu

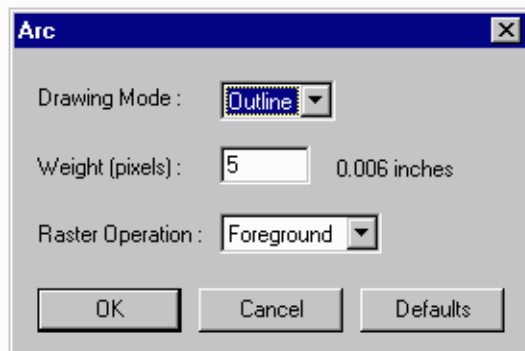
This section provides information about the PREDITOR Draw menu.



Draw Arc



The Arc function draws circular arcs. Place two endpoints for the arc, then select another point for curvature.



1. To use Draw Arc, select Draw-Arc.
2. Select Filled or Outline mode. Filled mode creates filled arc segments, while Outline mode creates arc outlines using the current linestyle.
3. Select Weight. Weight specifies line width in pixels.
4. Select the Raster Operation to specify drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). Press OK when ready.
Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.
5. Use the mouse to draw the arc. Enter two points in the image to specify the arc endpoints, and a third point to specify curvature.

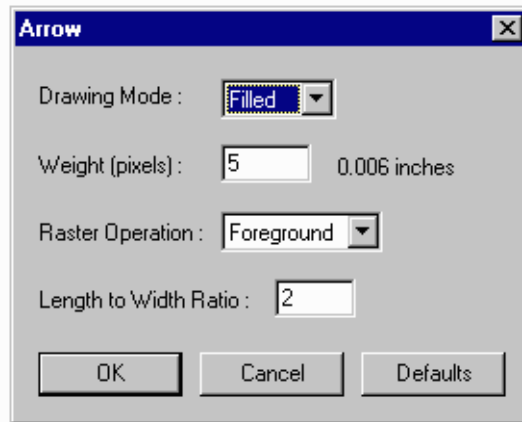


This is the cursor that appears when you are drawing an arc.

Draw Arrow



The Arrow function draws arrows.



1. To use Draw Arrow, select Draw-Arrow.
2. Select Filled or Outline mode. Filled mode creates filled arrows, while Outline mode creates arrow outlines using the current linestyle.
3. Select Weight. Weight specifies line width in pixels.
4. Select Raster Operation to specify drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch).
Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.
5. Select Length to Width Ratio. The Length to Width ratio specifies how narrow the arrow is. Higher ratios result in more narrow arrows. Press OK when ready.
6. Use the mouse to draw the arrow. Enter two points in the image to specify the arrow endpoints.

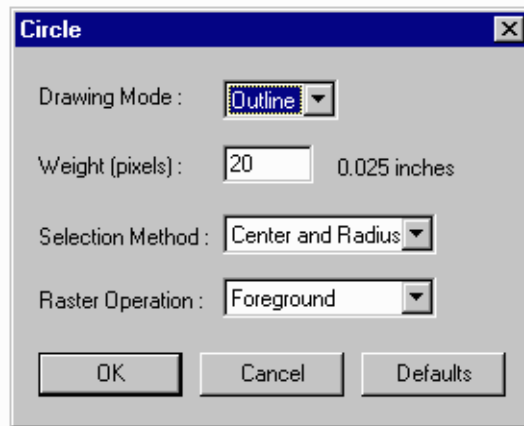


This is the cursor that appears when you are drawing an arrow.

Draw Circle



The Circle function draws circles.



1. To use Circle, select Draw-Circle.
2. Select Filled or Outline mode. Filled mode creates filled circles, while Outline mode creates circle outlines using the current linestyle.
3. Select Weight. Weight specifies line width in pixels.
4. Select the Selection Method. This option specifies Diameter Points, which selects circles with two outside points, or Center and Radius, which selects circles by a center point and an outside point.
5. Select the Raster Operation to specify drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). Press OK when ready. Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.
6. Use the mouse to draw the circle. Enter two points in the image to define the circle.

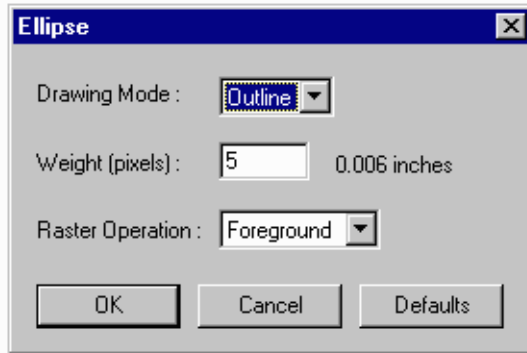


This is the cursor that appears when you are drawing a circle.

Draw Ellipse



The Ellipse function draws ellipses.



1. To use Ellipse, select Draw-Ellipse.
2. Select Filled or Outline mode. Filled mode creates filled circles, while Outline mode creates ellipse outlines using the current linestyle.
3. Select Weight. Weight specifies line width in pixels.
4. Select the Raster Operation. Raster Operation specifies drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). Press OK when ready.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.

5. Use the mouse to draw the ellipse. Enter two points in the image to specify the ellipse endpoints, and a third point to specify curvature.



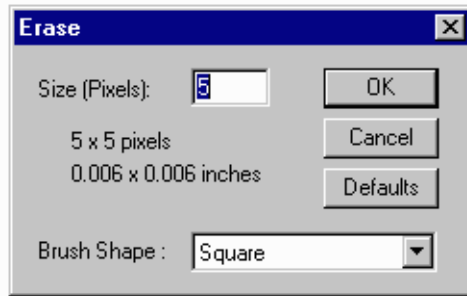
This is the cursor that appears when you are drawing an ellipse.

Draw Erase



The Erase function erases foreground pixels and replaces them with background pixels. The Size options specifies the size of the erase brush and Brush Shape specifies the type of brush.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Erase, select Draw-Erase.
2. Select the size of the erase area in pixels and the brush shape.
3. Position the cursor over the image. Hold down the left mouse button and move the mouse to erase.



This is the cursor that appears when you are erasing.

The following brush shapes are available:

- Square
- Round
- Flat Horizontal
- Flat Vertical
- Flat +45 Degrees
- Flat -45 Degrees

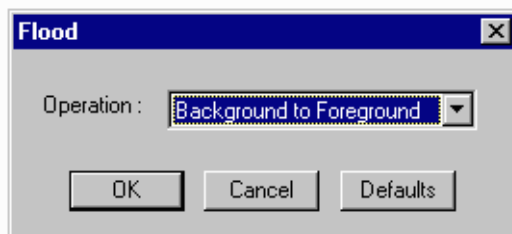
Draw Flood



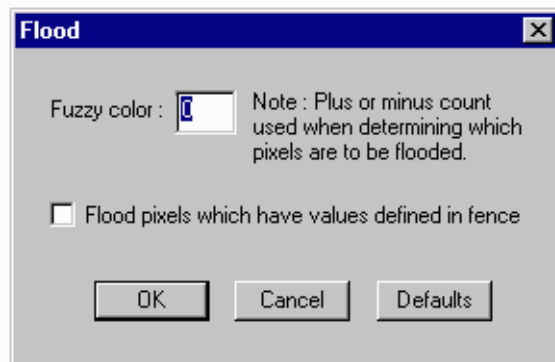
The Flood function floods a selected area.

Bi-level image flooding The Flood effect is contained by surrounding foreground pixels, if flooding a background area, or by the surrounding background pixels, if flooding a foreground area.

Color image flooding The Flood effect is contained by surrounding pixels of color other than the initial flood color and which are outside the range of fuzzy colors and/or colors defined in a fence.



Flood dialog for black and white (bi-level) images.



Flood dialog for color and grayscale images.

1. To use Flood, select Draw-Flood.
2. Select the Flood method (bi-level images) or the Fuzzy Color and Fence options (color and grayscale images). Click OK when ready.
3. Position the cursor over the image. Select a point to start the flood. All adjacent pixels of the same color are flooded. If Tracking is enabled, the selected region is previewed in the tracking color. You can abort the Flood region selection in progress or reject the Flood region selection by

pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)



This is the cursor that appears when you are flooding.

Bi-level Flood options:

Background to Foreground	Background to Foreground flooding replaces background pixels with foreground pixels.
Background to Xhatch	Background to Xhatch replaces a background area with the current Xhatch pattern. See Draw-Xhatch.
Foreground to Background	Foreground to Background flooding replaces foreground pixels with background pixels.
Foreground to Xhatch	Foreground to Xhatch replaces a foreground area with the current Xhatch pattern. See Draw-Xhatch.

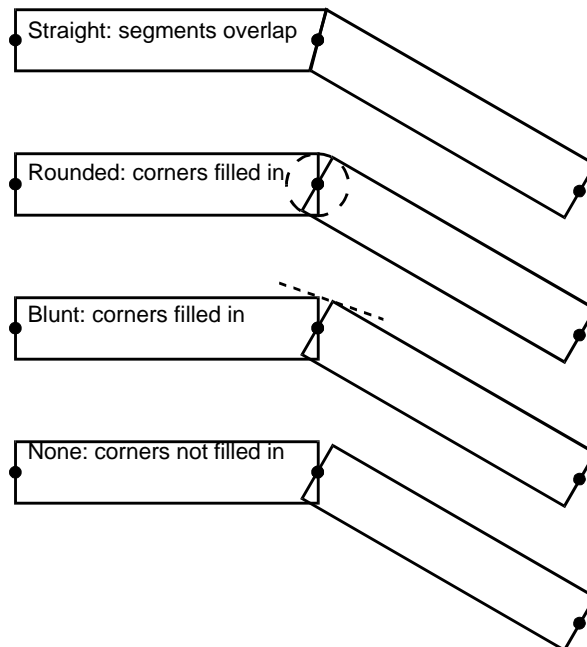
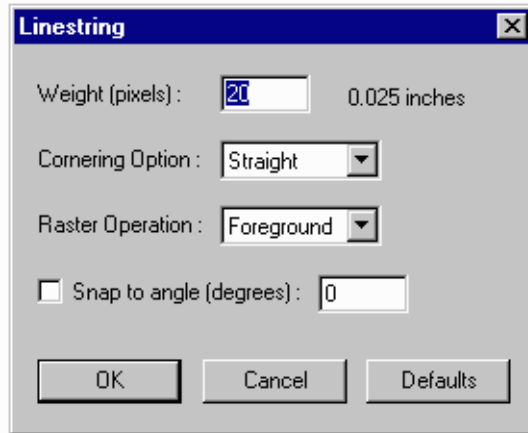
Color Flood options:

Fuzzy color	Flood a range of colors bounded in RGB color space by a cube that extends out from the initial flood color (the color of the pixel where you start the flood operation).
Flood pixels which have value defined in fence	Flood all contiguous pixels which are the color of any pixel within the current fence, and flood all contiguous pixels within the fuzzy range of the fenced pixels. See Datapoints-Place Fence.

Draw Linestring



The Linestring command draws lines in the current linestyle.



1. To use Draw Linestring, select Draw-Linestring or click on the Linestring icon in the toolbar.

2. Weight specifies line width in pixels. Select the cornering method, Straight, Rounded, Blunt, or None (see above) for vertices. Raster Operation specifies drawing in Foreground or Background , or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). A Snap to angle causes linestrings to snap to the nearest specified angle. Press OK when ready.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.

3. Use the mouse to draw the linestring. At least two points are required to define a single line segment. You can enter additional points to create complex linestrings. Click the right mouse button to terminate the linestring.



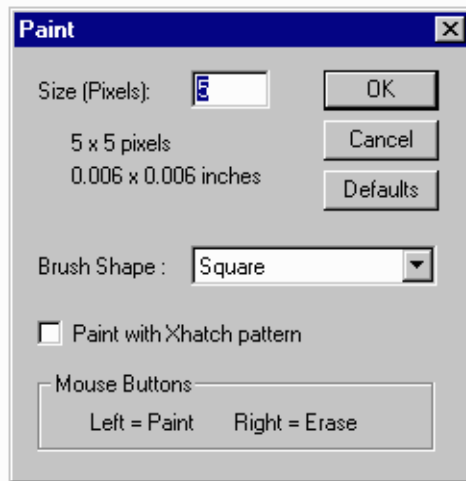
This is the cursor that appears when you are drawing a linestring.

Draw Paint



The Paint command draws pixels on screen in the foreground color using the mouse as a freehand drawing tool.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Paint, select Draw-Paint or click on the Paint icon in the toolbar.
2. Select the size of the paint area in pixels and the brush shape. If you wish create crosshatching, check *Paint with Xhatch pattern*. See Draw-Xhatch for details on crosshatch patterns.
3. Position the cursor over the image. Hold down the left mouse button and move the mouse to paint. (The right mouse button erases.)



This is the cursor that appears when you are painting.

The following brush shapes are available:

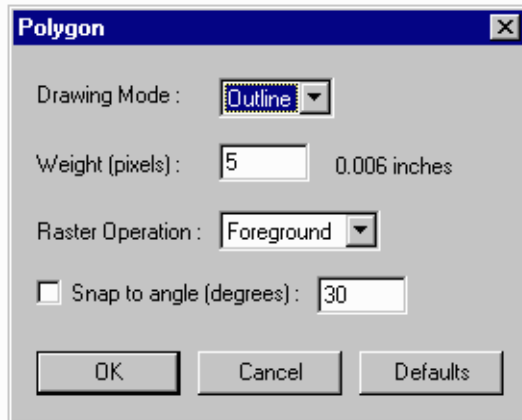
- Square
- Round
- Flat Horizontal
- Flat Vertical
- Flat +45 Degrees
- Flat -45 Degrees

Draw Polygon



The Polygon function draws polygons in the foreground color.

Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.



1. To use Draw Polygon, select Draw-Polygon.
2. Weight specifies line width in pixels. Filled mode creates filled polygons, while Outline mode creates polygon outlines using the current linestyle. Raster Operation specifies drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). A Snap to angle causes line segments in the polygon to snap to the nearest specified angle. Press OK when ready.
Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.
3. Use the mouse to draw the polygon. At least three points are required to define a polygon. You can enter additional points to create more complex polygons. A right mouse click closes the polygon automatically.

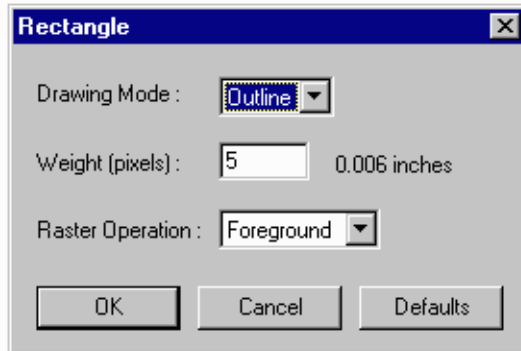


This is the cursor that appears when you are drawing a polygon.

Draw Rectangle



The Rectangle function draws rectangles.



1. To use Draw Rectangle, select Draw-Rectangle.
2. Weight specifies line width in pixels. Filled mode creates filled rectangles, while Outline mode creates rectangle outlines using the current linestyle. Raster Operation specifies drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). Press OK when ready. Use the Image-Colors command to define the background and foreground colors for color or grayscale image files.
3. Use the mouse to enter two points that define the rectangle.

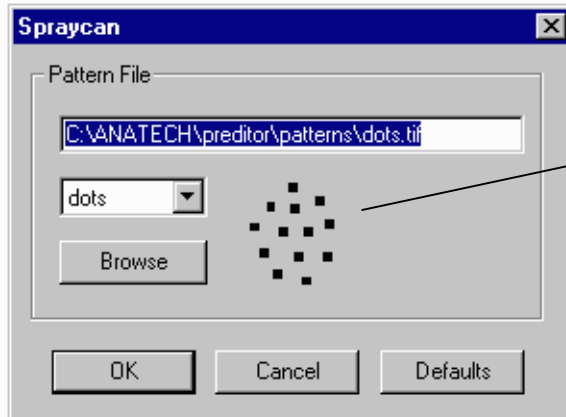


This is the cursor that appears when you are drawing a rectangle.

Draw Spraycan



The Spraycan function stamps a selected raster pattern in the drawing area while the mouse is moved.



Click on pattern to scroll through list of available patterns. Left click scrolls forward; right click scrolls backward.

1. To use Spraycan, select Draw-Spraycan.
2. Select a pattern file to use for the spraycan operation. See the Draw-Xhatch section for an illustration of patterns. You can enter the pattern file name, or select a pattern name from the pattern menu in the Spraycan dialog, or you can right-click or left-click the mouse on the pattern icon in the dialog to scroll through the available patterns. Also, you can use the Browse button to manually select a pattern file.
3. Position the cursor over the image. Hold down the left mouse button and move the mouse to “spray” the pattern on the image in the current foreground color.



This is the cursor that appears when you are using Spraycan.

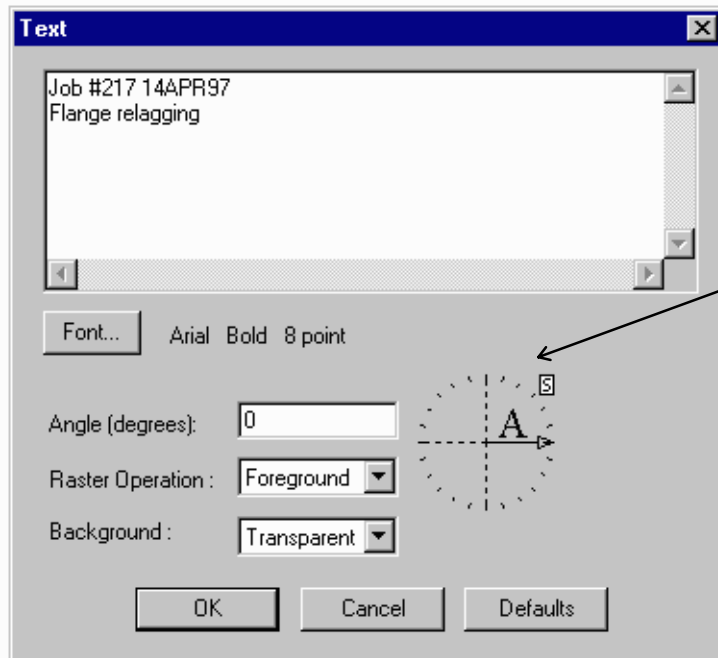
Note that you can easily design your own patterns to use with Spraycan or Xhatch. Create a bi-level image and draw the design you want to use. Save or crop this image into a pattern file in one of the bi-level formats used for patterns: TIF, CALS, RLC, RLE, CIT, TG4, or LRD. To use the pattern, select it using the Browse button in the Spraycan dialog.

Draw Text



The Text command draws text in the image in a selected Windows font. You can draw text in any font available to Windows (including TrueType fonts).

You can turn off Windows fonts in File–Preferences–Text and use built in fonts. Refer to File–Preferences–Text and to Appendix C, Non-Windows Fonts for further information on non-Windows fonts.



Drag the interactive tool to set the Text angle. Click on "S" to set the snap angle.

1. To use Text, select Draw-Text, or click on the Text icon in the toolbar.

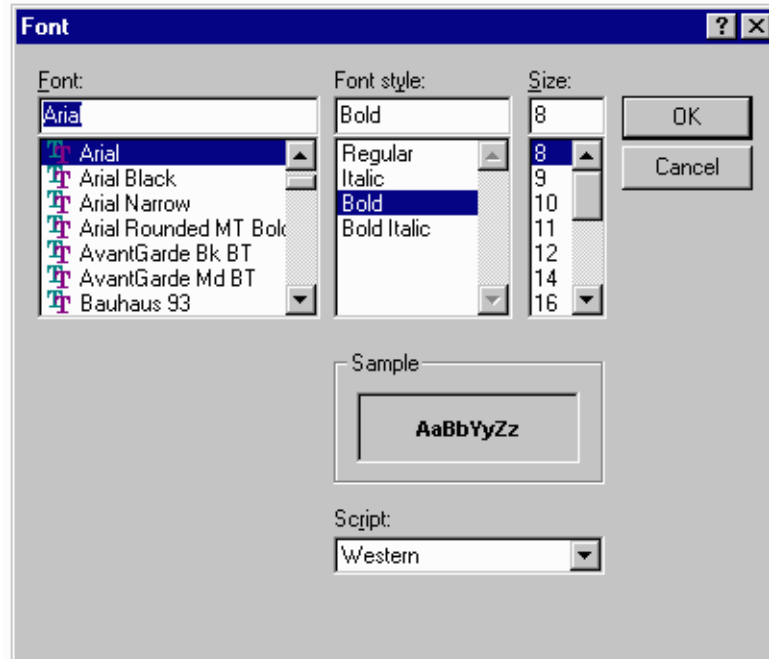


2. Position the cursor over the image and select a datapoint where you want the text to start. The datapoint specifies the lower left corner for the text. The following cursor appears when you select the datapoint to start the text:

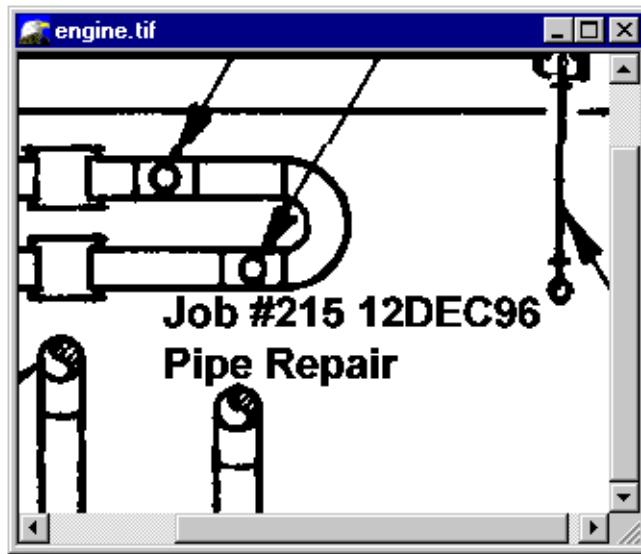


3. Complete the Text dialog as needed. Enter the text in the text field, as shown above.

4. The angle specifies the angle at which to place the text in the image. You can use the interactive angle tool to set the angle or enter the angle manually. The Snap dialog lets you control the increment of the angle tool. Raster Operation specifies drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). (The Image-Colors command defines the background and foreground colors for color or grayscale image files.) The Opaque method erases the pixels underneath the text. The Transparent method does not alter the pixels underneath the text.
5. Press Font to select a Windows font.



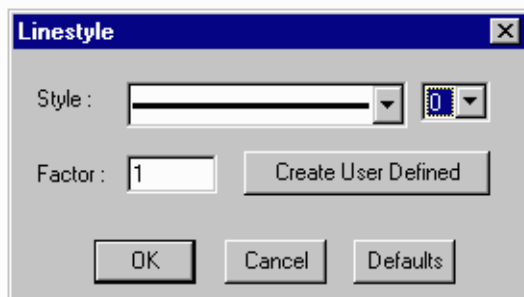
6. When ready, press OK. The text appears in the image.



Draw Linestyle



The Linestyle option selects the type of linestyle to use whenever you draw lines or when Outline mode is used to draw objects, including: arc, arrow, circle, ellipse, linestring, polygon, and rectangle. Type 0 is a solid line, while other linestyle types are dashed lines. The Factor setting elongates the line.



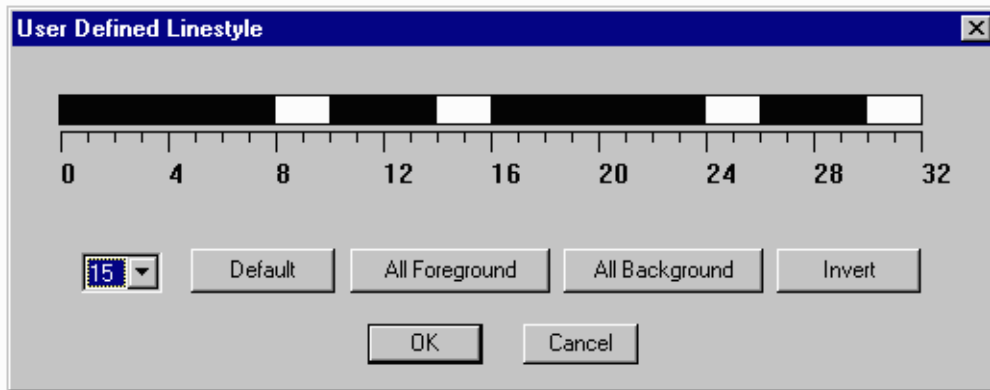
1. To use Linestyle, select one of the available styles.
2. You can enter a factor to stretch or squeeze the linestyle pattern. Factors greater than 1 stretch out the pattern.

Linestyles

Type 0	
Type 1	
Type 2	
Type 3	
Type 4	
Type 5	
Type 6	
Type 7	

User Defined Linestyles

You can create your own linestyles in the User Defined Linestyle dialog. Linestyles 8-15 may be customized.



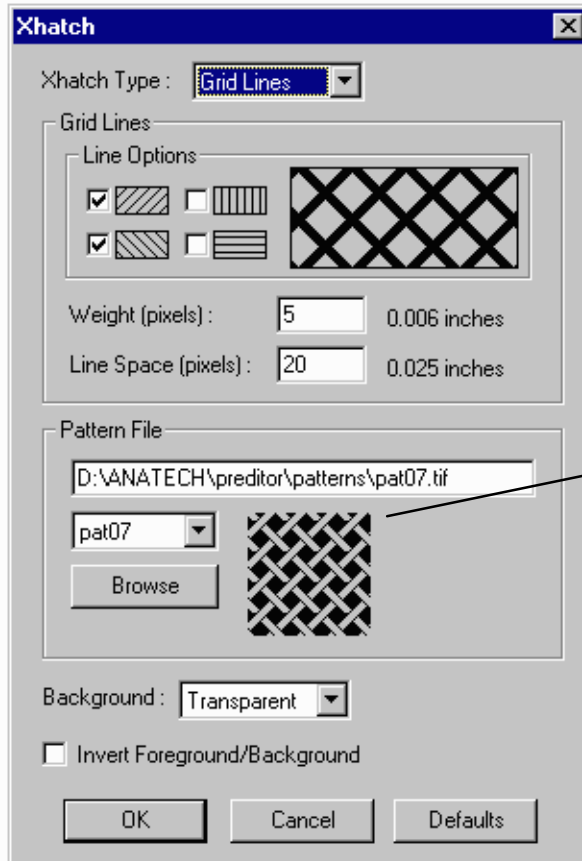
1. To make your own linestyle, click on the Create User Defined button in the Linestyle dialog to bring up the User Defined Linestyle dialog.
2. Select a line pattern from 8-15 to be customized. The default line patterns are the same as the built-in line patterns for linestyles 0-7.
3. To modify the linestyle, click on different parts of the line segment in the dialog. Clicking on each part of the line switches it from black to white, or from white to black.
4. Other controls include All Foreground, which makes the line all black, or All Background, which makes it all white. Invert reverses the currently displayed pattern.
5. When you are satisfied with the new linestyle, press OK.

Note that saving your PREDITOR workspace (see File-Preferences-Save Workspace) preserves your linestyle customization. Pressing Default in the User Defined Linestyle dialog returns the selected linestyle to its original appearance.

Draw Xhatch



The Xhatch option selects a crosshatch pattern to use whenever drawing operations are performed in Xhatch mode.



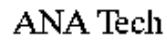
Click on pattern to scroll through list of available patterns. Left click scrolls forward; right click scrolls backward.

1. To use Xhatch, select Draw-Xhatch.
2. Complete the Xhatch dialog, as needed. You can select Grid Lines or Pattern File mode. Grid Lines draws horizontal, vertical, and/or diagonal lines with the weight and spacing you select. Pattern File fills the area with a pattern selected from one of the pattern files in the patterns directory (see below). You can select the pattern file by name or click on the pattern to select it.
3. The Opaque method replaces all pixels. The Transparent method replaces only foreground pixels. If Invert Foreground/Background is enabled, white and black in the pattern are reversed when the crosshatch pattern is applied. Press OK when ready.

Patterns

The table below shows available patterns.

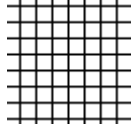
anatech.tif



pat05.tif



pat14.tif



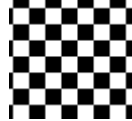
pat23.tif



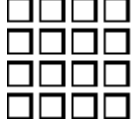
circle.tif



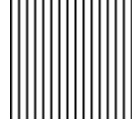
pat06.tif



pat15.tif



pat24.tif



dots.tif



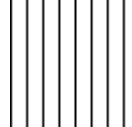
pat07.tif



pat16.tif



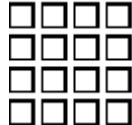
pat25.tif



happface.tif



pat08.tif



pat17.tif



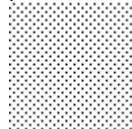
pat26.tif



pat00.tif



pat09.tif



pat18.tif



pat27.tif



pat01.tif



pat10.tif



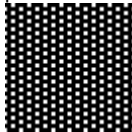
pat19.tif



pat28.tif



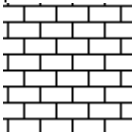
pat02.tif



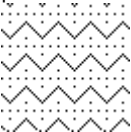
pat11.tif



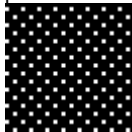
pat20.tif



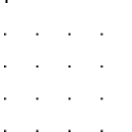
pat29.tif



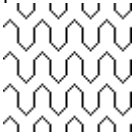
pat03.tif



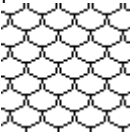
pat12.tif



pat21.tif



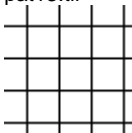
pat30.tif



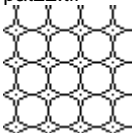
pat04.tif



pat13.tif



pat22.tif



pat31.tif



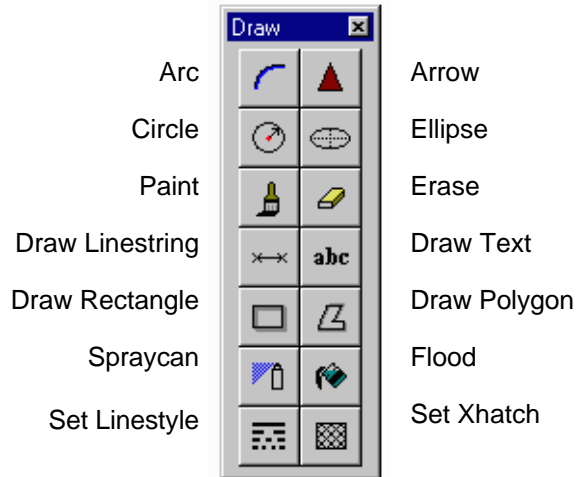
Draw Dialogs

Check the Dialogs menu item to enable display of Draw menu dialogs. When the Dialogs menu item is unchecked, Draw menu functions are started immediately without displaying the dialog, using current settings. The Dialogs item is checked by default when PREDITOR starts. If you don't need to see the dialogs, it may save time to uncheck the Dialogs menu item.

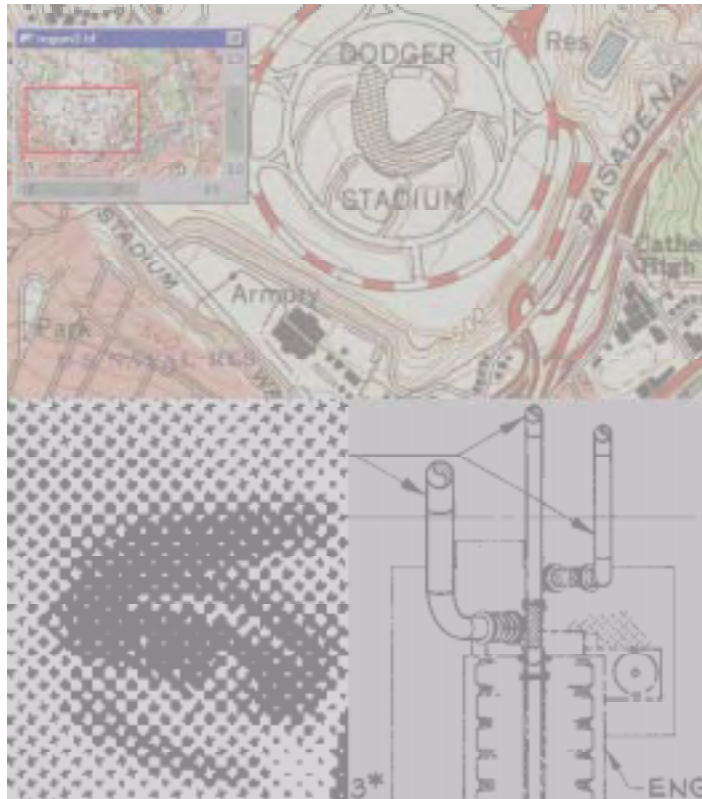
Draw Toolbar

Checking the Toolbar selection displays the Draw menu icon palette. You can drag the icon palette around the Windows desktop. Drag on the corner of the toolbar to change its row/column layout, as needed.

Clicking the *left mouse button* on the icons in the icon palette executes the corresponding command in the Draw menu. Clicking the *right mouse button* on the icons in the icon palette brings up the dialog for that command.



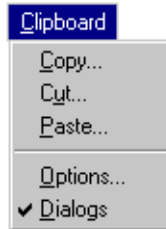
CLIPBOARD MENU



SCANSMITH PREDITOR

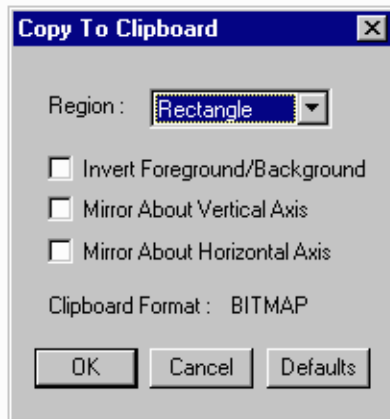
6. Clipboard Menu

This section provides information about the PREDITOR Clipboard menu:



Clipboard Copy

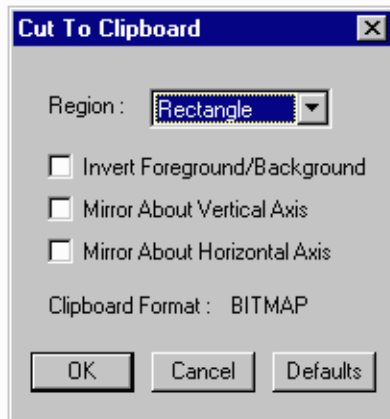
The Copy command executes Windows clipboard copy operations. Note that you can copy, cut, and paste to and from different PREDITOR images in different formats (color, grayscale, and bi-level) or to and from external Windows applications.



1. To use Clipboard Copy, select Clipboard-Copy.
2. Select a region for the Copy operation. You can select rectangle, polygon, or the entire image for bi-level, grayscale, or color files. Raster item mode is available for bi-level files.
3. Select Invert and Mirror options. The Invert option inverts data as it is copied to the clipboard. The Mirror options mirror the data as it is copied to the clipboard. When ready, press OK.
4. If Entire Image is specified, the copy operation occurs immediately. If a region or raster item is specified, use the mouse to select the region or raster item. When selecting raster items, if File-Preferences-Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the Copy region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)
5. The selected data is now available in the Windows clipboard.

Clipboard Cut

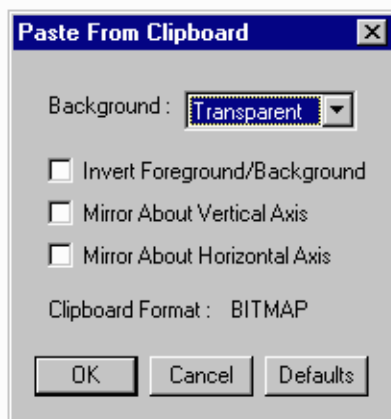
The Cut command executes Windows clipboard cut operations. Note that you can copy, cut, and paste to and from different PREDITOR images in different formats (color, grayscale, and bi-level) or to and from external Windows applications.



1. To use Clipboard Cut, select Clipboard-Cut.
2. Select a region for the Copy operation. You can select rectangle, polygon, or raster item mode.
3. Select Invert and Mirror options. The Invert option inverts data as it is cut to the clipboard. The Mirror options mirror the data as it is cut to the clipboard. When ready, press OK.
4. Use the mouse to select the region or raster item. When selecting raster items, if File-Preferences-Tracking is enabled, the selected region is previewed in the tracking color. You can abort the raster item selection in progress or reject the Cut region selection by pressing the right mouse button or the Escape key. (See File-Preferences-Bi-level Files.)
5. The selected data is now available in the Windows clipboard.

Clipboard Paste

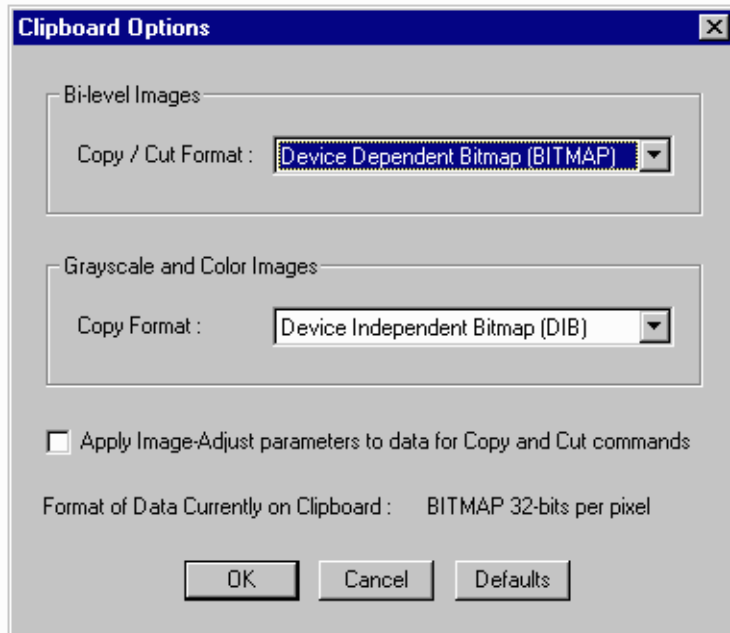
The Paste command executes Windows clipboard paste operations. Note that you can copy, cut, and paste to and from different PREDITOR images in different formats (color, grayscale, and bi-level) or to and from external Windows applications.



1. To use Clipboard Paste, select Clipboard-Paste.
2. Select the Background mode for the paste operation. The Opaque method replaces all pixels at the paste destination with pixels from the clipboard data. The Transparent method replaces only foreground pixels.
3. Select Invert and Mirror options. The Invert option inverts data as it is pasted from the clipboard. The Mirror options mirror the data as it is pasted from the clipboard. When ready, press OK.
4. Use the mouse to select a datapoint to specify the lower left corner of the paste operation.

Clipboard Options

The Options dialog lets you select the Windows clipboard format for copy and cut operations. The default settings for these options are set to the appropriate settings for your operating system (i.e., Windows® 3.1, Windows® 95, or Windows NT™). It should not be necessary to change these options, however, these settings are available should you wish to try alternate modes of clipboard operation.

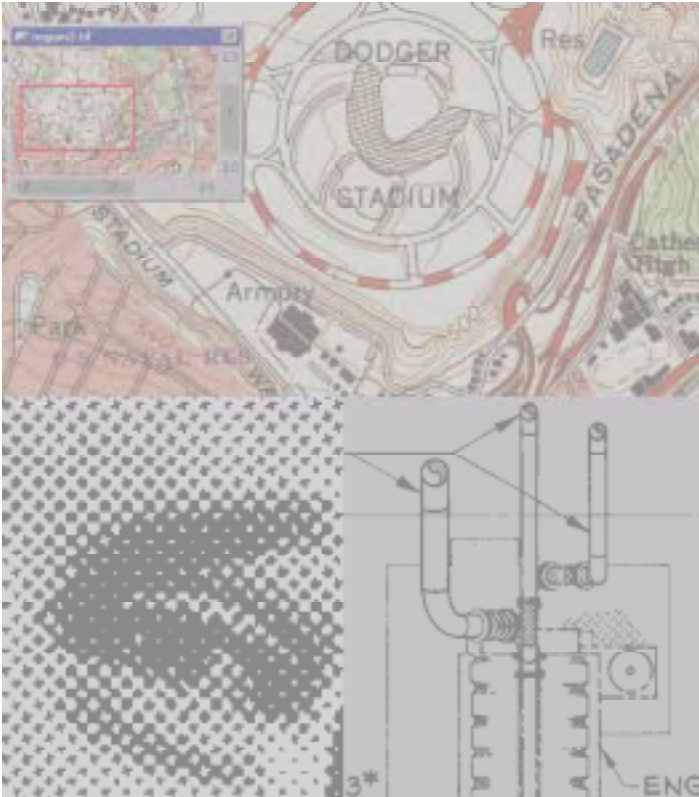


Enabling the option *Apply Image-Adjust parameters to data for Copy and Cut commands* causes PREDITOR to modify grayscale or 24-bit color data using the current Image-Adjust settings when it is placed in the clipboard. Use this if you want to retain Image-Adjust settings and you intend to export the data into some other application.

Dialogs

Check the Dialogs menu item to enable display of Clipboard menu dialogs. When the Dialogs menu item is unchecked, Clipboard menu functions are started immediately without displaying the dialog, using current settings. The Dialogs item is checked by default when PREDITOR starts. If you don't need to see the dialogs, it may save time to uncheck the Dialogs menu item.

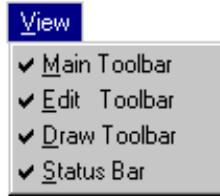
VIEW MENU



SCANSMITH PREDITOR

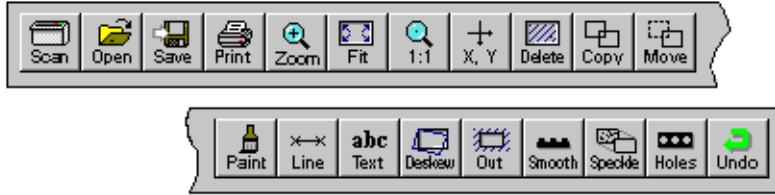
7. View Menu

This section provides information about the PREDITOR View menu.



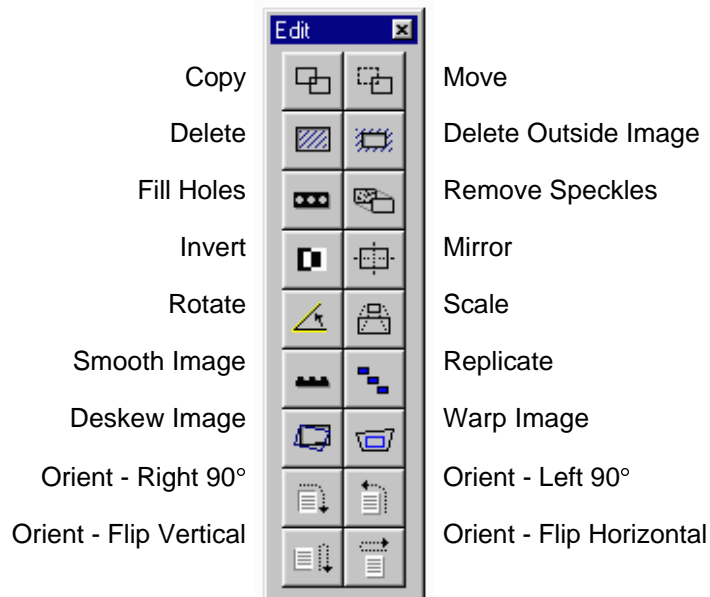
View Main Toolbar

Enables/disables the display of the Main toolbar, which appears at the top of the PREDITOR dialog.



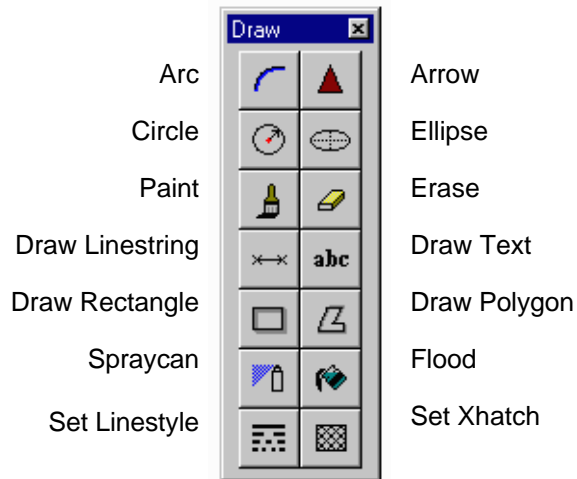
View Edit Toolbar

Enables/disables the display of the Edit toolbar. The Edit toolbar is an icon palette that can be moved and resized. Clicking the *left mouse button* on the icons in the icon palette executes the corresponding command in the Edit menu. Clicking the *right mouse button* on the icons in the icon palette brings up the dialog for that command.



View Draw Toolbar

Enables/disables the display of the Draw toolbar. The Draw toolbar is an icon palette that can be moved and resized. Clicking the *left mouse button* on the icons in the icon palette executes the corresponding command in the Draw menu. Clicking the *right mouse button* on the icons in the icon palette brings up the dialog for that command.



View Status Bar

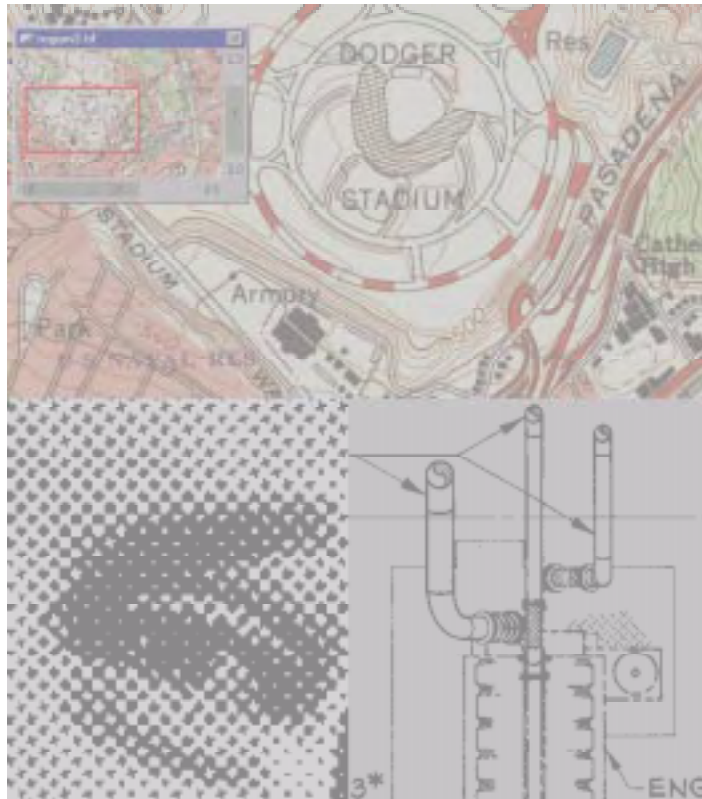
Enables/disables the display of the View status bar. The status bar prompts you for input, and also displays the current mouse location and associated information. For example, the following information is displayed in the status bar when using the Image-Measure command:

`xy = (5.510, 1.159) distance = 17.602 angle = -62.64`

**X, Y Location Total Distance Angle of Measure
Linestring**

The X,Y location, total distance, and angle of the measure linestring are displayed in inches, centimeters, or pixels. See File-Preferences-Units.

IMAGE MENU



SCANSMITH PREDITOR

8. Image Menu

This section provides information about the PREDITOR Image menu. Image commands such as Zoom, 1:1, Fit, and so on, can be used to display different parts of an image in a raster view.

Image Menu for black and white images.

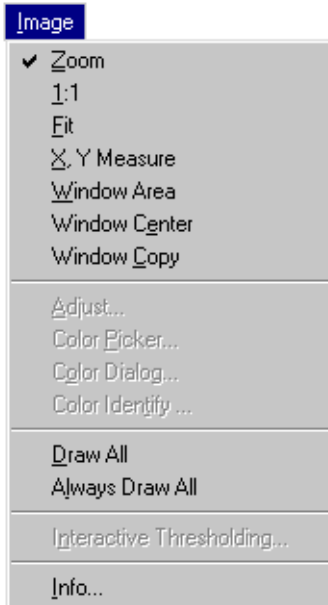


Image Menu for grayscale images.

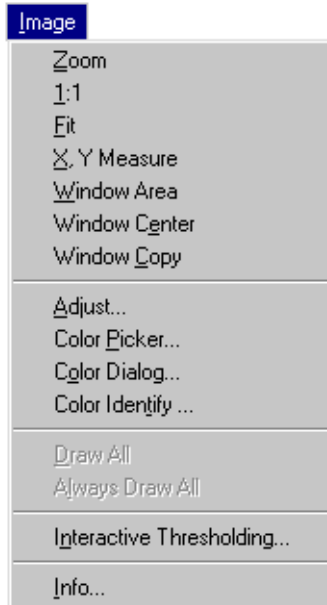
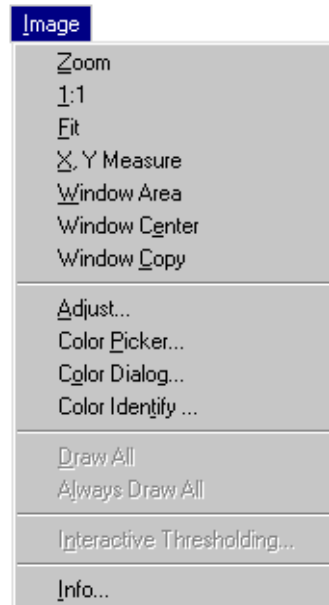


Image Menu for color images.



Zoom, Measure, and Window Controls

The Zoom, 1:1, Fit, Measure, and Window controls for the image menu appear in a group in the upper portion of the menu. These controls perform image manipulation functions that control the display of the image, but they do not affect the raster data itself.

Command Interrupt

PREDITOR lets you interrupt editing and drawing actions with zooming and view actions, then resume your editing or drawing operation in progress. This differs from the behavior of typical Windows-based image editing programs. In most programs, when you interrupt your drawing action with some other action such as zooming, you must then restart the drawing action from the beginning. PREDITOR lets you interrupt drawing and editing commands with image control commands, so you can zoom, for instance, or center the image, before continuing your drawing or editing action. The interrupt works like this:

1. If you are currently performing a draw operation, such as Arc, Circle, and so on, and you find you need to reposition the image, go to the toolbar and use the necessary zoom or view control. For instance, you might want to zoom in on a particular region.
2. After performing the image operation, press the Escape (ESC) key. You now return to your previous operation, in progress.

Image Zoom

The Zoom function provides a zoom tool. Left-clicking zooms in. Right clicking zooms out. The image is centered about the spot where you click the magnifying glass.



This is the cursor that appears when the zoom tool is active.

Image 1:1

The 1:1 command displays raster data with a ratio of one screen pixel to one data pixel. The display is centered around the point where you click the magnifying glass icon in the image.



This is the cursor that appears when the 1:1 tool is active.

Image Fit

The Fit command zooms out to display the entire image.



This is the cursor that appears when the Fit tool is active.

Image X, Y Measure

The X,Y Measure command brings up a measuring tool. Click the tool in the image and then move the mouse. Clicking the left mouse button places intermediate measure points. Interactive linestrings display to show the measured distance. Observe the display in the status bar to see current position and total distance from the first mouse click. The status bar also displays the angle of the linestring, in degrees. Right click starts a new measure operation. Note that you can zoom in and out to measure across a large raster image.

You can set a scaling factor that is applied to the x/y coordinates and the total distance measured. The scaling factor is specified in File-Preferences-Units.


 This is the cursor that appears when the X, Y Measure tool is active.

Image Window Area

The Window Area command zooms the image window about a selected area. You select the area by using the mouse to select two points to define a rectangle. Then select the image window for the zoom operation (any image window of the file).


 This is the cursor that appears when the Window Area tool is active.

Image Window Center

The Window Center command centers the image in the selected destination window about a selected datapoint in the image.


 This is the cursor that appears when the Window Center tool is active.

Image Window Copy

The Window Copy command copies the image displayed in one window to another window, so that the image has the same relative placement and zoom factor.


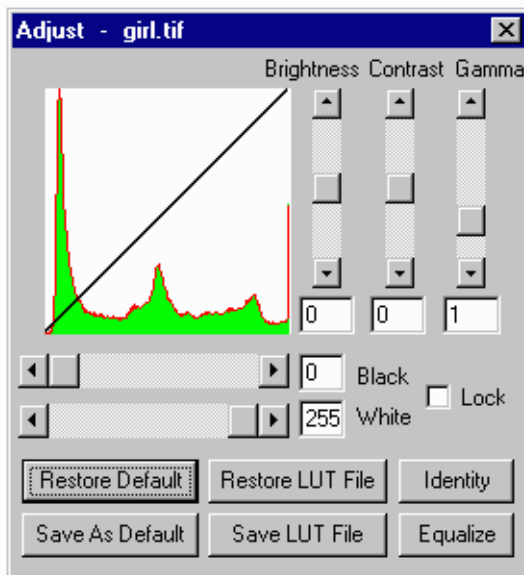
 This is the cursor that appears when the Window Copy tool is active.

Image Adjust

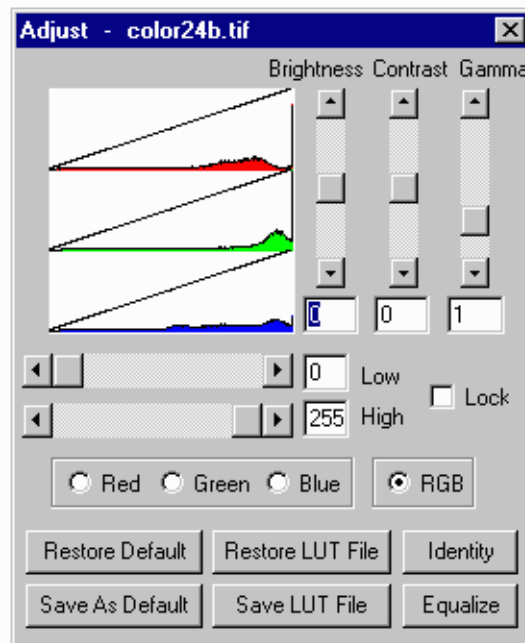


The Adjust dialog provides color or gray level control for color and grayscale images. The dialog includes a histogram that shows the original and adjusted distribution of pixels on a scale of 0-255. Color histograms have three channels for red, green, and blue, whereas grayscale histograms display only the single grayscale channel.

- For grayscale data, adjustments affect the brightness, contrast, gamma, and black/white limits for pixel values.
- For 24-bit color data, adjustments affect the red, green, and blue data channels. Brightness, contrast, gamma adjustments can be applied to all channels of the data by selecting RGB, or to the individual red, green, or blue channels.
- For 8-bit or 4-bit color data, adjustments affect the color palette only. Brightness, contrast, gamma adjustments can be applied to all channels of the color palette by selecting RGB, or to the individual red, green, or blue channels of the color palette.



Grayscale Image Adjust Dialog



Color Image Adjust Dialog

1. To use Image-Adjust, select Image-Adjust. This menu selection is available only for color and grayscale images.
2. Refer to the table and illustrations that follow for Adjust dialog settings.
3. Double-click on the upper left corner of the Adjust dialog to close the dialog when Adjust operations are complete.

Tips on Using Image Adjust

Setting default image appearance in PREDITOR. Press Save As Default if you want to save Image-Adjust settings as a default so that future PREDITOR sessions will use the same adjustments to display other color and grayscale images.

Using Image Adjust LUTs with SCANSMITH SCAN or SCAN-C. You can save an image adjust lookup table (LUT) file for use with SCANSMITH SCAN so that the color or grayscale data itself is adjusted during the scan.

Using Image Adjust LUTs with File-Convert. You can save an image adjust lookup table (LUT) file for use during the File-Convert operations.

Isolating color channels. You can set up PREDITOR to display only one of the red, green, or blue channels. For example, to display only the red channel, select the green channel and set both Low and High to zero, then select the blue channel and set both Low and High to zero. Only the red channel is displayed.

Extracting a single channel of grayscale from 24-bit color data. Set up PREDITOR to display only one color channel (see above), then use Save LUT File to save the current LUT. Then, use File-Convert to convert the 24-bit file into a grayscale file using this image adjust LUT file.

Note LUTs generated with image adjust are not the same type of files as LUTs generated by SCANSMITH CLASS for color classification purposes; color classification LUTs are not interchangeable with image adjust LUTs.

Image-Adjust settings do affect halftoning and plotting of images with File-Halftone and File-Print.

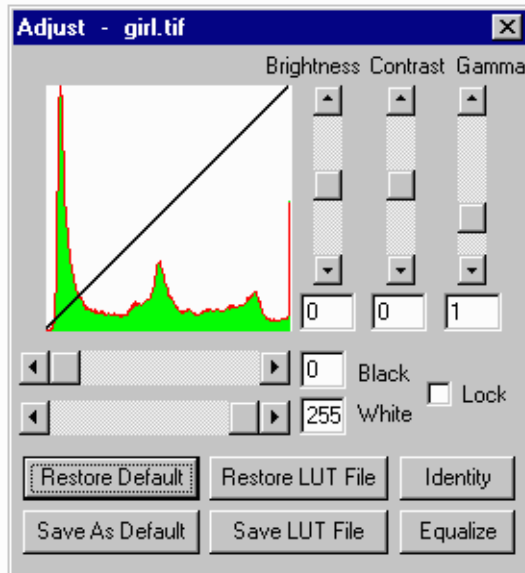
The Image Adjust Dialog

Red/Green/ Blue/RGB	RGB lets you adjust all color channels simultaneously. Or you can adjust color channels separately.
Brightness	The Brightness slider adjusts from -255 to +255. 0 has no effect. Values above 0 make the image brighter and values below 0 make the image darker. The brightness adjustment is accomplished by shifting all original values by an equal amount up or down.
Contrast	The Contrast slider adjusts from -100 to +100. 0 has no effect. Values greater than 0 result in greater image contrast, while values less than 0 result in less image contrast. The contrast adjustment is accomplished by stretching or squeezing all original values on the 0-255 scale. Thus, reducing contrast "squeezes" all original values into a smaller range of displayed values, while increasing contrast "stretches" all original values into a greater range (output values less than 0 are output as 0 -- black, and output values greater than 255 are output as 255 -- white).
Gamma	The Gamma slider adjusts from 0.1 to 5. 1 has no effect. Values greater than 1 brighten midtones and values less than 1 darken midtones. <i>A gamma setting of 2 works well for most grayscale applications.</i> The gamma adjustment is accomplished by transforming input values to output values based on a curve (this curve is displayed in the Image Adjust histogram). This curve does not affect white or black but does change the mid tones, making values lighter or darker, depending on the gamma setting.
Black/White	For grayscale images, the Black/White settings set the upper and lower limits for all-black and all-white data. For example, if Black is set to 50 and White is set to 200, then all regions of the image with grayscale levels of 50 or darker are output as a shadow area of solid black (grayscale value=0) and all regions with grayscale levels of 200 or lighter are output as a highlight area of solid white. Note that if the black slider is set to a value higher than the white slider, a negative image results.

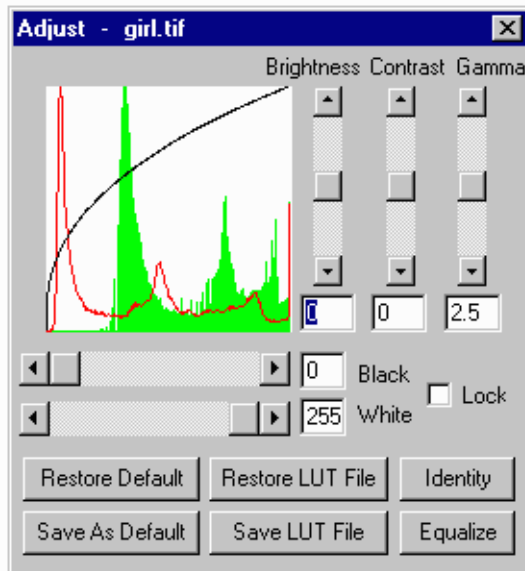
Low/High	<p>For color images, the Low/High settings set the upper and lower limits for 0 saturation (the absence of the color channel) and full saturation. For example, if Red channel Low is set to 50 and High is set to 200, then all regions of the image with red levels of 50 or darker are output with no red component and all regions with red levels of 200 or lighter are output with the red component set to the maximum of 255. As with grayscale images, making the Low slider higher than the High slider results in a negative image for that color channel.</p> <p>Low/High settings for individual color channels override the Low/High settings for all three channels when RGB is selected. If Low/High settings are set to 0/255 for an individual color channels, that channel uses the Low/High setting specified in RGB mode.</p>
Lock	<p>The Lock setting locks the Black/White or Low/High sliders so that both move in unison when one or the other is moved.</p>
Save As / Restore Default	<p>These selections let you save the image adjustments as a default or load the current default. When Image-Adjust settings are saved as a default, future sessions of PREDITOR use these settings to display 24-bit color or grayscale images. (You can return to a non-adjusted display by selecting Identity, then Save As Default.) For color files, the Save As / Restore Default function only affects the selected channel(s).</p>
Save / Restore LUT File	<p>These selections can be used to load a LUT from disk or to save a LUT. You can specify a LUT generated by PREDITOR in SCANSMITH SCAN to modify scanned data at scan time. Note that if data is scanned with a LUT, the adjustments are in the original data, whereas image adjustments subsequently applied while viewing images in PREDITOR do not affect the data itself, only the display of data.</p> <p>When saving the LUT, you can specify the number of output color or grayscale levels between 2-256. This setting should not be changed unless you want to remap colors or graylevels when loading the LUT.</p>

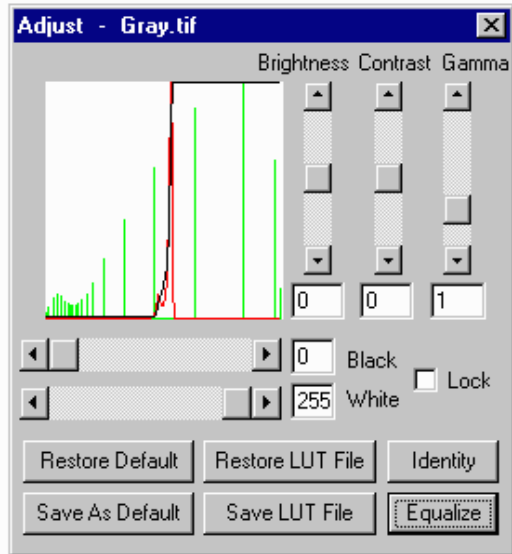
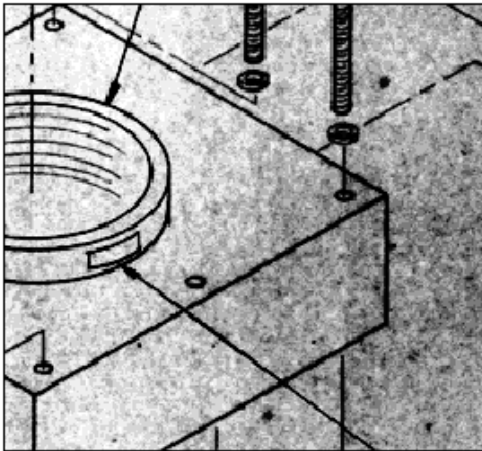
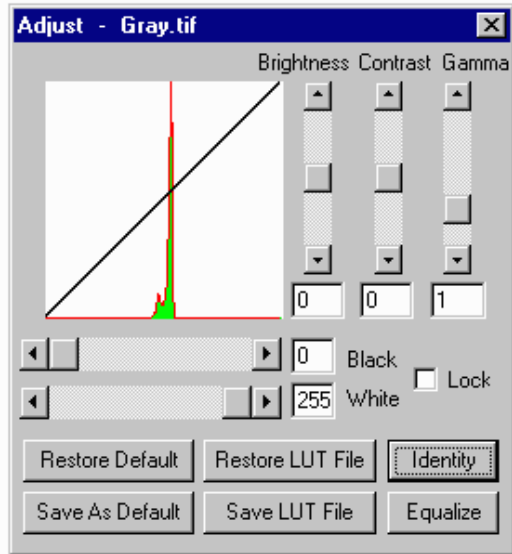
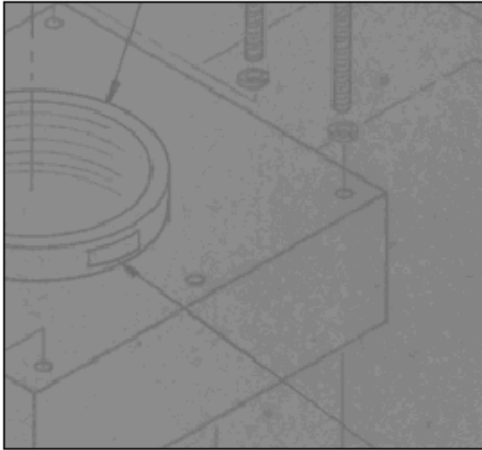
- Identity** The Identity command resets all image adjustments so that the original values are displayed without modification. For color files, the Identity function only affects the selected channel(s).
- Note that for 8-bit and 4-bit color image files, the Identity command resets image adjustments for the currently active Adjust dialog only. To restore the color palette after making changes, select Image–Colors to bring up the Image Colors dialog, then press the *Original Palette* button.
- Equalize** The Equalize command redistributes the intensity levels in the image so that equal weight in the histogram is given to different intensity levels. For images that have low contrast, in which most data is represented by a small intensity range, the Equalize function may enhance image features by using more intensity levels to represent the bulk of image data. The redistribution assigns all image pixels of each reassigned intensity level to some other intensity level. The Equalize function tends to flatten the histogram curve. For color files, the Equalize function only affects the selected channel(s).

The Image Adjust dialog. A histogram shows the original data (outline) and the adjusted data (region inside outline).



Using the dialog to make adjustments. The black graph line shows the relationship between original (horizontal axis) and output (vertical axis) values.





Grayscale image, before and after Equalize

The equalize feature normalizes distribution of pixels. When data is concentrated within a small range of values, Equalize may improve the image's appearance. You can use the Equalize feature for grayscale or color data. If RGB is selected, the Equalize operation is applied to all color channels. If Red, or Green, or Blue are selected individually, Equalize is applied to that channel only.

Adjust the image or the data?

It is important to know whether you want to adjust scan data at scan time, or merely adjust the image at display time. To adjust the scanned data at scan time, use PREDITOR to create a LUT. Display some data typical of the documents you want to scan. Use Image-Adjust to get the right appearance. Select Save LUT File and save the lookup table (LUT). Then, when you run SCANSMITH SCAN to scan future documents, specify this LUT in SCAN. The data will then be adjusted at scan time. *If you use a LUT to modify the data at scan time, do not use Image-Adjust settings to also modify the data in PREDITOR when displaying this scanned data. Instead, avoid PREDITOR image adjustments by selecting the Identity function in the Image-Adjust dialog.*

Alternatively, you can save the LUT, not using it to scan, but rather loading the LUT in PREDITOR to display other images. Or you can use Save As Default to change PREDITOR's default image adjustment display.

You might not always want to adjust the data at scan time. Data adjusted at scan time is permanently adjusted. For instance, contrast stretching and squeezing may affect the amount of useful information contained in such a scanned file. You may wish to scan without a LUT and capture unadjusted data to avoid potential loss of information in the data. This may give you greater flexibility to later use image adjustment features in applications such as PREDITOR to change the way the image is displayed. Your own workflow should determine whether it is best to use a LUT during scanning, or not.

Image Color Picker



The Color Picker selection brings up the color picker tool. The color picker lets you quickly select a foreground and a background color for 24-bit RGB color data, 8-bit palette color data, and grayscale data. The foreground color is used for many drawing operations. The background color is used in operations such as Delete and Move. Operations that involve drawing using the crosshatch pattern use both foreground and background colors to form the crosshatch pattern.

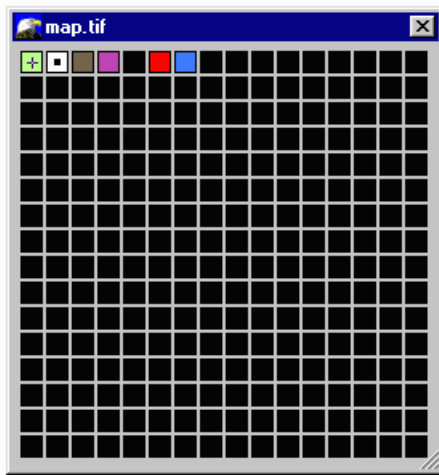
Color Picker used with 24 bit color file



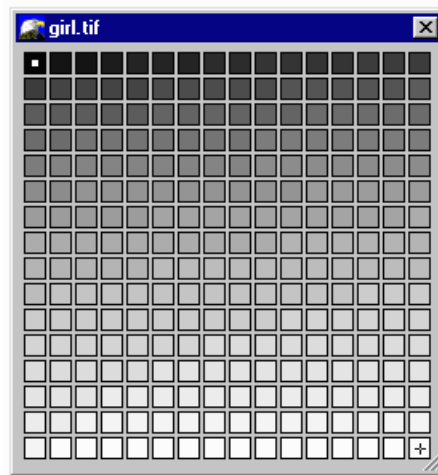
The solid dot shows the current foreground color. Use the LEFT mouse button to select a new foreground color.

The plus sign “+” shows current background color. Use the RIGHT mouse button to select a new background color.

Color Picker used with 8 bit palette color file



Color Picker used with grayscale file



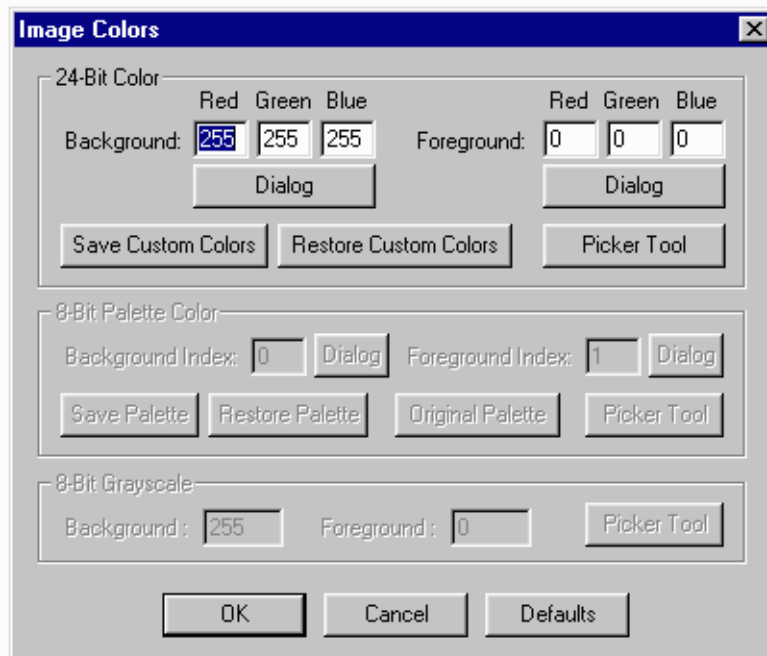
The colors initially use the default Windows 16-color palette, however you can redefine individual color selections or reset the palette, as described in the table below.

Left mouse button	Selects foreground color.
Right mouse button	Selects background color.
Left mouse on already-selected foreground color	Bring up interactive color selection dialog to redefine the foreground color.
Right mouse on already-selected background color	Bring up interactive color selection dialog to redefine the background color.
CTRL + left mouse button on any color	Bring up interactive color selection dialog to redefine the color.
SHIFT + left mouse button anywhere in the color picker dialog	For 24-bit RGB images, this resets color selections in the color picker dialog to the default Windows 16 color palette.

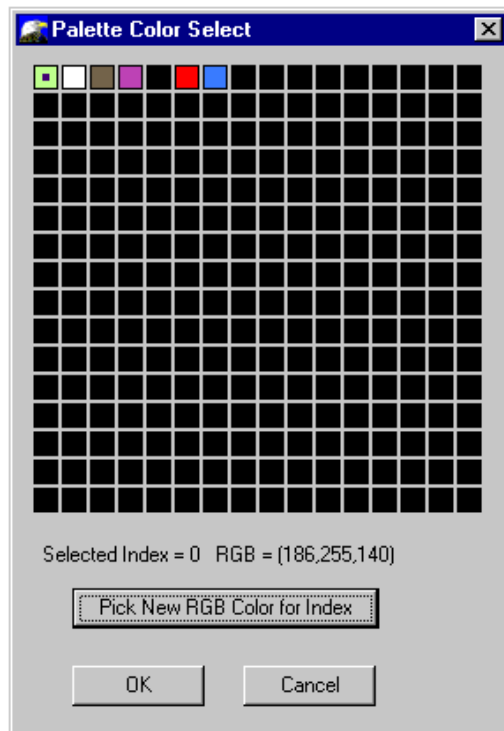
Image Color Dialog

The Image Color dialog lets you define the background and foreground colors for 24-bit RGB color data, 8-bit palette color data (and redline files), and grayscale data. The foreground color is used for many drawing operations. The background color is used in operations such as Delete and Move. Operations that involve drawing using the crosshatch pattern use both foreground and background colors to form the crosshatch pattern.

You may wish to define a foreground color when you use PREDITOR to add text annotations to an image. Or, with color palette images you can use the foreground color to edit image features.

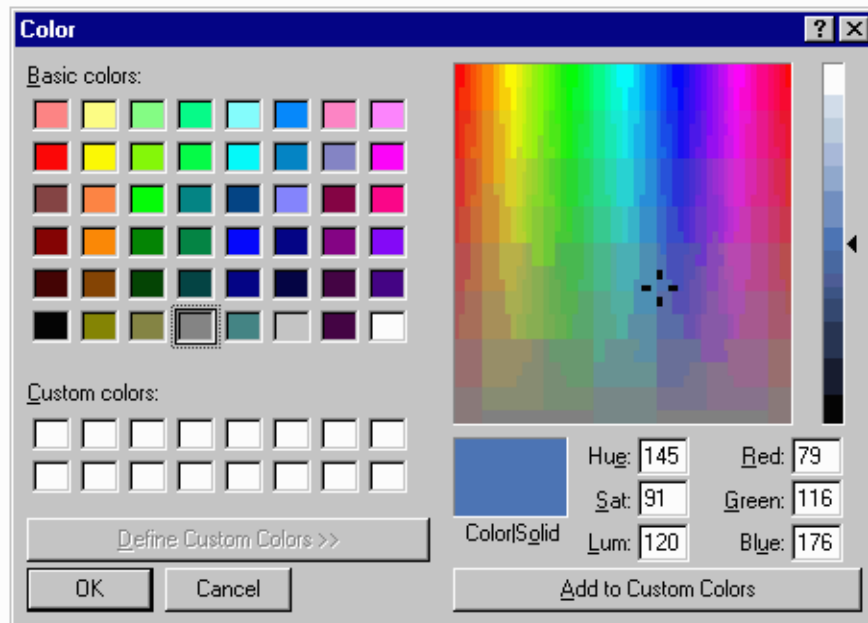


The Colors dialog highlights the available options. For example, if the current image is a grayscale image, the 8-bit grayscale portion of the Colors dialog is active and highlighted, while the remainder is grayed out. In the sample dialog shown above, the current image is a color palette image and the 8-Bit Palette Color section is highlighted in the dialog, while other sections are grayed out.



When you click on the Dialog button, a Color Select dialog appears. For palette images, you can choose a color from among the available colors in the image palette. You can redefine a palette color by clicking on the button, Pick New RGB Color for Index. This brings up the Color dialog.

The color dialog also lets you choose foreground and background colors for 24-bit RGB images.



The following selections are available in the Colors dialog:

24-Bit Color	
Background	Select background color.
Foreground	Select foreground color.
Dialog	Brings up interactive dialog for background or foreground color selection.
Save Custom Colors	Saves the current set of custom colors to a disk file.
Restore Custom Colors	Loads a set of custom colors from a disk file.
Picker Tool	Displays the color picker tool.
8-Bit Palette Color	
Background	Select background color.
Foreground	Select foreground color.
Dialog	Brings up interactive dialog for background or foreground color selection.
Save Palette	Saves the current palette to disk as a palette file.
Restore Palette	Loads a palette file saved with the Save Palette operation from disk.
Original Palette	If palette colors have been redefined, this option cancels palette changes and displays the original palette for the image.
Picker Tool	Displays the color picker tool.
8-Bit Grayscale	
Background	Select background color.
Foreground	Select foreground color.
Picker Tool	Displays the color picker tool.

Image Color Identify

The Image Color Identify dialog lets you interactively select a foreground or background color by clicking the mouse on any pixel in a color or grayscale image.

To use Color Identify:

1. Select Image-Color Identify.
2. Left-click on any pixel in the image to select the foreground color.
3. Right click on any pixel in the image to select the background color.

For 24-bit color files, if the color picker palette is open, selecting a new foreground or background color with Image-Color Identify also changes the color palette in the Color Picker tool. If the picker tool is not open, there is no effect on the palette.

Image Draw All

When there are more image pixels than available screen pixels to display a bi-level image, PREDITOR skips some scan lines to display the image.

Selecting Draw All causes the image to be repainted, redrawing each scan line that contains data. Note that some screen pixels may be repainted more than once.

1. To use Draw All, select Image-Draw All.
2. The image is immediately refreshed in the image window in the Draw All mode. Note that you must re-select Image-Draw All to refresh the image in Draw All mode. To use the Draw All mode for all screen refreshes, use Always Draw All.

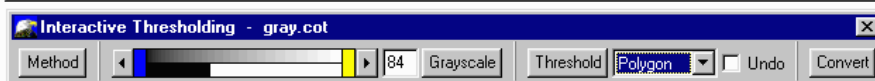
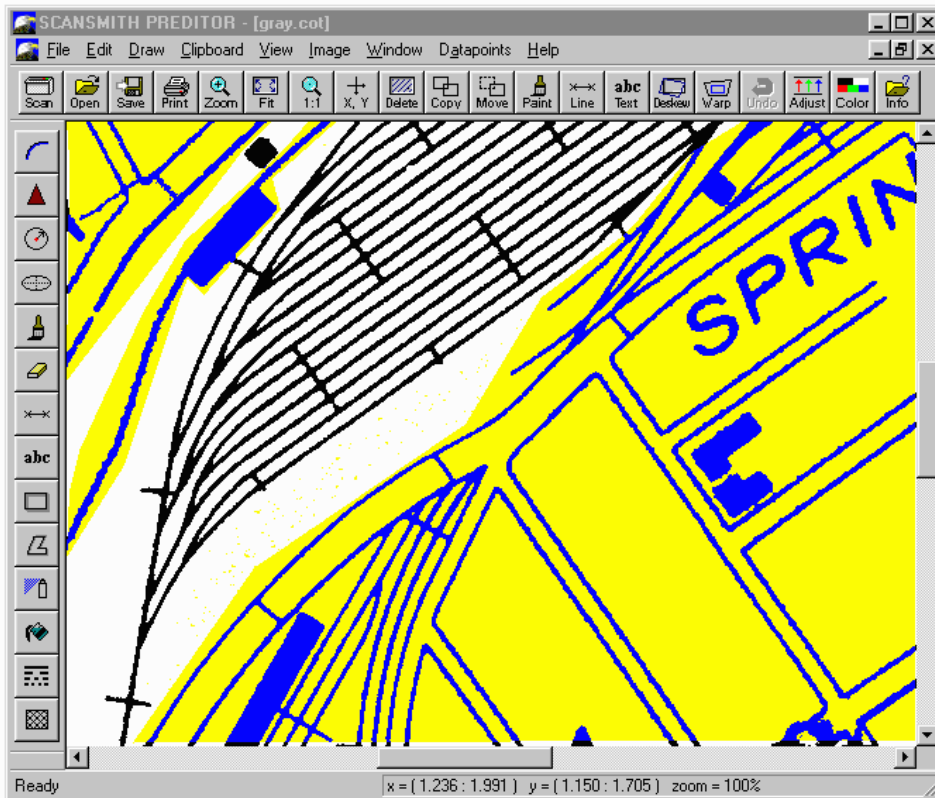
Image Always Draw All

Always Draw All is similar to Draw All, except that Always Draw All, when selected, sets PREDITOR to always use the Draw All mode for image refreshing of bi-level raster images.

1. To use Always Draw All, select Image-Always Draw All.
2. The image is immediately refreshed in the image window in the Draw All mode. Subsequent screen refresh operations will also display the image in the Draw All mode while Always Draw All is active.
3. To stop Draw All mode, deselect the Image-Always Draw All menu selection.

Image Interactive Thresholding

This command brings up the Interactive Thresholding dialog to convert grayscale into bi-level images. Interactive thresholding operates on grayscale images, allowing you to interactively select different threshold settings for different regions of the document. Interactive thresholding is useful if you have a scanned document with a mixture of very dark and very light areas that are difficult to successfully threshold using a single set of thresholding parameters.



Select standard or large aperture thresholding.

Set threshold setting.

Set region color.

Revert to grayscale display.

Threshold selected shape.

Select shape of region to threshold, then use mouse to select.

Allow undo of region selections.

Convert image to bi-level.

What is thresholding?

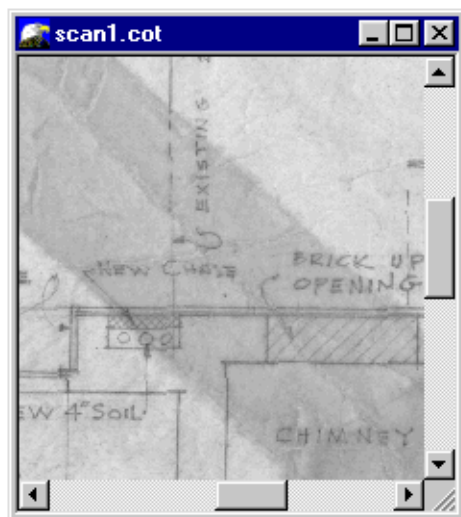
Thresholding is the conversion of grayscale data into a bi-level, or black and white, format. 8-bit grayscale data pixels have a numerical value between 0 and 255 which represents the level of lightness or darkness of the pixel.

Black and white scanning devices internally generate grayscale output data, which must be converted into bi-level form. In some scanners, such as ANA Tech large format scanners, this conversion occurs onboard the scanner, during the scanning process. Other scanners use post-scan methods implemented on the scanner's host computer.

Thresholding is accomplished by processing each pixel in the grayscale data and evaluating the pixel as foreground or background data (e.g., black or white). Straight line thresholding uses a fixed threshold value to compare all grayscale pixel values against. Dynamic thresholding methods use a variable threshold value that changes in response to changes in the background surrounding the pixel being thresholded.

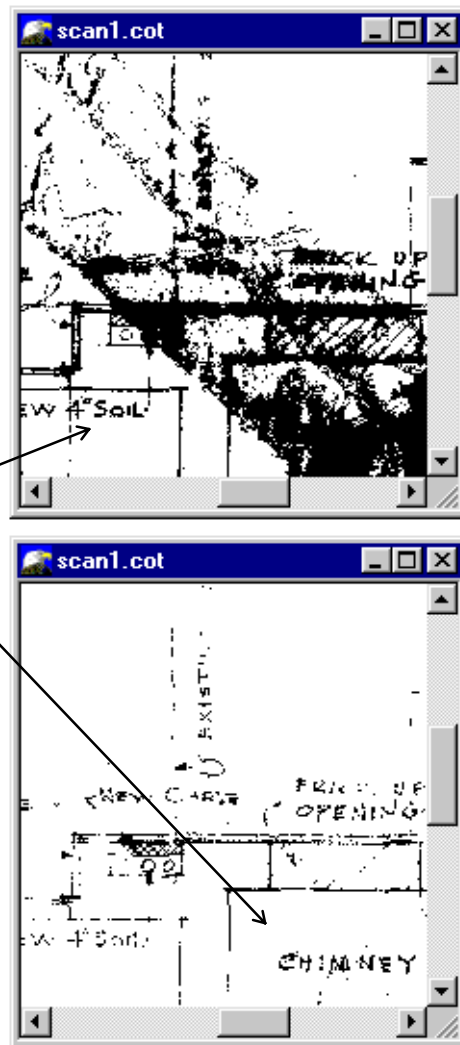
Why is thresholding sometimes difficult?

A problem arises with thresholding with documents that have sudden changes in background level. In these documents it is possible to threshold only a portion of the document. Even sophisticated scanning techniques such as dynamic thresholding may result in some data loss. You may successfully threshold one area, only to find that another area is lost. See the illustration below.



Here is a tape-stained document that is difficult to threshold.

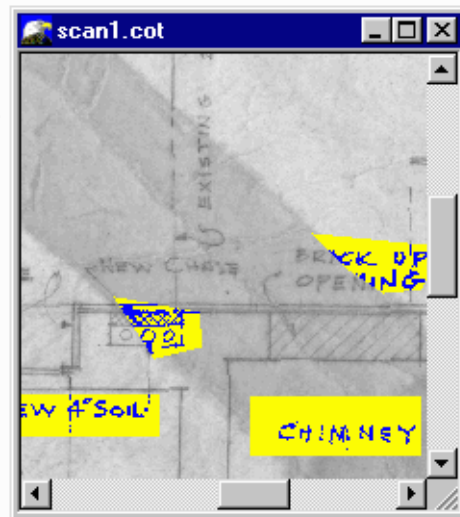
You can threshold one region or the other, but it is difficult to find any threshold setting that will capture both the dark and the light areas. Observe the words "soil" and "chimney" in these illustrations.



What is interactive thresholding?

Interactive thresholding is a very powerful method of post-scan thresholding. Rather than using a single threshold setting, interactive thresholding allows you to use different threshold settings for different regions of the scanned data. In addition, the interactive thresholding feature allows you to use PREDITOR to preview the effect of threshold settings on different parts of the document interactively. With interactive thresholding, you do not need to compromise on a threshold setting that results in overall mediocre data quality; instead, you can select threshold settings that maximize data quality for different regions of the data.

Using interactive thresholding to capture different regions of the scanned data.



How to use interactive thresholding:

1. Open a grayscale image. Select Image-Interactive Thresholding.
2. Select a thresholding method, Straight Line or Large Aperture.
3. Set the threshold setting so that a portion of the image appears to be correctly thresholded. Outline this portion of the image using the region selection tool.

Note that to display the results of the Large Aperture method, you must press the Threshold button to update the display.

4. Again adjust the threshold setting, as needed. Note that the region selected in Step 3 is unchanged. After adjusting the threshold, continue to select the region to lock in the threshold setting for that region, as needed.
5. Press the Grayscale button to restore the original grayscale appearance of unselected regions, if needed.
6. When ready, press Convert. The entire image is converted to a bi-level image.
7. Use File-Save As to save the new bi-level image to disk.

Thresholding Methods

Straight line uses a single threshold for the entire region. Large Aperture uses a dynamic background estimation and a variable threshold. PREDITOR calculates the dynamic background based on the window size which represents a box of pixels around the pixel being evaluated and a threshold setting between 1 and 99.

Undo

If the Undo box is checked, you can use the Undo feature on threshold region selections. There is no Undo for the Convert operation.

Keyboard Shortcuts

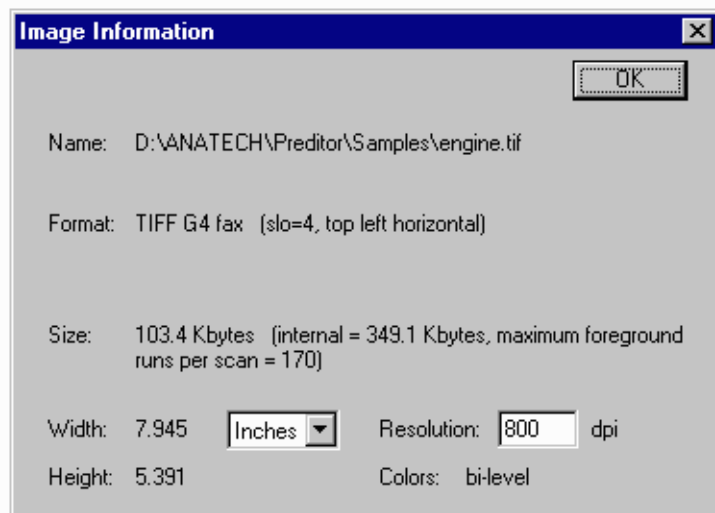
You can use the keyboard arrow keys to operate the interactive thresholding controls.

Left/Right Arrow	Move thresholding scroll bar.
Up Arrow	Set display to Grayscale mode.
Down Arrow	Display current thresholded image.

Image Info



This command brings up an informational dialog that displays file statistics for the current image.



You can select the units for measurement, selecting either inches, centimeters, or pixels. Measurements and image location in the status bar use the specified units. This selection is the same as selecting units in the File-Preferences-Units dialog.

You can change the resolution setting for the image by entering a new resolution in the resolution field. This is useful if you want to specify the resolution for the file header.

- Some files generated by third party software may not list a resolution in the file header. You can use the Image Information dialog to specify a resolution before you save the file. The resolution is then placed in the header of the saved file.
- Also, in some cases you may load a file that lists a resolution different than the resolution at which you want to save the file. You can use the Image Information dialog to specify a new resolution before you save the file.

Note that this resolution setting does not resample or otherwise affect the raster data. It only affects the file header when the image is saved.

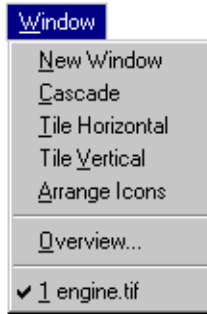
WINDOW MENU



SCANSMITH PREDITOR

9. Window Menu

This section provides information about the PREDITOR Window menu:

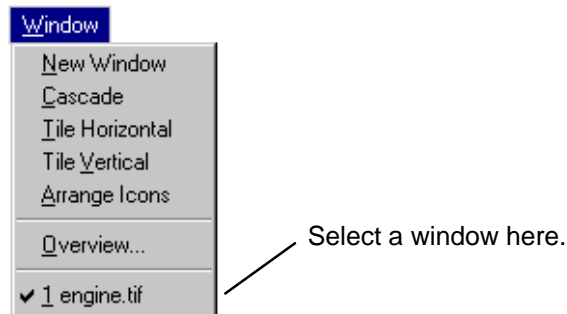


Options

The Window menu selections are standard Windows functions:

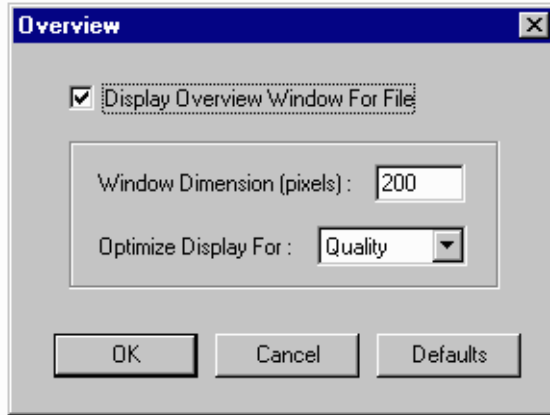
New Window	Opens a new display window for the current image.
Cascade	Cascades currently displayed windows.
Tile Horizontal	Display image windows in a horizontal stack.
Tile Vertical	Display image windows in a vertical side-by-side arrangement.
Arrange Icons	Sort minimized windows displayed as icons.
Overview	Display the overview options dialog.

You can also switch to another window (or drawing) by selecting the window name from the list at the end of the Window menu.



Overview

The Overview selection enables or disables the Overview window and sets the maximum size of the overview window in pixels. You can set the overview display to be optimized for quality or for speed.



1. To use Overview, select Window-Overview.
2. Select overview options as needed:

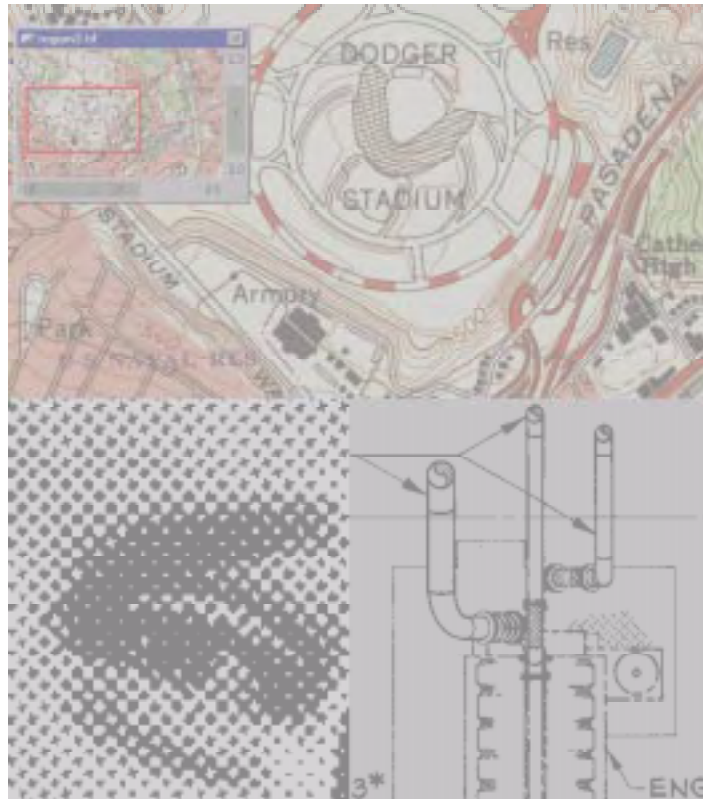
Display Overview Window For File	When checked, the Overview window is displayed. When unchecked, the Overview window is not displayed.
Window Dimension (pixels)	Set the horizontal size of the Overview window. Note, you can also interactively set the Overview window size with the mouse.
Optimize Display For Quality / Speed	Optimize for Quality displays the Overview window using the best quality regardless of speed required for display. Optimize for Speed displays the Overview window using the fastest speed possibly sacrificing some image quality.

3. Press OK when ready.

The Overview window provides an interactive thumbnail view of the data. The rectangle in the Overview window shows the portion of the image which is currently displayed in the data window. You can interactively drag the overview rectangle to change the image display. Additionally, the following mouse-keyboard shortcuts are available:

Shortcut	Action
Left-click mouse + CONTROL key	Zoom in.
Right-click mouse + CONTROL key	Zoom out.
Left-click mouse + SHIFT key	Zoom to 1:1.

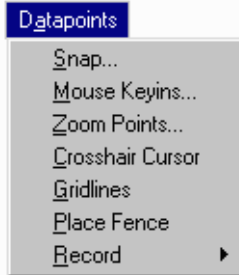
DATAPPOINTS MENU



SCANSMITH PREDITOR

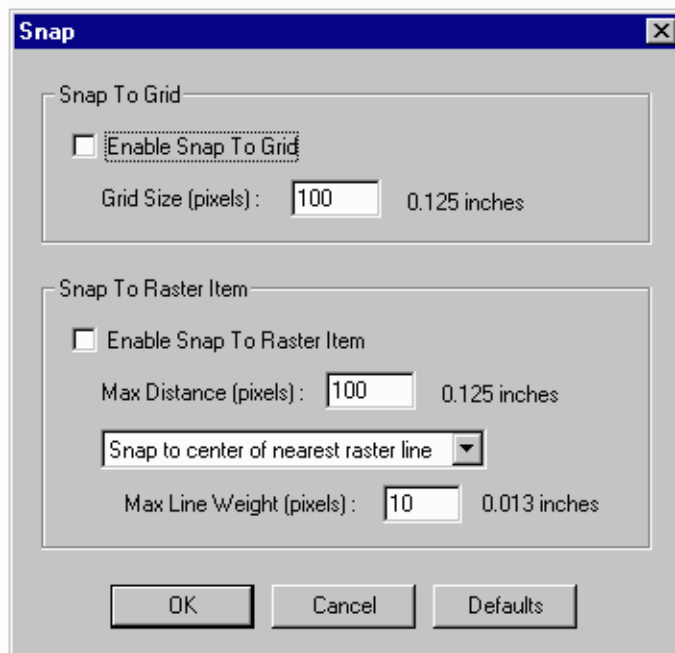
10. Datapoints Menu

This section provides information about the PREDITOR Datapoints menu:



Datapoints Snap

The Snap function determines whether data points are "snapped" to a grid and/or raster foreground data.

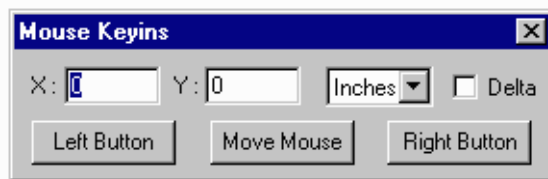


1. To use Snap, select Datapoints-Snap.
2. Check the Enable box for Snap to Grid and/or Raster Item. Click OK when ready.
 - If Enable Snap to Grid is selected, the grid is active with increments of the specified number of pixels.
 - If Snap to Raster Item is Selected, data points snap to the nearest foreground data within the specified Max Distance. You can select snap-to-line to go to the center of the nearest foreground data up to the specified Maximum Line Weight or snap-to-item to go to the edge of the nearest raster item.
 - If both Snap to Grid and Raster Item are selected, data points snap to grid and then the nearest foreground data, in that order.

Note The status bar shows the current Snap status.

Datapoints Mouse Keyins

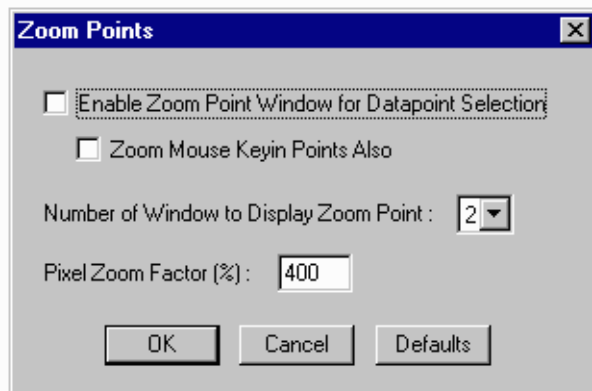
The Mouse Keyins function provides a means of entering precise data points via keyboard input. Mouse keyins is useful when you know exactly where you want to place a data point. You can select inches, centimeters, or pixels to place the points. Coordinates are measured from the lower left hand corner of the drawing. The Left Button and Right Button commands are equivalent to pressing the left or right mouse button at the specified location. Move mouse is used to move the location specified by the mouse cursor without physically moving the mouse. Delta, if enabled, causes selected data points to appear at a location relative to the last entered data point. Thus, Delta is useful to draw raster objects of a specific dimension, for example, by entering one data point normally, and then entering the second data point with Delta enabled.



1. To use Mouse Keyins, select Datapoints-Mouse Keyins.
2. To enter a datapoint, fill in the X, Y position of the datapoint and select Left button. (Select Right Button to enter a right mouse click.)
3. To enter a datapoint at a location relative to the last entered datapoint, check the Delta box and enter X and Y delta values, then select Left Button.
4. The Mouse Keyins dialog remains active, so you can combine normal mouse-generated datapoints with datapoints you enter in the dialog. To remove the dialog, double-click in the upper left hand corner of the Mouse Keyins dialog.

Datapoints Zoom Points

The Zoom Points feature lets you select a zoom point in one window, while the zooming and data point selection occurs in another window. Enable Zoom Point Window for Datapoint Selection enables or disables this feature.



1. To use Zoom Points, select Window-New Window to create an alternate view of the drawing. Use the Window-Tile functions as needed so that both windows are visible.
2. Select Datapoints-Zoom Points. Check the Enable box. Select the Number of Window. Zoom Mouse Keyin Points Also causes data points selected through the Mouse Keyins feature to zoom. The Pixel Zoom Factor determines the amount of image enlargement in the zoom window. Click OK when ready.
3. Perform editing and drawing operations as needed. The zooming occurs in the window number you select in the Zoom Points dialog. In this window, editing and drawing operations are enabled. Clicking on datapoints in the other window does not invoke edit or draw functions, but instead merely recenters the zoom window about the selected datapoint.
4. The status bar shows the current Zoom Points status.
5. To end Zoom Points mode, bring up the Zoom Points dialog and uncheck the Enable box, then select OK.

Note The status bar shows the current Zoom Points status.

Datapoints Crosshair Cursor

Check the Crosshair Cursor menu item to enable a horizontal and vertical crosshair that shows the current cursor position. The crosshair cursor is useful to locate the cursor when displaying large raster images or images with many details where the cursor tends to become “lost.”

Datapoints Gridlines

Check the Gridlines menu item to enable or disable gridlines. When gridlines are enabled, horizontal and perpendicular gridlines are displayed at an interval of about one inch on the display monitor. These gridlines are useful as a visual reference. Gridlines are independent of the zoom level. Note that the gridlines displayed by the Datapoints-Gridlines option are not related to grid settings you can specify in Datapoints-Snap.

Datapoints Place Fence

Select a rectangular fence to use for Windows printing and for the Delete and Flood commands.

Printing

When the Print Fence option is selected in the Print dialog, data inside the fence is printed. Data outside the fence is ignored.

Delete

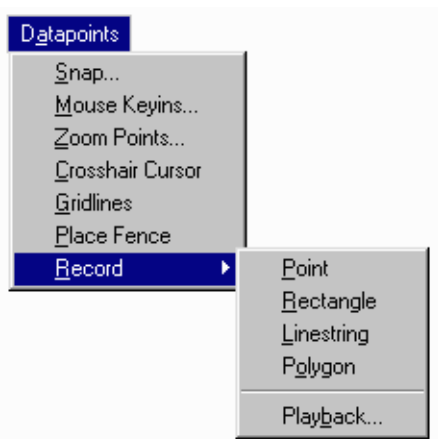
When the Fence is enabled in the Edit-Delete operation, the fence is used to define a set of colors. All pixels in the Delete region in the color set defined by the fence are deleted.

Flood

When the Fence is enabled in the Draw-Flood operation, the fence is used to define a set of colors. All contiguous pixels in the Flood region in the color set defined by the fence are flooded.

Datapoints Record

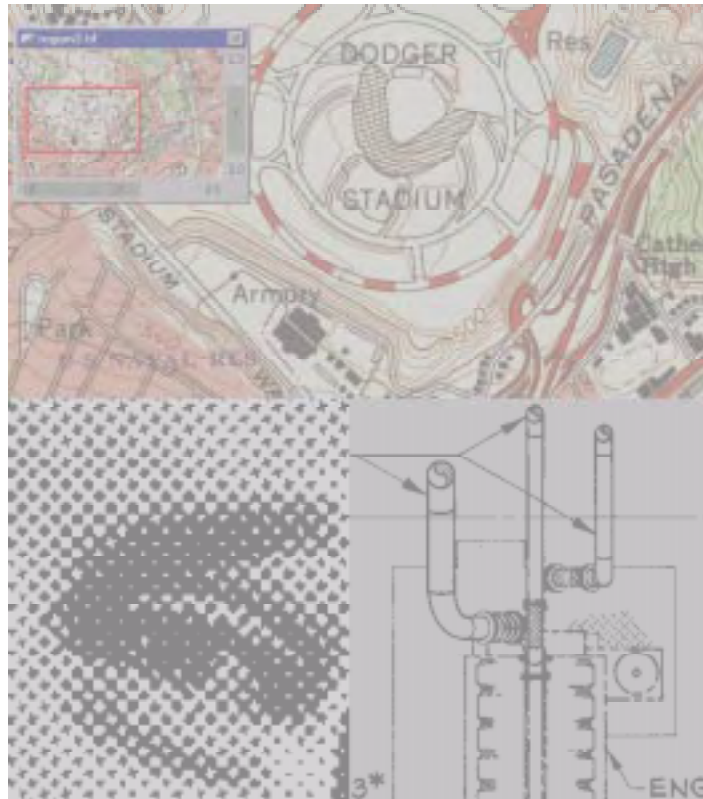
The Record feature allows you to store a sequence of datapoint selection commands as a script file. You can then load this script at any later time to duplicate the exact sequence of datapoints that was recorded. PREDITOR prompts for a script file name to store the datapoints. The Playback command prompts for the name of a script file of datapoints, and then executes the script.



To use Datapoints-Record:

1. To create a record:
 - Select Datapoints-Record. Select one of the region types, Point, Rectangle, Linestring, or Polygon.
 - Use the mouse to select a point, rectangle, linestring, or polygon.
 - When prompted, enter a name for the Datapoints-Record file. The file is saved as a script (SCR) text file.
2. To play back the selected datapoints for raster operations:
 - Display the image on which you want to apply the raster operation.
 - Start the raster operation (rotate, warp, draw linestring, etc.) by selecting its icon or selecting it in the pulldown menu.
 - Use Datapoints-Record-Playback to perform data point selection for the raster operation. When prompted, select the script saved in Step 1. The datapoints are automatically selected. If the datapoint selection is sufficient to start the raster operation, the raster operation will execute.

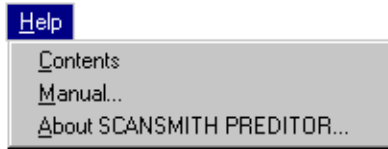
HELP MENU



SCANSMITH PREDITOR

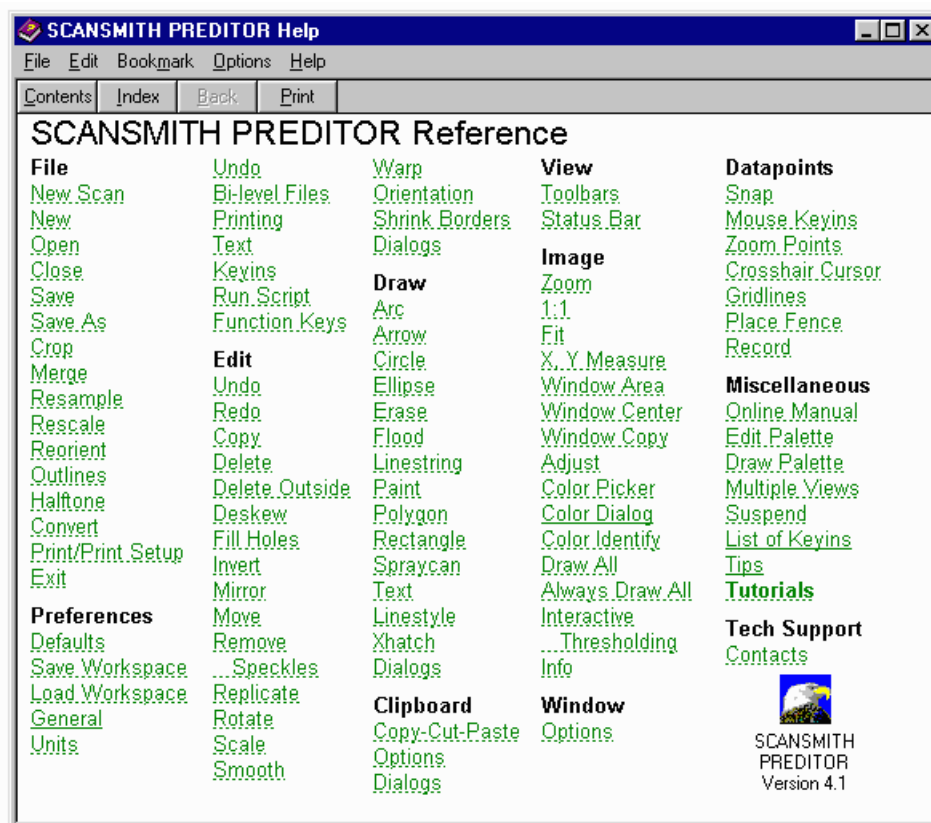
11. Help Menu

This section provides information about the PREDITOR Help menu:



Help Contents

The Contents function launches the PREDITOR online help system.



Help Manual

The Manual command displays the SCANSMITH PREDITOR User Guide (this book) online in Adobe Acrobat format. Note that the free Adobe Acrobat Reader must be installed for this feature to function. The reader software is installed as an optional part of the SCANSMITH PREDITOR setup program. Information about the Adobe Acrobat Reader is also available on the World Wide Web at Adobe Systems Inc. home page, at:

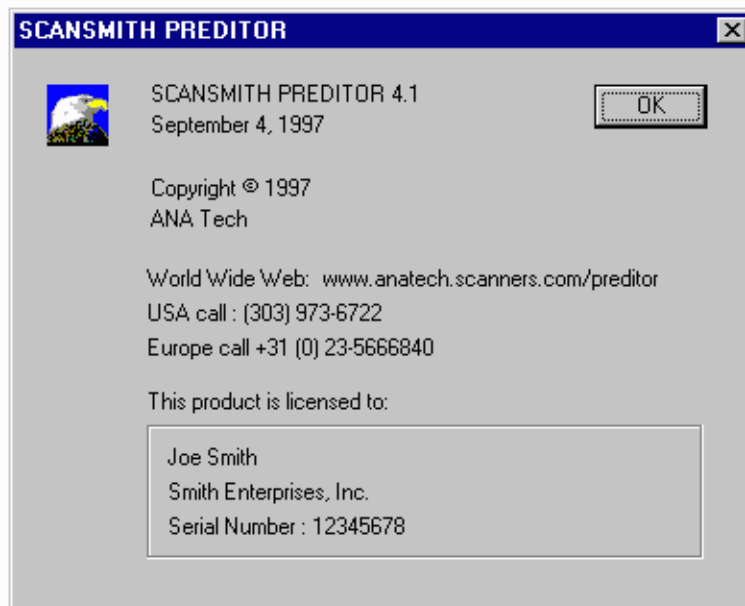
<http://www.adobe.com>

When SCANSMITH SCAN and SCANSMITH PREDITOR software updates are released on the World Wide Web, updated versions of the SCANSMITH SCAN User Guide and SCANSMITH PREDITOR User Guide, in Adobe Acrobat format, are also released and are available for download from the same web page that has the software updates. To view the latest documentation for SCANSMITH PREDITOR, download and install the upgrade and download the updated User Guide and save it in the SCANSMITH PREDITOR installation directory. Software updates for SCANSMITH PREDITOR are available from ANA Tech's World Wide Web site at:

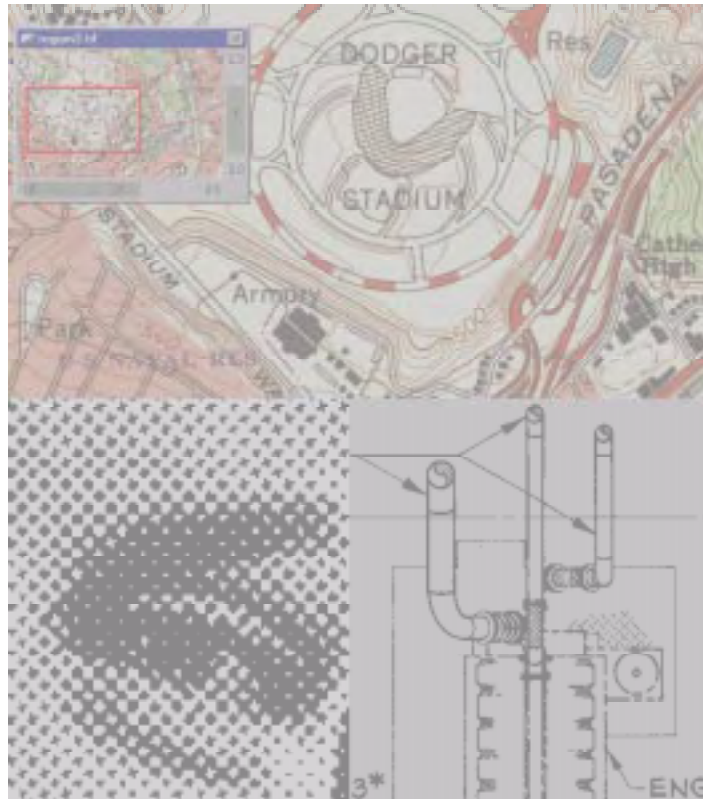
<http://www.anatech.scanners.com/preditor>

About

The About function displays a dialog with current version information.



APPENDIX A



SCANSMITH PREDITOR

A. Keyins

Keyins are entered in the Preferences Keyins dialog. Or you can use Preferences Run Script to run a script file that contains keyins. Refer to the File-Preferences-Keyins and File-Preferences-Run Script sections for details.

File Menu

File New

```
file new defaults
file new image type bilevel          default
file new image type 24bit color
file new image type 8bit color
file new ncolors [n]                 default = 256
file new image type grayscale
file new bilevel format [ext]        default = tif
file new 24bit color format [ext]    default = tif
file new 8bit color format [ext]     default = tif
file new grayscale format [ext]     default = tif
file new width [w]                   default = 10.0
file new height [h]                  default = 10.0
file new dpi [d]                     default = 200
file new slo [s]                     default = 4
file new redline name [file]
file new units inches                 default
file new units centimeters
file new units pixels
file new units millimeters
file new
```

File Open

```
file open dialog
file open format [extension]
file open name [file]
```

File Close

```
file close
```

File Save

```
file save
```

File Save As

```
file save as dialog
file save as format [extension]
file save as name [file]
file save as clear status
file save as separates dialog
file save as separates defaults
file save as separates slo [0,1,...,7] default = 4
file save as separates mirror x on
file save as separates mirror x off default
file save as separates mirror y on
file save as separates mirror y off default
```

```

file save as separates mode single pass          default
file save as separates mode multiple pass
file save as separates mode multiple pass temp
file save as separates format [extension]        default = tif
file save as separates extension [extension]     default = tif
file save as separates name [file]

output options tiff defaults
output options tiff format uncompressed
output options tiff format packbits
output options tiff format group 3 b
output options tiff format group 3 fax
output options tiff format group 4 fax          default
output options tiff format group 3 2d
output options tiff strips on
output options tiff strips off                  default
output options tiff rows per strip [value]      default = 10
output options gtx defaults
output options gtx level 2                     default
output options gtx level 3
output options rst defaults
output options rst mk1                         default
output options rst mk2
output options jpeg defaults
output options jpeg quality [factor]           default = 75
output options gif defaults
output options gif version 87a                 default
output options gif version 89a
output options gif interlace on
output options gif interlace off              default
output options gif transparent bg on
output options gif transparent bg off          default
output options gif transparent index [n]       default=0
output options jpeg defaults
output options jpeg quality [factor]           default=75

```

File Crop

```

file crop dialog
file crop defaults
file crop region rectangle                    default
file crop region polygon
file crop limit on
file crop limit off                          default
file crop format [extension]
file crop name [file]

```

File Merge

```
file merge dialog
file merge defaults
file merge background transparent          default
file merge background opaque
file merge undo on                        default
file merge undo off
file merge format [extension]
file merge name [file]
```

File Resample

```
file resample dialog
file resample dpi [density]              default = 400
file resample format [extension]
file resample name [file]
```

File Rescale

```
file rescale dialog
file rescale percent [factor]            default = 100
file rescale format [extension]
file rescale name [file]
```

File Reorient

```
file reorient dialog
file reorient slo [0,1,...,7]            default = 4
file reorient format [extension]
file reorient name [file]
```

File Outlines

```
file outlines dialog
file outlines defaults
file outlines region rectangle
file outlines region polygon
file outlines region entire image        default
file outlines name [file]
output options dxf defaults
output options dxf layer name [string]   default = 0
output options dxf color number [string] default = default
output options dxf maximum vertices [value] default = 99
output options dxf reorigin on           default
output options dxf reorigin off
```

File Halftone

```
file halftone dialog
file halftone defaults
file halftone region rectangle          default
file halftone region entire image
```

```

file halftone dpi [density]                default = 300
file halftone scale [percent]              default = 100
file halftone method ordered pattern       default
file halftone method error diffusion
file halftone pattern [name]               default = dither 1
file halftone full resolution on           default
file halftone full resolution off
file halftone slo [0,1,...,7]              default = 4
file halftone format [extension]           default = tif
file halftone name [file]

```

File Convert

```

file convert dialog
file convert input file name [file]
file convert lut name [file]
file convert output format intergraph cot
file convert output format intergraph crl
file convert output format intergraph t27
file convert output format intergraph rgb
file convert output format intergraph t29
file convert output format tiff rgb
file convert output format tiff 8 bit uncompressed
file convert output format tiff 8 bit compressed
file convert output format tiff 4 bit uncompressed
file convert output format pcx
file convert output format jpeg 8 bit
file convert output format jpeg 24 bit
file convert output format bmp 4 bit
file convert output format bmp 8 bit
file convert output format bmp 24 bit
file convert output name [file]

```

File Print

```

file print dialog
file print defaults
file print
file print setup dialog
file print setup defaults
file print setup port [LPT1,LPT2]          default = LPT1
file print setup printer [HP DesignJet 650C] default = HP DesignJet650C
file print setup scale [percent]           default = 100
file print setup advanced matching automatic default
file print setup advanced matching adjustable
file print setup advanced matching none
file print setup advanced gamma [value]    default = 1.0
file print setup advanced profile [file]
file print windows orientation portrait     default
file print windows orientation landscape
file print windows position corner          default
file print windows position center
file print windows size actual              default
file print windows size fit
file print windows size scale
file print windows scale percent [percent] default = 100
file print windows window on

```

```
file print windows window off                default
file print windows fence on
file print windows fence off                default
file print windows copies [n]              default = 1
file print windows driver name [string]
file print windows device name [string]
file print windows port name [string]
file print windows previous printer
file print iplot queue [name]
file print iplot manager [path.exe]        default = isubmit.exe
file print iplot temporary always on
file print iplot temporary always off      default
file print iplot temporary delete on       default
file print iplot temporary delete off
file print iplot temporary directory [dir]
file print iplot area drawing              default
file print iplot area window
file print iplot area fence
file print iplot size actual                default
file print iplot size ansi a
file print iplot size ansi b
file print iplot size ansi c
file print iplot size ansi d
file print iplot size ansi e
file print iplot size iso 0
file print iplot size iso 1
file print iplot size iso 2
file print iplot size iso 3
file print iplot size iso 4
file print iplot size fit
file print iplot size scale [percent]      default = 100
file print iplot copies [n]                default = 1
file print iplot annotate none              default
file print iplot annotate automatic
file print iplot annotate custom [t]
file print iplot annotate font name         default = Arial
file print iplot annotate size [pt]         default = 18
file print iplot annotate style regular     default
file print iplot annotate style italic
file print iplot annotate style bold
file print iplot annotate style bold italic
file print iplot border on
file print iplot border off                default
file print iplot apply adjust on
file print iplot apply adjust off          default
```

File Exit

exit

Preferences keyins

Preferences Load / Save Workspace

```

preferences save workspace dialog
preferences save workspace name [file]
preferences load workspace dialog
preferences load workspace name [file]
preferences save workspace exit on          default
preferences save workspace exit off

```

Preferences General

```

preferences general dialog
preferences general defaults
preferences general temporary directory [path]    default is
                                                    system dependent
preferences general image ram limit [mbytes]     default = 8
preferences general working ram [mbytes]         default = 4
preferences general maximum dimension [pixels]   default = 65000
preferences general maximum dimension [in]inches
preferences general maximum dimension [cm]cm
preferences general maximum runs [count]        default = 2048
preferences general fast loading on             default
preferences general fast loading off
preferences general image ram cache on
preferences general image ram cache off         default
preferences general save adjustments on         default
preferences general save adjustments off
preferences general save adjustments on         default
preferences general save adjustments off

```

Preferences Units

```

preferences units dialog
preferences units defaults
preferences units inches                        default
preferences units centimeters
preferences units pixels
preferences units millimeters
preferences units measure factor [f]          default = 1.0

```

Preferences Undo

```

preferences undo dialog
preferences undo disable all
preferences undo defaults
preferences undo maximum [count]              default = 5
preferences undo merge on                     default
preferences undo merge off
preferences undo copy on                       default

```

```
preferences undo copy off
preferences undo delete on default
preferences undo delete off
preferences undo delete outside on
preferences undo delete outside off default
preferences undo deskew on
preferences undo deskew off default
preferences undo fill holes on default
preferences undo fill holes off
preferences undo invert on default
preferences undo invert off
preferences undo mirror on default
preferences undo mirror off
preferences undo move on default
preferences undo move off
preferences undo remove speckles on default
preferences undo remove speckles off
preferences undo replicate on default
preferences undo replicate off
preferences undo rotate on default
preferences undo rotate off
preferences undo scale on default
preferences undo scale off
preferences undo smooth on default
preferences undo smooth off
preferences undo warp on default
preferences undo warp off
preferences undo arc on default
preferences undo arc off
preferences undo arrow on default
preferences undo arrow off
preferences undo circle on default
preferences undo circle off
preferences undo ellipse on default
preferences undo ellipse off
preferences undo erase on default
preferences undo erase off
preferences undo flood on default
preferences undo flood off
preferences undo linestring on default
preferences undo linestring off
preferences undo paint on default
preferences undo paint off
preferences undo polygon on default
preferences undo polygon off
preferences undo rectangle on default
preferences undo rectangle off
preferences undo spraycan on default
preferences undo spraycan off
preferences undo text on default
preferences undo text off
preferences undo clipboard on default
preferences undo clipboard off
```

Preferences Bi-level Files

```

preferences bilevel dialog
preferences bilevel defaults
preferences bilevel gridlines on          default
preferences bilevel gridlines off
preferences bilevel tracking on           default
preferences bilevel tracking off
preferences bilevel tracking red [r]      default=255
preferences bilevel tracking green [g]    default=0
preferences bilevel tracking blue [b]     default=0
preferences bilevel tracking prompt on    default
preferences bilevel tracking prompt off

```

Preferences Printing

```

preferences printing dialog
preferences printing defaults
preferences printing type windows        default
preferences printing type custom
preferences printing type iplot

```

Preferences Text

```

preferences text dialog
preferences text defaults
preferences text windows fonts on        default
preferences text windows fonts off

```

Preferences Keyins

```
keyins dialog close
```

Preferences Script

```

script dialog
script run name [file]
script delete on
script delete off                          default

```

Preferences Function Keys

```

function keys dialog
function keys defaults
function keys define 1 [command string] default = function keys dialog
function keys define 2 [command string] default = help
function keys define 3 [command string] default = image zoom
function keys define 4 [command string] default = image fit
function keys define 5 [command string] default = image 1:1
function keys define 6 [command string] default = image measure
function keys define 7 [command string] default = image window area
function keys define 8 [command string] default = image info

```

```
function keys define 9 [command string] default = window new
function keys define 10 [command string] default = window cascade
function keys define 11 [command string] default = window tile horizontal
function keys define 12 [command string] default = window tile vertical
function keys execute [number]
```

Edit Menu

Edit Undo

undo

Edit Redo

redo

Edit Copy

```
copy dialog
copy defaults
copy region rectangle          default
copy region polygon
copy region raster item
copy background transparent    default
copy background opaque
copy foreground only on
copy foreground only off      default
copy
```

Edit Delete

```
delete dialog
delete defaults
delete region rectangle        default
delete region polygon
delete region raster item
delete pixels all              default
delete pixels foreground
delete pixels nonforeground
delete fuzzy [n]              default = 0
delete pixels defined fence
delete
```

Edit Delete Outside

```
delete outside dialog
delete outside defaults
delete outside region rectangle default
delete outside region polygon
delete outside shrink borders on default
delete outside shrink borders off
delete outside undo on
delete outside undo off       default
delete outside
```

Edit Deskew

deskew undo on
deskew undo off default
deskew

Edit Fill Holes

fill holes dialog
fill holes defaults
fill holes size [pixels] default = 5
fill holes size [in]inches
fill holes size [cm]cm
fill holes size [mm]mm
fill holes region rectangle
fill holes region entire image default
fill holes undo entire image on
fill holes undo entire image off default
fill holes

Edit Invert

invert dialog
invert defaults
invert region rectangle default
invert region polygon
invert region entire image
invert undo entire image on
invert undo entire image off default
invert

Edit Mirror

mirror dialog
mirror defaults
mirror about horizontal axis on default
mirror about horizontal axis off
mirror about vertical axis on default
mirror about vertical axis off
mirror region rectangle default
mirror region polygon
mirror region item
mirror region entire image
mirror place in place default
mirror place copy
mirror place move
mirror undo entire image on
mirror undo entire image off default
mirror

Edit Move

```

move dialog
move defaults
move region rectangle          default
move region polygon
move region raster item
move background transparent    default
move background opaque
move foreground only on
move foreground only off      default
move

```

Edit Remove Speckles

```

remove speckles dialog
remove speckles defaults
remove speckles size [pixels]  default = 5
remove speckles size [in]inches
remove speckles size [cm]cm
remove speckles size [mm]mm
remove speckles region rectangle
remove speckles region entire image  default
remove speckles undo entire image on
remove speckles undo entire image off default
remove speckles

```

Edit Replicate

```

replicate dialog
replicate defaults
replicate count [number]      default = 3
replicate region rectangle    default
replicate region polygon
replicate region raster item
replicate background transparent  default
replicate background opaque
replicate foreground only on
replicate foreground only off    default
replicate

```

Edit Rotate

```

rotate dialog
rotate defaults
rotate angle [degrees]        default = 30.0
rotate region rectangle        default
rotate region polygon
rotate region raster item
rotate region entire image
rotate place in place          default

```

```
rotate place copy
rotate place move
rotate undo entire image on
rotate undo entire image off          default
rotate
```

Edit Scale

```
scale dialog
scale defaults
scale factor percent x [percent]     default = 200.0
scale factor percent y [percent]     default = 200.0
scale region rectangle                default
scale region polygon
scale region raster item
scale region entire image
scale place in place                  default
scale place copy
scale place move
scale undo entire image on
scale undo entire image off          default
scale
```

Edit Smooth

```
smooth dialog
smooth defaults
smooth region rectangle
smooth region entire image           default
smooth foreground add on              default
smooth foreground add off
smooth foreground delete on           default
smooth foreground delete off
smooth undo entire image on
smooth undo entire image off         default
smooth
```

Edit Warp

```
warp dialog
warp defaults
warp model helmert                   default
warp model projective
warp model affine 1
warp model affine 2
warp model affine 3
warp model affine 4
warp model affine 5
warp region rectangle
warp region polygon
warp region entire image              default
warp undo entire image on
warp undo entire image off           default
warp enter points
```

```
warp restore points name [file]
warp visual defaults
warp visual enable on          default
warp visual enable off
warp visual source on         default
warp visual source off
warp visual space [inches]    default=0.25
warp
```

Edit Orientation

```
orientation dialog
orientation slo [0,1,...,7]
orientation rotate clockwise
orientation rotate counterclockwise
orientation flip about horizontal axis
orientation flip about vertical axis
```

Edit Shrink Borders

```
shrink borders
```

Edit Dialogs

```
edit dialogs on          default
edit dialogs off
```

Edit Toolbar

```
edit toolbar on          default
edit toolbar off
```

Draw Menu

Draw Arc

```
arc dialog
arc defaults
arc mode outline                default
arc mode filled
arc outline weight [pixels]    default = 5
arc outline weight [in]inches
arc outline weight [cm]cm
arc outline weight [mm]mm
arc rop foreground              default
arc rop background
arc rop invert
arc rop xhatch
arc
```

Draw Arrow

```
arrow dialog
arrow defaults
arrow mode outline
arrow mode filled              default
arrow outline weight [pixels]  default = 5
arrow outline weight [in]inches
arrow outline weight [cm]cm
arrow outline weight [mm]mm
arrow rop foreground            default
arrow rop background
arrow rop invert
arrow rop xhatch
arrow ratio [value]            default = 2.0
arrow
```

Draw Circle

```
circle dialog
circle defaults
circle mode outline            default
circle mode filled
circle outline weight [pixels] default = 5
circle outline weight [in]inches
circle outline weight [cm]cm
circle outline weight [mm]mm
circle method diameter         default
circle method radius
circle rop foreground           default
circle rop background
circle rop invert
circle rop xhatch
circle
```

Draw Ellipse

```

ellipse dialog
ellipse defaults
ellipse mode outline                default
ellipse mode filled
ellipse outline weight [pixels]     default = 5
ellipse outline weight [in]inches
ellipse outline weight [cm]cm
ellipse outline weight [mm]mm
ellipse rop foreground                default
ellipse rop background
ellipse rop invert
ellipse rop xhatch
ellipse

```

Draw Erase

```

erase dialog
erase defaults
erase size [pixels]                 default = 5
erase size [in]inches
erase size [cm]cm
erase size [mm]mm
erase shape square                   default
erase shape round
erase shape flat horizontal
erase shape flat vertical
erase shape flat +45 degrees
erase shape flat -45 degrees
erase

```

Draw Flood

```

flood dialog
flood defaults
flood mode background to foreground default
flood mode background to xhatch
flood mode foreground to background
flood mode foreground to xhatch
flood fuzzy [n]                     default = 0
flood fence on                       default
flood fence off
flood

```

Draw Linestring

```

linestring dialog
linestring defaults
linestring weight [pixels]          default = 5
linestring weight [in]inches
linestring weight [cm]cm
linestring weight [mm]mm
linestring corner straight           default
linestring corner rounded

```

```
linestring corner blunt
linestring corner none
linestring rop foreground          default
linestring rop background
linestring rop invert
linestring rop xhatch
linestring snap on
linestring snap off               default
linestring snap angle [degrees]  default = 30.0
linestring
```

Draw Paint

```
paint dialog
paint defaults
paint size [pixels]              default = 5
paint size [in]inches
paint size [cm]cm
paint size [mm]mm
paint shape square               default
paint shape round
paint shape flat horizontal
paint shape flat vertical
paint shape flat +45 degrees
paint shape flat -45 degrees
paint xhatch on
paint xhatch off                default
paint
```

Draw Polygon

```
polygon dialog
polygon defaults
polygon mode outline             default
polygon mode filled
polygon outline weight [pixels]  default = 5
polygon outline weight [in]inches
polygon outline weight [cm]cm
polygon outline weight [mm]mm
polygon rop foreground            default
polygon rop background
polygon rop invert
polygon rop xhatch
polygon snap on
polygon snap off                 default
polygon snap angle [degrees]    default = 30.0
polygon
```

Draw Rectangle

```
rectangle dialog
rectangle defaults
rectangle mode outline           default
rectangle mode filled
rectangle outline weight [pixels] default = 5
rectangle outline weight [in]inches
```

```

rectangle outline weight [cm]cm
rectangle outline weight [mm]mm
rectangle rop foreground          default
rectangle rop background
rectangle rop invert
rectangle rop xhatch
rectangle

```

Draw Spraycan

```

spraycan dialog
spraycan defaults
spraycan pattern name [file]    default = dots.tif
spraycan

```

Draw Text

```

windows text dialog
windows text defaults
windows text font name [font]   default = Arial
windows text style regular      default
windows text style italic
windows text style bold
windows text style bold italic
windows text size [points]      default = 18
windows text angle [degrees]    default = 0
windows text rop foreground     default
windows text rop background
windows text rop invert
windows text rop xhatch
windows text background transparent default
windows text background opaque
windows text string [string]
windows text

text dialog
text defaults
text string [text]
text height [pixels]           default = 50
text height [in]inches
text height [cm]cm
text height [mm]mm
text weight [pixels]           default = 5
text weight [in]inches
text weight [cm]cm
text weight [mm]mm
text gap [pixels]              default = 15
text gap [in]inches
text gap [cm]cm
text gap [mm]mm
text angle [degrees]           default = 0.0
text rop foreground            default
text rop background
text rop invert
text rop xhatch
text proportional spacing on   default
text proportional spacing off

```

```
text background transparent      default
text background opaque
text font name [file]           default = default.fon
text
```

Draw Linestyle

```
linestyle dialog
linestyle defaults
linestyle type [0,1,...,7]      default = 0
linestyle factor [value]       default = 1.0
linestyle user defined [number] [hex value of pattern]
```

Draw Xhatch

```
xhatch dialog
xhatch defaults
xhatch type grid                default
xhatch type pattern
xhatch grid +45 on              default
xhatch grid +45 off
xhatch grid -45 on              default
xhatch grid -45 off
xhatch grid horizontal on      default
xhatch grid horizontal off
xhatch grid vertical on        default
xhatch grid vertical off
xhatch grid weight [pixels]    default = 5
xhatch grid weight [in]inches
xhatch grid weight [cm]cm
xhatch grid weight [mm]mm
xhatch grid space [pixels]     default = 20
xhatch grid space [in]inches
xhatch grid space [cm]cm
xhatch grid space [mm]mm
xhatch pattern name [file]     default = pat07.tif
xhatch background opaque       default
xhatch background transparent
xhatch invert on                default
xhatch invert off
```

Draw Dialogs

```
draw dialogs on                default
draw dialogs off
```

Draw Toolbar

```
draw toolbar on                default
draw toolbar off
```

Clipboard Menu

Clipboard Copy

```

clipboard copy dialog
clipboard copy defaults
clipboard copy region rectangle          default
clipboard copy region polygon
clipboard copy region raster item
clipboard copy region entire image
clipboard copy invert on
clipboard copy invert off                default
clipboard copy mirror about vertical axis on
clipboard copy mirror about vertical axis off  default
clipboard copy mirror about horizontal axis on
clipboard copy mirror about horizontal axis off default
clipboard copy

```

Clipboard Cut

```

clipboard cut dialog
clipboard cut defaults
clipboard cut region rectangle          default
clipboard cut region polygon
clipboard cut region raster item
clipboard cut invert on
clipboard cut invert off                default
clipboard cut mirror about vertical axis on
clipboard cut mirror about vertical axis off  default
clipboard cut mirror about horizontal axis on
clipboard cut mirror about horizontal axis off default
clipboard cut

```

Clipboard Paste

```

clipboard paste dialog
clipboard paste defaults
clipboard paste background opaque
clipboard paste background transparent    default
clipboard paste invert on
clipboard paste invert off                default
clipboard paste mirror about vertical axis on
clipboard paste mirror about vertical axis off  default
clipboard paste mirror about horizontal axis on
clipboard paste mirror about horizontal axis off default
clipboard paste

```

Clipboard Options

```

clipboard options dialog
clipboard options defaults
clipboard options bilevel format dib      default (Win3.1)
clipboard options bilevel format bitmap   default (WinNT,Win95)

```

clipboard options multilevel format dib	default
clipboard options apply image adjust on	
clipboard options apply image adjust off	default

Clipboard Dialogs

clipboard dialogs on	default
clipboard dialogs off	

View Menu

View Main Toolbar

view toolbar toggle display
view toolbar on default
view toolbar off

View Edit Toolbar

edit toolbar on default
edit toolbar off

View Draw Toolbar

draw toolbar on default
draw toolbar off

View Status Bar

view status bar toggle display
view status bar on default
view status bar off

Image Menu

Image Zoom

image zoom

Image 1:1

image 1:1

Image Fit

image fit

Image Measure

image measure

Image Window Area

image window area

Image Window Center

image window center

Image Window Copy

image window copy

Image Adjust

```
image adjust dialog
image adjust defaults
image adjust dialog close
image adjust restore default
image adjust save as default
image adjust save levels [values]           default=256
image adjust restore lut name [file]
image adjust save lut name [file]
image adjust identity
image adjust equalize
image adjust brightness [value]             default = 0
image adjust contrast [value]               default = 0
image adjust gamma [value]                  default = 2.0
image adjust black reference [value]         default = 0
image adjust white reference [value]         default = 255
image adjust lock on
image adjust lock off                       default
```

```
image adjust select rgb          default
image adjust select red
image adjust select green
image adjust select blue
```

Image Color Picker

```
image colors picker tool
image colors palette picker tool
image colors grayscale picker tool
```

Image Color Dialog

```
image colors dialog
image colors defaults
image colors background dialog
image colors background red [value]      default = 255
image colors background green [value]    default = 255
image colors background blue [value]     default = 255
image colors foreground dialog
image colors foreground red [value]       default = 0
image colors foreground green [value]     default = 0
image colors foreground blue [value]      default = 0
image colors save custom colors name [file]
image colors restore custom colors name [file]
image colors palette background dialog
image colors palette foreground dialog
image colors palette background [value]   default = 0
image colors palette foreground [value]   default = 1
image colors palette color [index] [r] [g] [b]
image colors save palette name [file]
image colors restore palette name [file]
image colors grayscale background [value] default = 255
image colors grayscale foreground [value] default = 0
```

Image Color Identify

```
image colors identify
```

Image Draw All

```
image draw all
```

Image Always Draw All

```
image always draw all on
image always draw all off          default
```

Image Interactive Thresholding

```
image interactive thresholding dialog
image interactive thresholding straight line default
image interactive thresholding large aperture
image interactive thresholding aperture size [n] default = 30
image interactive thresholding threshold [n] default = 128
image interactive thresholding delta [n] default = 2
image interactive thresholding display grayscale
image interactive thresholding rectangle default
image interactive thresholding polygon
image interactive thresholding active window
image interactive thresholding drawing
image interactive thresholding colors defaults
image interactive thresholding colors dialog
image interactive thresholding background red default = 255
image interactive thresholding background green default = 255
image interactive thresholding background blue default = 0
image interactive thresholding foreground red default = 0
image interactive thresholding foreground green default = 0
image interactive thresholding foreground blue default = 255
image interactive thresholding convert
```

Image Info

```
image info
image info set dpi [value]
```

Window Menu

Window New

window new

Window Cascade

window cascade

Window Tile Horizontal

window tile horizontal

Window Tile Vertical

window tile vertical

Window Arrange Icons

window arrange icons

Window Overview

window overview defaults

window overview dialog

window overview on (default)

window overview off

window overview size [pixels] (default=200)

window overview optimize quality (default)

window overview optimize speed

window overview move upper left

window overview move upper right

window overview move lower left

window overview move lower right

(Select Active Window)

window activate [number]

Datapoints Menu

Datapoints Snap

```
snap dialog
snap defaults
snap grid on
snap grid off                                default
snap grid size [pixels]                    default = 100
snap grid size [in]inches
snap grid size [cm]cm
snap grid size [mm]mm
snap raster item on
snap raster item off                        default
snap raster item maximum distance [pixels] default = 100
snap raster item maximum distance [in]inches
snap raster item maximum distance [cm]cm
snap raster item maximum distance [mm]mm
snap raster item mode center                default
snap raster item mode edge
snap raster item maximum weight [pixels]   default = 10
snap raster item maximum weight [in]inches
snap raster item maximum weight [cm]cm
snap raster item maximum weight [mm]mm
```

Datapoints Mouse Keyins

```
mouse keyins dialog
mouse keyins defaults
mouse keyins dialog close
mouse defaults
mouse delta on
mouse delta off                            default
mouse units inches                         default
mouse units centimeters
mouse units pixels
mouse units millimeters
mouse left [x] [y] [view]                  default view number = 1
mouse move [x] [y] [view]                  default view number = 1
mouse right [x] [y] [view]                  default view number = 1
mouse set last move
```

Datapoints Zoom Points

```
zoom points dialog
zoom points defaults
zoom points enable on
zoom points enable off                      default
zoom points keyins on
zoom points keyins off                      default
zoom points window [number]                 default = 2
zoom points factor percent [value]         default = 400
```

Datapoints Crosshair Cursor

```
crosshair cursor on
crosshair cursor off          default
```

Datapoints Gridlines

```
datapoints gridlines on
datapoints gridlines off     default
```

Datapoints Place Fence

```
datapoints place fence
```

Datapoints Record

```
datapoints record point
datapoints record rectangle
datapoints record linestring
datapoints record polygon
datapoints record playback name [fname.scr]
datapoints record save name [fname.scr]
```

Help Menu

Help Contents

help
help dialog
help contents

Help Manual

help manual

Help About

help about

Miscellaneous keyins

Unlink

unlink [pathname]

DOS Shell

dos [keyin]

Windows Execute External Application

execute [application]

Wait for File

wait [pathname]

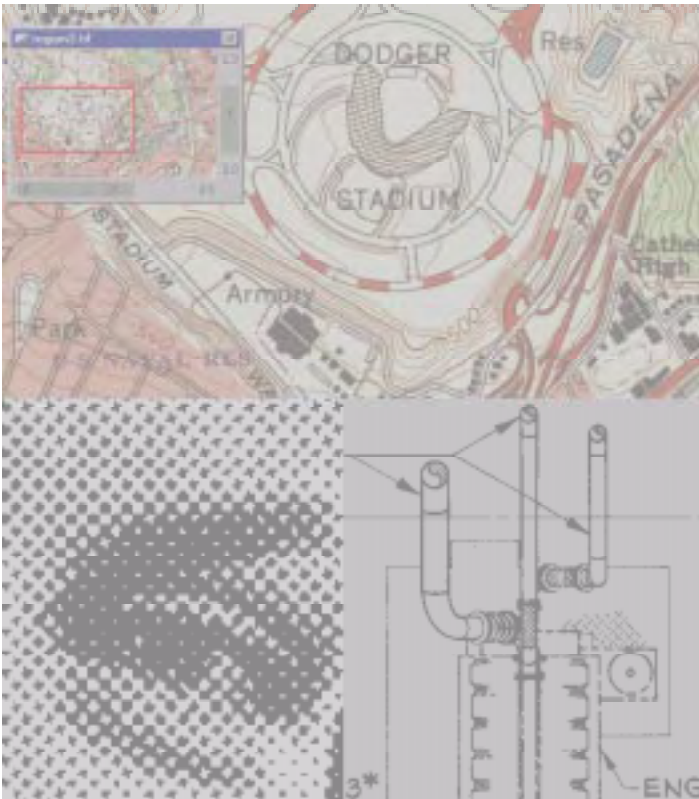
Write (append to text file)

write [filename] [ascii text]

Special Keywords

\$FILENAME	Path of raster file name
\$DPI	Pixel density
\$WIDTHPIXELS	Image width
\$HEIGHTPIXELS	Image height
\$SLO	Scan line orientation (0-7)
\$MEASUREPIXELX	X pixel location of mouse
\$MEASUREPIXELY	Y pixel location of mouse
\$MEASUREDISTANCE	Measured distance (pixels)
\$MEASUREANGLE	Measured angle (degrees)
\$MEASURERED	Red value of pixel
\$MEASUREGREEN	Green value of pixel
\$MEASUREBLUE	Blue value of pixel
\$MEASUREINDEX	Index in color palette
\$MEASUREGRAY	Grayscale value of pixel
\$MEASUREUNITSX	X location in default units
\$MEASUREUNITSY	Y location in default units
\$NEXTFILE	Next raster file in directory
\$PREVFILE	Previous raster file in directory

APPENDIX B



SCANSMITH PREDITOR

B. Command Line Options

You can enter command line options on the command line used to execute PREDITOR. You can modify the command line when the PREDITOR icon is highlighted by selecting File-Properties in Windows Program Manager, or by bringing up the File-Run dialog and entering the filename manually. (For Windows 95 and Windows NT, use the Run command in the Start menu, or create a shortcut to execute a command line option.)

Command lines are entered in the following form:

```
c:\anatech\preditor\preditor.exe [filename]
    [option] [option] ...
```

This section contains information on these command line options:

- Filename
- Format (-format)
- Run Script (-script)
- Skip Splash Screen (-nologo)
- Use Default Settings (-defaults)
- Read-only Mode (-readonly)
- Maximize (-maximize)
- Minimize (-minimize)
- Icon2 (-icon2)
- Disable TWAIN (-notwain)

Filename

The filename specifies a file to load upon startup. For example:

```
c:\anatech\preditor\preditor.exe myfile.tif
```

runs PREDITOR and loads the file myfile.tif.

Format

The optional format specifier lets you specify the input file format of the file referred to by the Filename. The format specifier is necessary for some file types that cannot be recognized by reading the file header or examining the filename extension. The syntax for the `-format` option is:

```
-format <type>
```

Example:

```
c:\anatech\preditor\preditor.exe  
myfile.xxx -format rlc
```

Here are the format type specifiers:

Type	Meaning	Type	Meaning
tif	TIFF formats	gtx2	GTX 4 Level 2
cal	CALS Type 1	gtx3	GTX 4 Level 3
cit	Intergraph CIT	rst1	Indigo RST 1
rle	Intergraph RLE	rst2	Indigo RST 2
tg4	Intergraph tg4	lrd	ANA Tech LRD
cot	Intergraph COT	g3	ANA Tech G3
t29	Intergraph T29	g4	ANA Tech G4
pcx	PCX	gif	GIF
hrf	Hitachi HRF	bmp	Windows BMP
rlc	Image Systems RLC		

Run Script

You can run a keyin script from the command line:

```
-script <filename>
```

Example:

```
c:\anatech\preditor\preditor.exe myfile.tif  
-script cmds.scr
```

The example above starts PREDITOR, loads the file myfile.tif, and runs the script file cmds.scr. This technique is useful to perform a specific set of cleanup operations on a series of data files generated by a scanner. You can set up a batch file that runs PREDITOR from the command line, calling the script that defines the cleanup operations, then exiting PREDITOR. Script file parameters are added to the command line using the `-p` option. Multiple `-p` options are used for each script parameter.

Skip Splash Screen

To skip the PREDITOR splash screen at startup, use the `-nologo` option.

```
-nologo
```

Example:

```
c:\anatech\preditor\preditor.exe -nologo
```

Creating the dummy file named preditor.nlg in the software installation directory is the same as specifying the `-nologo` option.

Use Default Settings

This option resets all PREDITOR settings to their defaults upon starting PREDITOR. This option is the same as selecting File-Preferences-Defaults.

```
-defaults
```

Example:

```
c:\anatech\preditor\preditor.exe -defaults
```

Note that whenever you use scripts to perform a set of operations, you may wish to set PREDITOR to its default settings before performing the operations, to avoid unexpected results due to previous changes in PREDITOR settings. You can use the `keyin` command to set defaults in the script, or you can use the

`-defaults` option in the command line that calls the script. For example:

```
c:\anatech\preditor\preditor.exe myfile.tif  
-script cmds.scr -defaults
```

The command above loads `myfile.tif` and executes the script `cmds.scr`. PREDITOR settings are reset to default settings *before* the script is executed.

Read-only Mode

You can run PREDITOR in read-only mode. In read-only mode, you can load files but you cannot save files. This prevents you from inadvertently overwriting valuable data files. To launch PREDITOR in read-only mode, use the `-readonly` option:

```
-readonly
```

Example:

```
c:\anatech\preditor\preditor.exe  
myfile.tif -readonly
```

Note that in the example above, PREDITOR runs in `readonly` mode and loads the file `myfile.tif`. Even if you subsequently close that file and load another file, you will still be in read-only mode for that PREDITOR session.

Creating the dummy file named `preditor.rdo` in the software installation directory is the same as specifying the `-readonly` option.

Maximize

You can run PREDITOR maximized, so that PREDITOR uses the entire window area when it starts. To launch PREDITOR in a maximized window, use the `-maximize` option:

```
-maximize
```

Minimize

You can run PREDITOR minimized, in icon mode. This is useful for working with script files in batch mode. To launch PREDITOR as a minimized icon, use the `-minimize` option:

```
-minimize
```

Icon2

This option turns off the display of text in the SCANSMITH PREDITOR toolbar. This may be useful for users running international versions of SCANSMITH PREDITOR. To turn off text in the toolbar, use the `-icon2` option:

```
-icon2
```



Standard toolbar with text



Toolbar in `-icon2` mode with no text

Creating the dummy file named `icon2.lst` in the software installation directory is the same as specifying the `-icon2` option.

Disable TWAIN

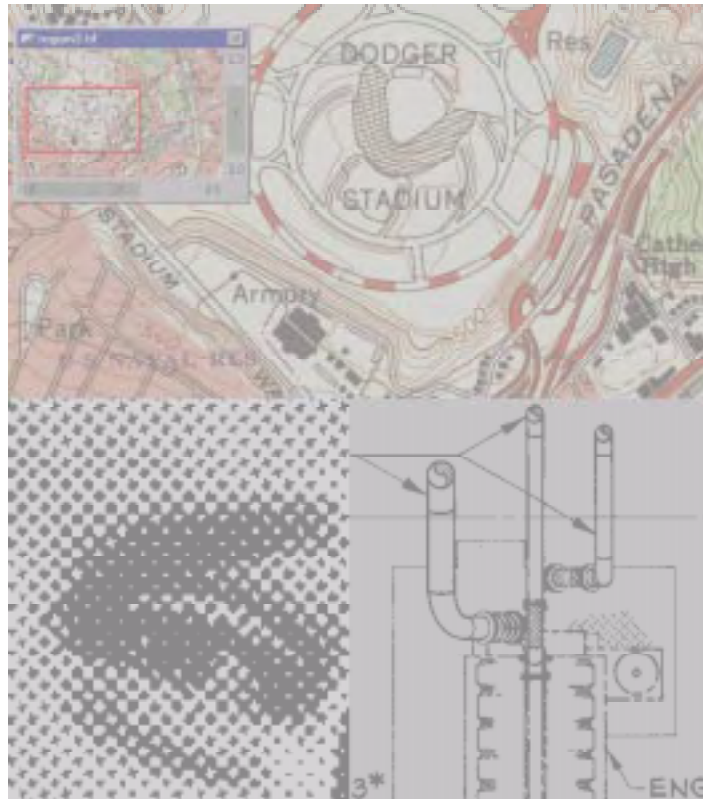
This option turns off the TWAIN interface capability. When TWAIN is disabled, selecting File-New SCAN will make PREDITOR launch SCANSMITH SCAN instead of the TWAIN interface, if SCANSMITH SCAN is installed on the system.

To disable the TWAIN interface, use the `-notwain` option:

```
-notwain
```

Note that you can also disable TWAIN by creating a dummy file (an empty text file) called **notwain.lst** in the SCANSMITH PREDITOR installation directory.

APPENDIX C



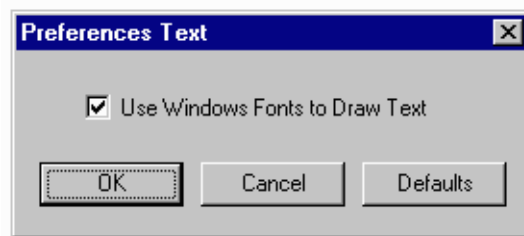
SCANSMITH PREDITOR

C. Non-Windows Fonts

The text fonts displayed below are used when Windows fonts are disabled.

Setup

1. To set up non-Windows fonts, pull down the File menu and select Preferences–Text.
2. The Preferences Text dialog appears. Uncheck the box *Use Windows Fonts to Draw Text*.



3. When you are ready to draw, pull down the Draw menu and select Text, or click on the Text icon in the toolbar.



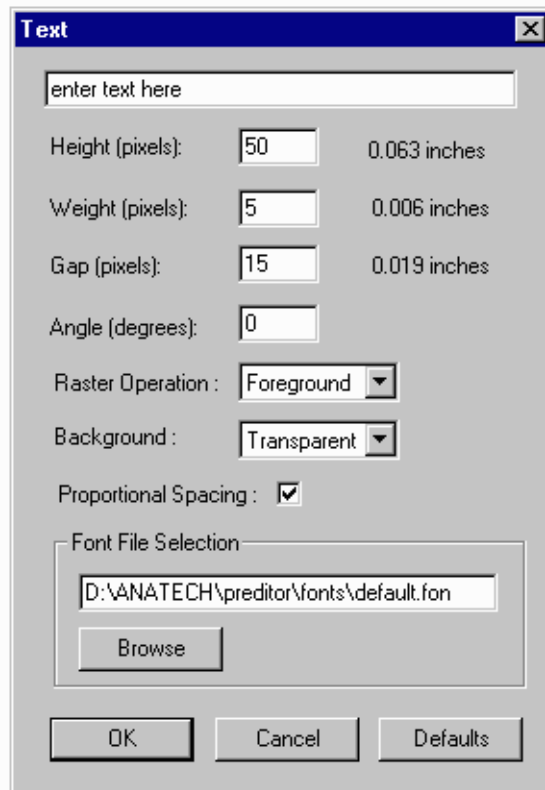
4. Position the cursor over the image and select a datapoint where you want the text to start. The datapoint specifies the lower left corner for the text. The following cursor appears when you select the datapoint to start the text:



5. Complete the Text dialog as needed. Enter the text in the text field, as shown. You can adjust the height, weight, gap (space between characters), and angle of the text. When proportional spacing is selected, smaller characters are spaced more closely together. Raster Operation specifies drawing in Foreground or Background, or Invert to invert existing data or Xhatch to draw using the current crosshatch pattern (see Draw-Xhatch). (The Image–Colors command defines the background and foreground colors for color or grayscale image files.)

The Opaque method erases the pixels underneath the text. The Transparent method does not alter the pixels underneath the text. Select a font from the list of available fonts (see illustrations that follow).

6. When ready, press OK. The text appears in the image.



Text Dialog for Non-Windows Fonts

Fonts

b_p.fon
Basic Plotter

A B C d e f 1 2 3 4

c_c.fon
Complex Cyrillic

А Б Э Д Й Ф 1 2 3 4

c_g.fon
Complex Greek

A B H δ ε φ 1 2 3 4

c_g_i.fon
Complex Greek Index

A B H δ ε φ 1 2 3 4

c_i.fon
Complex Index

A B C d e f 1 2 3 4

c_i_i.fon
Complex Italic Index

A B C d e f 1 2 3 4

c_r.fon
Complex Roman

A B C d e f 1 2 3 4

c_r_i.fon
Complex Roman Index

A B C d e f 1 2 3 4

c_s.fon
Complex Script

A B C d e f 1 2 3 4

ct_g.fon
Cartographic Greek

A B H Δ E Φ 1 2 3 4

ct_r.fon
Cartographic Roman

A B C D E F 1 2 3 4

d_r.fon
Duplex Roman

A B C d e f 1 2 3 4

ct_r.fon
Cartographic Roman

A B C D E F 1 2 3 4

d_r.fon
Duplex Roman

A B C d e f 1 2 3 4

default.fon
Simplex Roman

A B C d e f 1 2 3 4

g_e.fon
Gothic English

A B C d e f 1 2 3 4

g_g.fon
Gothic German

U B C b e f 1 2 3 4

g_i.fon
Gothic Italian

H B C d e f 1 2 3 4

s_g.fon
Simplex Greek

A B H δ ε φ 1 2 3 4

s_r.fon
Simplex Roman

A B C d e f 1 2 3 4

s_s.fon
Simplex Script

A B C d e f 1 2 3 4

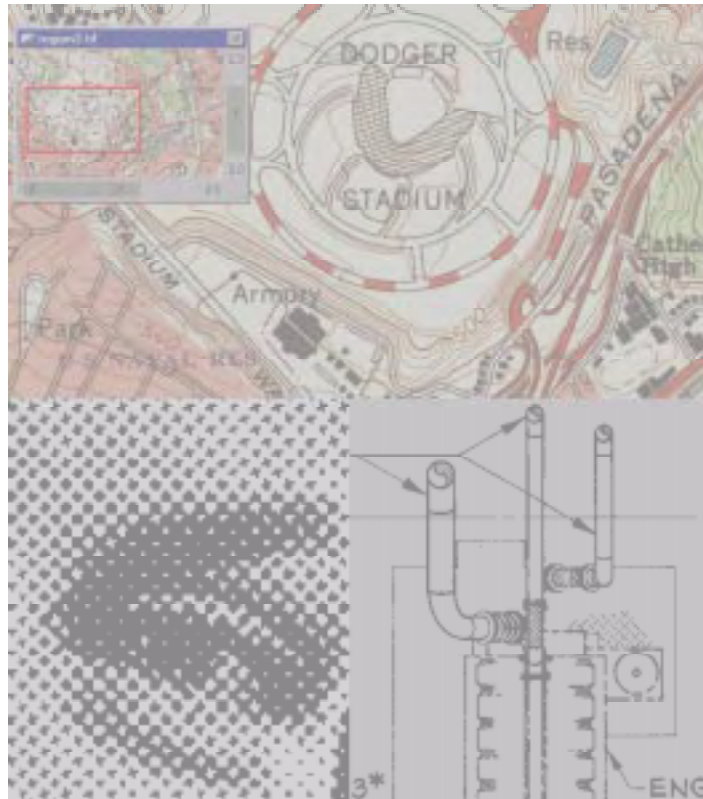
t_i.fon
Triplex Italic

A B C d e f 1 2 3 4

t_r.fon
Triplex Roman

A B C d e f 1 2 3 4

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