GIFConverter

for the Macintosh

This manual is for version 2.4.4 and up.

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When distributing GIFConverter, please give the complete contents of the disk, or the program archive and one of the documentation archives, making sure that you transfer all note files as well.

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Support

I offer support to my registered users on the GIFConverter program through any of the US Mail or electronic addresses listed on the cover. If you have a feature request, or if you find a bug in the program, do not hesitate to contact me. Or, use the reporting

From time to time, I will release new versions of GIFConverter and updated documentation. I distribute programs and documentation primarily through electronic channels; if you have already paid for GIFConverter, you may download new versions of the program and machine-readable documentation without further charge. Replacement disks and manuals are available for a fee plus shipping charges as stated in documentation accompanying the program. In general, it is cheaper to download new versions.

I primarily distribute GIFConverter at its web site at http://www.kamit.com/gifconverter/. Copies are also sometimes uploaded to America Online.

Acknowledgements

Table of Contents

About GIFConverter and GIF files

GIFConverter is a shareware graphics utility that enables you to work with raster images. These are the kinds of images you would use with a black and white or color paint application, or that you get from your scanner. Using GIFConverter, you can view these images, change their appearance, save them in nine different file formats, and print them.

GIFConverter was originally developed in response to a challenge by Larry Wood, administrator of the Graphics Support Forum on CompuServe. He was looking for somebody to develop an application for the Macintosh that supported GIF, the Graphics Interchange Format. ("GIF" is officially pronounced "JIF," like the peanut butter. "GIFConverter" has a hard "g" as in "gift" because I named it before I ever heard the word GIF spoken.) You can use GIF files on practically any computer, and for that reason you will see thousands of GIF files on BBSes and major online services like Compuserve, GEnie, and America Online.

Images
GIF Files themselves can contain one or more images, each with an associated color map. An image is one way a computer can represent a picture. Images are more like photographs than like line drawings. Line drawings are made up of mathematical elements like lines, circles, curves and polygons. An image is made up of a rectangular arrangement of points.

An example of an image, greatly magnified

Pixels
These points in the images are called pixels. "Pixel" is verbal shorthand for "picture element." The image is actually a rectangular array of pixels. Think of a sheet of graph paper. You can color each square on the graph paper so that each square is one color. If you stand back from the graph paper, you don't see the individual squares, you see the overall effect. On your computer screen, each pixel is 1/72" of an inch (or so) on a side. There are 5,184 pixels in every square inch of the screen. A 9" 512 x 342 pixel Macintosh screen has 21,888 pixels. A 13" 640 x 480 pixel Macintosh screen has 307,200 pixels.

Dots Per Inch
You may have a 300 dpi printer. The dpi stands for "dots per inch," and a dot is just another name for a pixel. These printers have 90,000 pixels per square inch.

Bits Per Pixel

GIFConverter can work with images that have up to eight bits per pixel. The number of bits per pixel determines how many separate colors the image can contain. Images in GIFConverter can contain up to 256 colors each (this is because $2^8=256$).

Color Maps and Color Tables

When images have 256 colors or less, they often use a color map or color table. This allows the images to use a specific set of 256 colors. A color monitor can really display 16,777,216 colors. That corresponds to 24 bits per pixel, but a 24-bit-per-pixel image takes three times as much memory as an 8-bit-per-pixel image. Also, working with 24-bit-per-pixel images is much slower.

The color map or table is simply a list of RGB colors. Each entry in the list has a color value for the red, green, and blue values that should be sent to your screen (hence RGB). Red, green, and blue are called the additive primaries because all colors can be represented as a mixture of red, green, and blue.

The computer then uses the value of each pixel in the image to look up the color in the table. If it finds a pixel that has the value 5, it looks at color #5 in the table, and sends that RGB value to the screen. Sometimes a color table used in this way is called a Color Look-Up Table or CLUT.

Color tables are often handy for making quick color adjustments for the image. Instead of changing the thousands of pixels in the image, a program like GIFConverter need change only the 256 color entries in the color table to get the desired effect.

Dithering and Halftoning

Dithering and halftoning are two ways to adapt an image to a particular set of colors. This set of colors can be more than just black and white. Both of them depend on the human eye's ability to blend details.

The most common use of halftoning is in the printing of photographs in newspapers and magazines. A photograph has a range of intensities, but a printing press has only two—either there is ink on the page or there is not. Halftoning converts a image into a field of spots. The size of each spot corresponds to the darkness[1] at that point. Light areas have small spots spaced a distance apart. Areas that are almost black have spots that grow together and touch. In the darkest areas, the white spaces between the spots disappear entirely.

On computers, we simulate the spots with groups of pixels. See the examples of halftoning methods in the section entitled *The Display.*

Dithering is another method of reducing the number of colors. In dithering, the computer chooses colors so that the average effect you see corresponds to the average color for an area of the image. Dithering does not have discernable spots like a halftone, but can sometime have other undesirable patterns.

Macintosh Displays

The original Macintosh screen had only one bit per pixel. It could only show two colors, black and white. Color Macintoshes can display two, four, or eight bits per pixel (4, 16 or 256 colors) with a color table. If you have the right hardware, your Macintosh may display what it calls thousands or millions of colors. These are 15 or 24 bits per pixel, but use RGB values directly instead of a color table.

Inside a GIF File

Now that we've defined some terms, we're ready to look at the organization of a GIF file:

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[1]Darkness is the inverse of intensity. We print with black inks on white paper, so darkness is appropriate here.

```
┌─────────────────────────────────┬─────────────────────────────┐
│ GIF File                        ┊  GIF89a only                │
│                                 ┊                             │
│      ┌───────────────────┐      ┊      ┌───────────────────┐  │
│      │ Background  Color │      ┊      │   Comment Text    │  │
│      └───────────────────┘      ┊      └───────────────────┘  │
│                                 ┊                             │
│   one or more images            ┊                             │
│   with color tables             ┊                             │
│                                 ┊                             │
│      ┌─────────────────┐        ┊                             │
│      │                 │        ┊                             │
│      │      Image      ┼──┐     ┊                             │
│      │                 │  │     ┊                             │
│      └─────────────────┘  │     ┊                             │
│                        ┌──┴──┐  ┊                             │
│                        │     │  ┊                             │
│                        └─────┘  ┊                             │
│                    Color  Table ┊                             │
│                        ┌─────┐  ┊                             │
│                        │     │  ┊                             │
│                        └─────┘  ┊                             │
└─────────────────────────────────┴─────────────────────────────┘
```
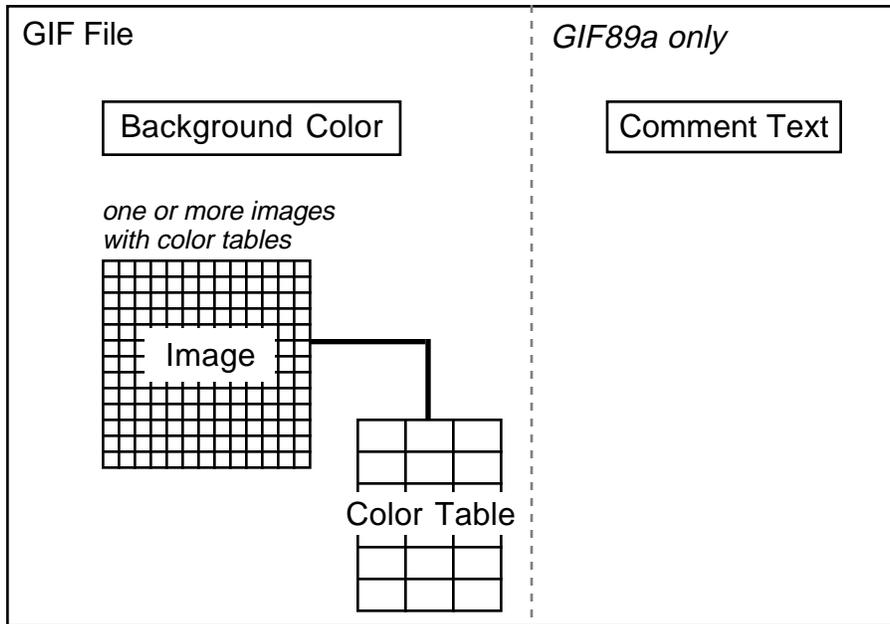
A GIF file can contain one or more images. Each image has a color table that defines up to 256 colors. The GIF file has a background color that's used to fill the spaces between images, if any.

The first GIF standard was called GIF87a. There is a new standard, GIF89a, which defines some extensions to the GIF file format. GIFConverter currently supports only the comment text extension to the GIF format.

A GIFConverter document in memory is organized the same way as a GIF file. The images appear in a window, and you can call up a separate window for the comment text.

Setting Up GIFConverter

System Requirements

GIFConverter requires the following system configuration:

Any Macintosh II or newer, including Quadra, Performa, PowerBook (140 or higher), Power Macintosh, or iMac computers.

System 7 or newer.

4Mb of RAM or more. Virtual memory is recommended if you have less than 8 Mb of RAM.

Installing GIFConverter

To install GIFConverter, just click on the installer icon, and follow the instructions.

License Key

When you pay for GIFConverter, you receive a key that looks like this:

01-23-45-67-89-AB-CD-EF

When you quit GIFConverter after copying it to your hard disk, you will receive a dialog box that stresses shareware registration and allows you to enter the key. Simply type in the key from the last line of the label and click on the **Enter Key** button. The key consists of numbers 0 through 9 and letters A through F. The hyphens are optional.

You will have to re-enter your key every time you copy the GIFConverter program to a different location. Entering the key will prevent the key dialog box from appearing every time you run GIFConverter. All functions in GIFConverter will always work.

Configuration File

GIFConverter creates a file called "GIFConverter Prefs". This file contains the settings from the Options dialog box as well as the settings for the individual file formats. GIFConverter keeps this file in the Preferences folder inside the System Folder.

Temporary Files

When GIFConverter runs short on memory, it creates files in the Temporary Items folder on the system disk to store some of the images it's working with. GIFConverter will never use more than half the free space on your disk, nor the last 100K of space.

These files are named with "GIFConverter" and a long number, such as "GIFConverter1308991488". Sometimes, if the Macintosh crashes while GIFConverter is running, these files may be left in the Temporary Items folder. You may drag these files to the trash, but make sure you quit from GIFConverter first.

Under System 7, the Temporary Items folder is invisible. When you boot your Macintosh, any temporary files left in the Temporary Items folder are moved to a folder in the Trash called "Rescued items from *disk name*." To discard these files, simply empty the trash in the Finder.

Working with Documents

Opening Documents

Choose the **Open…** command from the **File** menu. GIFConverter will list all the documents that it can open. Use the Open box the same as you would in any Macintosh program.

> **Note:** GIFConverter can't read Encapsulated PostScript (EPSF) files. To do so accurately requires a PostScript interpreter. There are some commercial products, such as TScript or Freedom of Press, that can read PostScript data and produce TIFF files.

Normally, Macintosh programs rely on information stored with the file to find out what kind of file it is. GIFConverter will tell you what type of file it is when you click on it.

Sometimes a downloaded file will not have the right type. GIFConverter can identify most files by their extensions (such as ".gif").

If a file doesn't show in the open box at all, try dropping the file on the GIFConverter icon. GIFConverter will examine the file, and if it is of a type that GIFConverter recognizes, it will open it.

Creating Documents

Choose the **New** command from the **File** menu to create a new document. When you save the document, GIFConverter will prompt you for the file's name and type.

New documents are handy when you want to make a file using the Clipboard. You can cut a picture from another program and paste it into the new window.

Saving Documents

To save your document., choose the **Save** command from the **File** menu. GIFConverter will save the document as the type shown in the status bar and the name shown in the window title. If you have never saved the document before, the Save command will behave as the Save As… command.

To save the document with a new name or type, choose the **Save As**… command. GIFConverter will give you the usual Save box with a suggested name based on the file type and display options. The shadowed box is a pop-up menu: Click on it to choose the type you wish to save the file as.

The **Save a Copy…** command works the same as the **Save As…** command, except that it does not change the window title or GIFConverter's idea of the file type.

Closing Documents

To close a document, click on the close box in the upper left corner of the window or choose the **Close** command from the **File** menu.

If you haven't saved the document since you last changed it, GIFConverter will ask you if you want to save the changes.

Discarding Changes

Choosing the **Revert** command from the **File** menu will cause GIFConverter to reread the document from the last file you saved it to. This may reduce the quality of what you see on the screen if you last saved the file in a format such as MacPaint, which doesn't store color.

> **Note:** You may not revert a document saved as EPSF.

The Display

Display Modes

You can control all the display modes through the **Display** menu.

Screen Depth

Choosing the **One Bit** command causes GIFConverter to use the old QuickDraw format for drawing to the screen and printing. This format allows up to eight colors. This is the only format allowed if your Macintosh doesn't have Color QuickDraw.

The **One Bit** command is also useful for making halftones for black-and-white printing.

The **Eight Bit** command, available if your Macintosh has Color QuickDraw, causes the display to use up to 256 colors or gray levels. The number of colors you can see on the screen depends on the Monitors settings in the Control Panel. For best results, use a color card capable of 256 colors or more, and set the Monitors Control Panel for 256 or more colors. Using less than 256 colors can result in a poor display with incorrect colors.

Color

Choosing **Cyan**, **Magenta**, **Yellow**, or **Black** displays one of the components of a four-color separation. A four-color separation is used in printing to create full color graphics. It uses four inks. Cyan, Magenta, and Yellow are used because they are what we call the subtractive primaries, colors that can be used to create any color on paper. The process also uses Black because it is hard to create accurate grays by mixing colored inks.

Choosing **Grayscale** displays the a gray version of the image, like watching a color television program on a black-and-white TV.

Choosing **Color** displays a color image. In One-Bit mode, GIFConverter creates a special format needed for color printing in this mode. On a Color QuickDraw Macintosh, the colors will display as they print on an ImageWriter II. On other Macintoshes, the display may be almost black, but GIFConverter will still print in color on the ImageWriter II.

Default Display Modes

The default modes are **Eight Bit** and **Color** if you can display more than two colors on your screen, otherwise **One Bit** and **Grayscale**.

Dithering Options

Dithering is a method used to represent grayscale or color images on a black and white screen. GIFConverter dithers when displaying these images in the **One Bit** display mode. Choosing **Automatic Dither** in the **Special** menu will redither the display automatically when necessary

after image processing or sizing changes. Otherwise, choose the **Recalculate** command from the **Image** menu to force redithering of the images.

Turning off automatic dithering can save some time when performing multiple changes, such as some image enhancement, display mode changes, and rotating an image.

The available dithering options appear on the **Dither** submenu under **Special.** These options are:

- **Ordered.** This is the traditional ordered dither method. This method works quickly, but results in X-shaped patterns.

- **Floyd-Steinburg.** This dithering method uses error diffusion. It looks good on the screen or on low-resolution dot-matrix printers like the ImageWriter.

- **Halftone 0°**. This method is actually a halftone; a fine distinction from dithering. The output from Halftone 0° is a 60 lines per inch spiral halftone similar to that found in newspapers. This halftone simulates dark spots corresponding in size to the darkness of the image at that point. The grid is at an angle of 0 degrees, parallel to the edges of the paper. This option works best when combined with the **Set Resolution** command and printed on a 300 dpi laser or ink-jet printer.

- **Halftone 53°**. This method produces a halftone similar to the Halftone 0° option, but wit h the grid rotated 53 degrees counterclockwise. The rotated grid of dots tends to cause less noticeable jaggedness around horizontal and vertical edges in the picture.

See the accompanying figures for examples of the dither methods.

Ordered

Floyd-Steinburg

Halftone 0°

Halftone 53°

Abijah

Page Breaks

Choosing the **Show Page Break**s option turns on the display of page breaks in the document. Page breaks show as striped lines, and are not printed.

Choose **Show Page Breaks** again to turn off the page break markers.

Display determines Save and Print style

GIFConverter always prints the image the way it shows on the screen. It also uses the screen display to determine how to save a PICT file. For instance, saving a PICT file with the display set to One Bit creates a PICT version 1 file, but settings of Eight Bit will create a PICT 2 file that can contain the color information.

For many other file formats, you have a choice of how many colors you want to save. See the individual file format descriptions for more information about what information GIFConverter saves with each format.

Window Features

Scrolling display area

The largest section of the window is taken up by the display area, which shows the images in the document. This area may be scrolled with the scroll bars or the hand tool.

Status bar

The status bar runs along the top of the window. This area displays the type and size (in pixels) of the current image.

When clicking on an image, the status bar shows the dimensions and number of colors in that image.

When stretching an image, it shows the size of the image and the percentage change.

Tool bin

The tool bin contains an icon for each of the three tools. Click on the desired tool to select it. You may also select tools by using the **Tools** menu, or the command-key equivalents.

Full-Screen Windows

The **Full Screen** command makes the frontmost window cover the whole screen. Choosing the **Full Screen** command again will return the window to its original size.

Hiding the Menu Bar

The **Hide Menu Bar** command will remove the menu bar from the screen, offering more viewing area. When the menu bar is gone, press ⌘-B to restore the menu bar.

The Editing Tools

Pointer Tool

You can use this tool for selecting, resizing and moving images. See the section on selecting images below for more information.

Marquee Tool

This tool marks an area in the document for use with the Copy or Crop commands.

Hand Tool

Use the hand tool to move the document around. Clicking inside the scrollable area with the hand tool scrolls the document without using the scroll bars. This is also handy when using the Full Screen mode.

Holding down the option key always causes the hand tool to appear regardless of what tool you have selected.

Color Tool

Use the color tool to browse the colors in the file. Simply click and drag the color tool over the images in a window to see what color is at a particular point.

When the color tool is active, the color window appears:

Selecting Images

Selecting Entire Images
To select an image, first choose the Pointer tool.

To select a single image, click inside the image. Selected images have thick diagonally-striped borders.

To add or remove images from the selection, hold down the Shift key and click on an image.

If you click outside of any image and then drag, you sweep out a rectangle with a dotted border. This rectangle selects any images it touches.

Selecting Portions of Images
To select portions of images, choose the Marquee tool. Click and drag the mouse, and a dotted rectangle will appear. This rectangle outlines the selected area. The size of the selection appears in the status bar.

After selecting portions of an image, you can use the **Copy** or **Crop** commands.

Using the Clipboard

Cut
The **Cut** command removes the selected images and places them on the clipboard. Areas selected with the marquee may not be Cut.

Copy

The **Copy** command places a copy of the selected images on the clipboard.

If you select an area with the marquee, then chose Copy, GIFConverter places the areas of images that fall within the marquee onto the clipboard.

Paste

The **Paste** command replaces the currently selected images with the images in the clipboard. If you haven't selected any images, GIFConverter places the images in the clipboard into the document with their top left at the last point where you last clicked the mouse.

Moving Images

To move images, first select the images you want to move as described above. Then, using the pointer tool, click inside one of the images, and drag the images to the new location. A dotted outline of the images will follow the cursor showing their new location. When you release the mouse button, the images will redisplay at their new location.

Alternatively, choose the **Location…** command on the **Image** menu, then set the location with the following dialog box.

```
                    Image Location

            Horizontal  0

            Vertical  0

            [ Cancel ]   [ OK ]
```
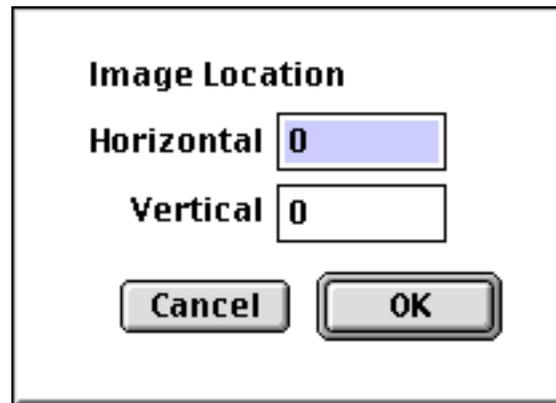
Stretching Images

To stretch images, click in the striped border of one if the images.

If you click near the center of an edge of the image, you will move that one edge in all the images.

If you click near the corner of an image, you move the corresponding corner of all images.

GIF Document: 144 x 152

Click here to drag in one direction

Click here to drag in either direction
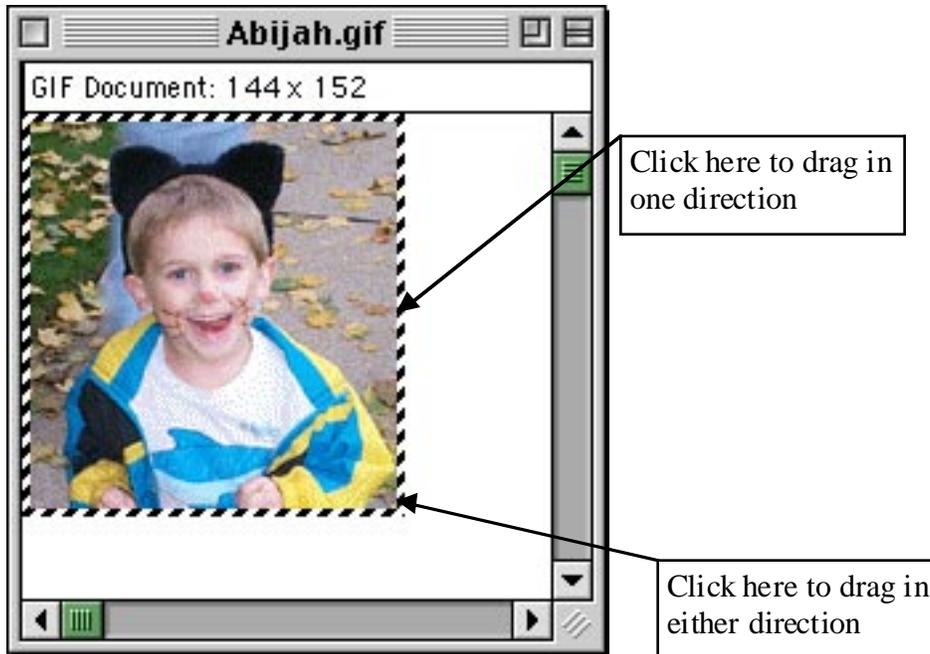
Holding down the shift key constrains the stretching to keep the proportions of the original images.

While stretching, the status bar shows the new size of the images in pixels and as a percentage.

Scaling Images

Scaling an image changes its size. This is like stretching, but you can enter the scaling percentage directly.

First select the images to scale by clicking on them with the pointer tool.

Then select the **Scale** command from the Image menu. You will see a dialog box that looks like this:

Scale Images

Vertical: 100 %

Horizontal: 100 %

Cancel   OK
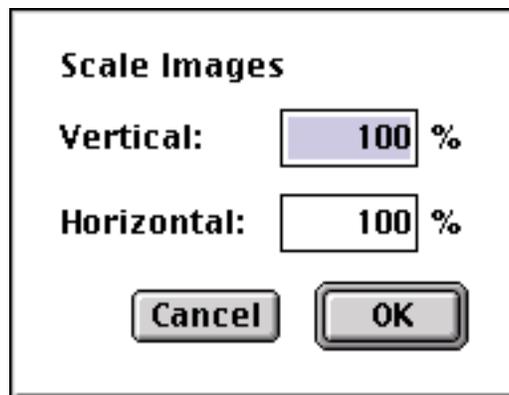
Type in the scaling factors as a percentage from 25% to 6400% in either direction, then click on the **OK** button. It is not necessary to scale by the same amount in each direction.

Sizing Images

Image Size

Width `640`

Height `480`

[Cancel] [**OK**]
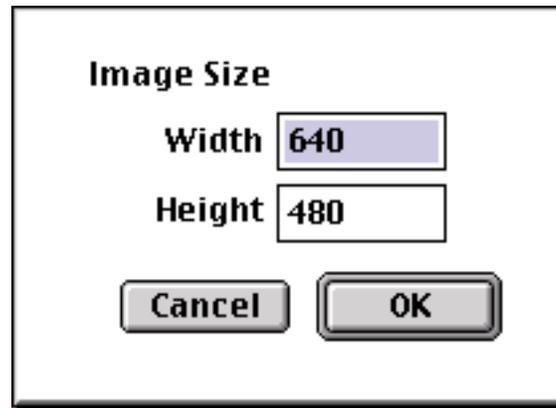
You can change the size of images exactly by choosing the **Size…** command from the **Image** menu. Just type in the size you wish.

Rotating Images

To rotate images, first select the images to rotate as described above.

Then, select the **Rotate** command from the Image menu. A submenu will appear; choose the rotation, which will be a multiple of 90°.

The selected images will rotate around their common center. After rotation in one-bit mode, GIFConverter will redither the images regardless of the automatic setting.

Cropping Images

To crop an image, use the marquee to enclose an area of the image, then choose the **Crop** command from the **Image** menu. Any image or portion of an image not enclosed by the marquee selection is removed.

GIFConverter automatically crops images when they are moved to the Clipboard if the Copy command is chosen after a marquee selection.

Changing the Resolution

You can also change the resolution of the document to match that of high-resolution printers. This results in smoother-looking output. Changing the resolution affects the *whole* document, including all the images contained in it.

You can optionally rescale the images to account for the new resolution. This makes the images keep their size after the resolution change. Otherwise, increasing the resolution would cause the images to print smaller.

Documents with increased resolution still display on the screen at 72 dots per inch (dpi). GIFConverter places the resolution information into PICT files and the clipboard, so you can paste high-resolution halftone images into other programs. Also, GIFConverter will print directly at the higher resolution.

Increased resolution works better with the Halftone dithering methods and 300 dpi (or greater) laser or ink-jet printers. It is not necessary to have a PostScript printer to take advantage of

halftones with this method. If you *do* have a PostScript printer, it is better to leave the document at 72 dots per inch since the printer does its own halftoning.

To change the resolution of the document, choose the **Set Resolution** command from the **Image** menu. You will see a dialog box that looks like this:

Choose the resolution you wish to use. Note that you use 288 dpi with 300 dpi printers; when printing on these printers, choosing the "Precision Bitmaps" option alters the scaling to account for this difference. Without "Precision Bitmaps," the images will print with horizontal bands running through them.

Make sure to check the "Also rescale images to new resolution" box if you want the images to stay the same size when printed. Otherwise, increasing the resolution causes the images to become proportionally smaller.

Changing the Color Palette

GIFConverter can change the color palette for an image or group of images. You may find changing the palette useful for making Startup Screens that display with the right colors, or custom icons for System 7, or for making GIF files with less colors that take up less space on the disk.

First, select the image or images you wish to change the palette for. Then, choose the **Change Color Palette…** command from the **Image** menu. You will see a dialog box that looks like this:

The shadowed rectangle is a pop-up menu. Click on it and choose a color palette. When you click on OK, GIFConverter will change the selected image or images to use the colors you chose. This may take a few minutes, and a progress box will appear to show how far the conversion has gone.

These are the color palettes available to you:

Palette	Contains
Apple Icon Colors	The 39 colors that Apple recommends for color icons in System 7.

Black and White	Just Black and White.
Imagewriter II Colors	The eight colors available from an ImageWriter II with a color ribbon.
RGB 8 Colors	The eight colors in the corners of the RGB color cube: Black, White, Red, Green, Blue, Cyan, Magenta, and Yellow. This is the smallest set of colors that will work with every picture without strange color effects.
Netscape Colors	The 216 colors that are common to Netscape and other browsers on all platforms.
Standard 16 Colors	The colors on the screen when you set the Monitors control panel to 16 colors.
Standard 16 Grays	The colors on the screen when you set the Monitors control panel to 16 grays.
Standard 256 Colors	The colors on the screen when you set the Monitors control panel to 256 colors.
Standard 256 Grays	The colors on the screen when you set the Monitors control panel to 256 grays.
Standard 4 Grays	The colors on the screen when you set the Monitors control panel to 4 grays.

When making a Startup Screen, use the Standard Colors or Grays that correspond to the Monitors control panel setting.

Reducing the Number of Colors

You can also reduce the number of colors in an image or set of images. When you reduce the number of colors, GIFConverter calculates which set of colors would work best with the images you've selected, and uses those colors to redither the images like the **Change Color Palette…** command.

First, select the image or images you wish to change the palette for. Then, choose the **Reduce Number of Colors…** command from the **Image** menu. You will see a dialog box that looks like this:

Reduce number of colors

Recolor images to use no more than [256] ⦿ colors ◯ grays

Cancel   OK
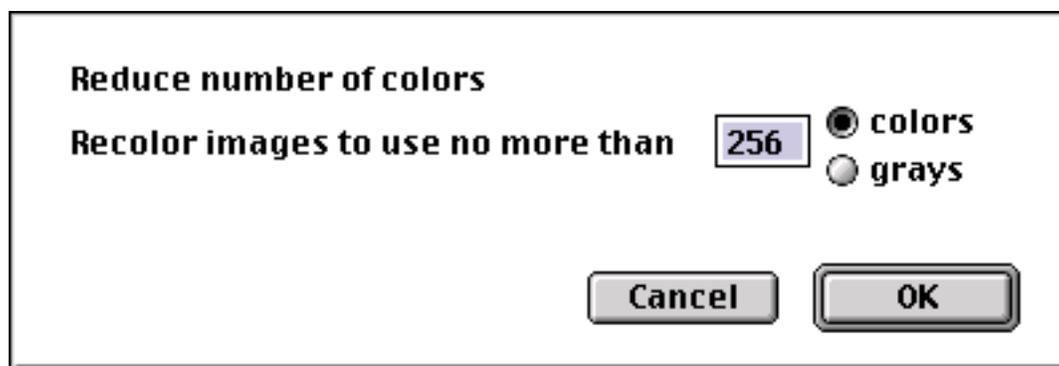
Type in the number of colors you wish to use, and choose between colors or grays. You can't reduce an image to less than 8 colors or 2 grays. When you click on OK, GIFConverter will

change the selected image or images to use the colors it has chosen for the images. This may take a few minutes, and a progress box will appear to show how far the conversion has gone.

Working with Comments

GIFConverter can store comments in GIF version 89a files. If you open a file that contains comments, they will appear in a window entitled "Comments for *filename*." You can see the comments window for a document or create new comments by choosing the **Show Comments** command from the **Windows** menu.

You can edit the comments using the **Cut**, **Copy** and **Paste** commands. You can also print them to any connected printer.

Undoing the Last Operation

Many operations are undoable. If the last command you chose is not undoable, GIFConverter will make the **Undo** command gray on the **Edit** menu.

Memory Usage

Choosing the **Show Memory** command from the **Windows** menu will produce a small window showing the amount of memory used.

RAM

The dark part of the RAM bar graph shows the proportion of available RAM GIFConverter is using to store the documents you're working on. The number to the right of the bar is the total amount of memory available in K (kilobytes). This figure does not include memory GIFConverter uses permanently, so it will always be less than the Multifinder memory setting.

Disk Image Buffers

When GIFConverter doesn't have enough memory to proceed, it will try to find enough memory to use by placing some of the images to the temporary file on the disk. Generally, GIFConverter needs to keep only images it is currently working on in memory. Effectively, the number of documents you can open is limited only by the amount of disk space you have available.

"Swapping" Cursors

GIFConverter indicates when it is placing data on the disk by changing the cursor to a special "swapping" cursor. This cursor indicates the flow of data into or out of the disk.

The dark part of the Disk bar graph shows the proportion of the available disk space GIFConverter is using. The number to the right of the bar is the total amount of disk space that GIFConverter *will use* in K (kilobytes). Remember, GIFConverter doesn't use more than half of the available disk space, nor the last 100K.

Enhancing Images

Image Processing Fundamentals

Image processing is a group of methods, all of which change the way an image looks. These techniques are useful in many ways. You can correct images that are too dark or too light, that lack contrast, or are washed out. You can also create special effects with image enhancement.

GIFConverter supports some image enhancements that fall into the category of *point processes.* These are effects that take place individually for each pixel (point) in the image. Changing the brightness is an example of a point process.

Stretching and rotation, mentioned earlier in this manual, are examples of a *geometric process.* A geometric process changes the position or arrangement of pixels in the image.

There are two kinds of processing that GIFConverter does not do: area and frame processing. An *area process* changes a pixel's value based on its own value and the value of neighboring pixels. One example of an area process is sharpening, which enhances edges. A *frame process* calculates a new image that is a combination of two previous images.

Currently, GIFConverter only allows image processing on images with 256 colors or less. To do image processing on full color images, see "Reducing the Number of Colors" on page 17 for more information

Gray Map

A *gray map* is a function that assigns a new intensity to a pixel based on that pixel's current intensity. A pixel of the lowest intensity is black, and a pixel of the highest intensity is white. A pixel of intermediate intensity may be gray or have a color. As a bright color is moved toward white or black, it loses saturation, or colorfulness.
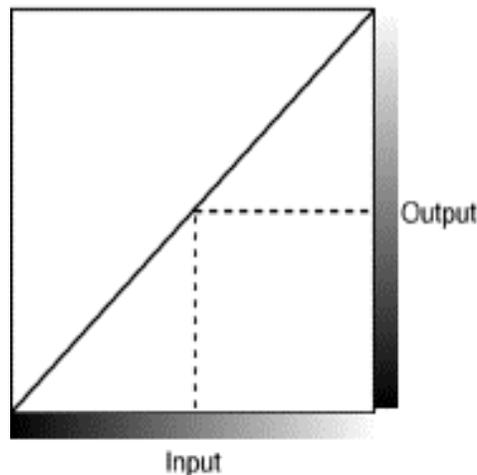
An example of a gray map.

The example above is a gray map that makes no changes to the image. For each intensity level on the input, the curve defines an output intensity level (dashed line).

Histogram

A *histogram* is a graph that shows how much of the image has a certain intensity. Here is an example of a histogram:
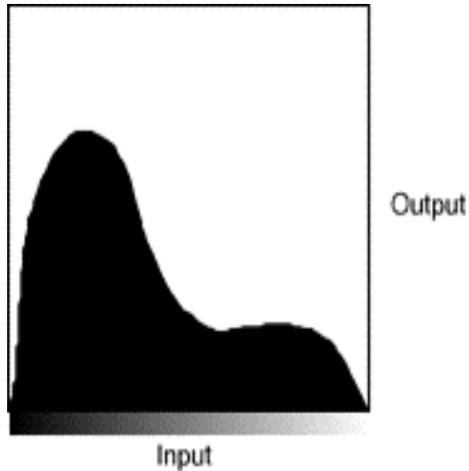
An Example Histogram.

The height of the histogram at any particular point shows the number of pixels or area of the image that has that intensity. The output side has no units. This is because the relative values are more important than any absolute value. In this case, the image is made up of mostly dark values.

Histogram Equalization

Histogram equalization is a technique that generates a gray map which changes the histogram of an image to be as close as possible to a user-specified desired histogram. This technique is useful for processing images that have little contrast. Typically, the desired histogram is a level one, meaning that all intensities are equally represented in the image. The net effect is to turn an image with details imperceptible to the eye into an image that is easily seen.

Gamma

Gamma is a measure of the nonlinearity of a monitor. This means that the RGB values we send to the monitor do not correspond to the intensity we see in a linear fashion. The intensity seen on a monitor can be specified as:

$$I=V^\gamma$$

I is the intensity seen on the screen, V is the value from the image, and γ is the gamma.

The Macintosh is set up so that the gamma is 1.4.

Here are gray maps representing a gamma less than one, and a gamma greater than one:

Gamma < 1   Gamma > 1
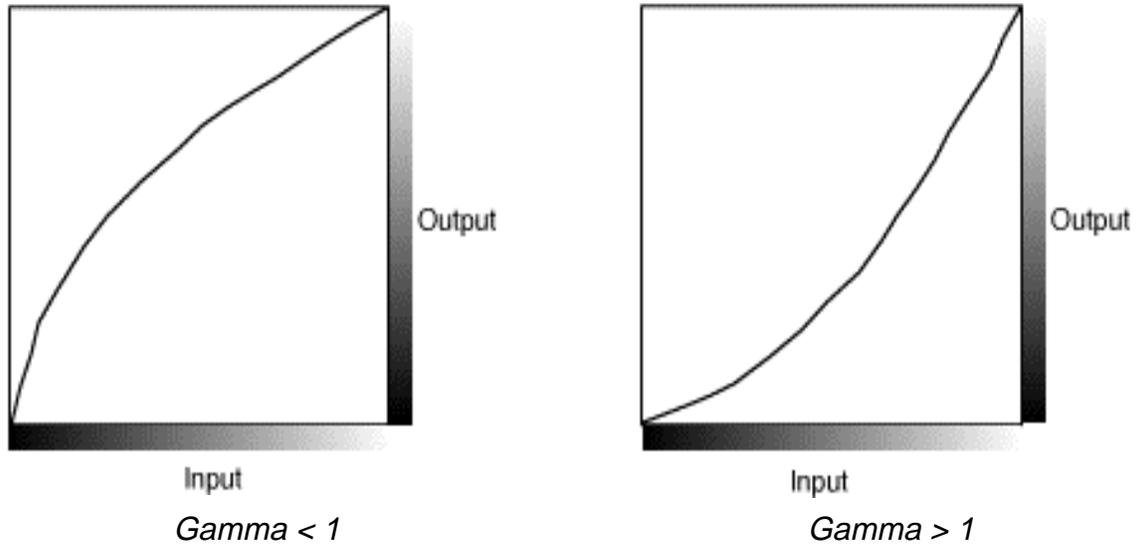
Some images may appear washed out. This is because the values in the image have been corrected for systems that have a gamma greater than 1.4. Most PCs used with common monitors have a system gamma of 2.2.

Image Processing in GIFConverter

GIFConverter's internal image processing apparatus looks like this:
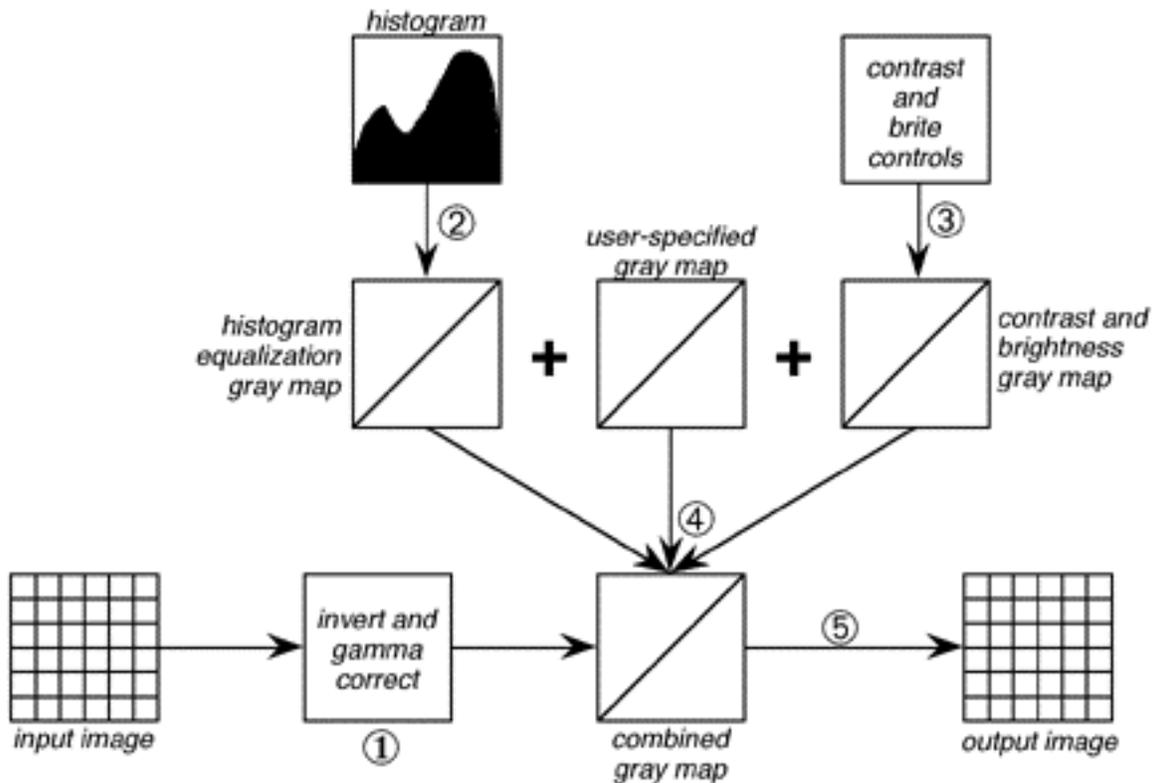
GIFConverter takes the following steps in applying image enhancement:

1. The image is inverted and gamma-corrected if specified.

2. The histogram for the image is compared to the desired histogram, resulting in the histogram equalization gray map. If histogram equalization is turned off, this gray map becomes the identity gray map, and makes no changes to the image.

3. GIFConverter generates a gray map for the contrast and brightness based on the contrast and brightness controls.

4. The histogram gray map, user-specified gray map, and contrast-and-brightness gray map are combined into a single gray map to be applied to the image.

5. The combined gray map is applied to the image to produce the finished result.

The Image Enhancement Dialog

You are able to invoke all the image enhancement features through the **Enhance**… command on the **Image** menu, which produces the following dialog box.
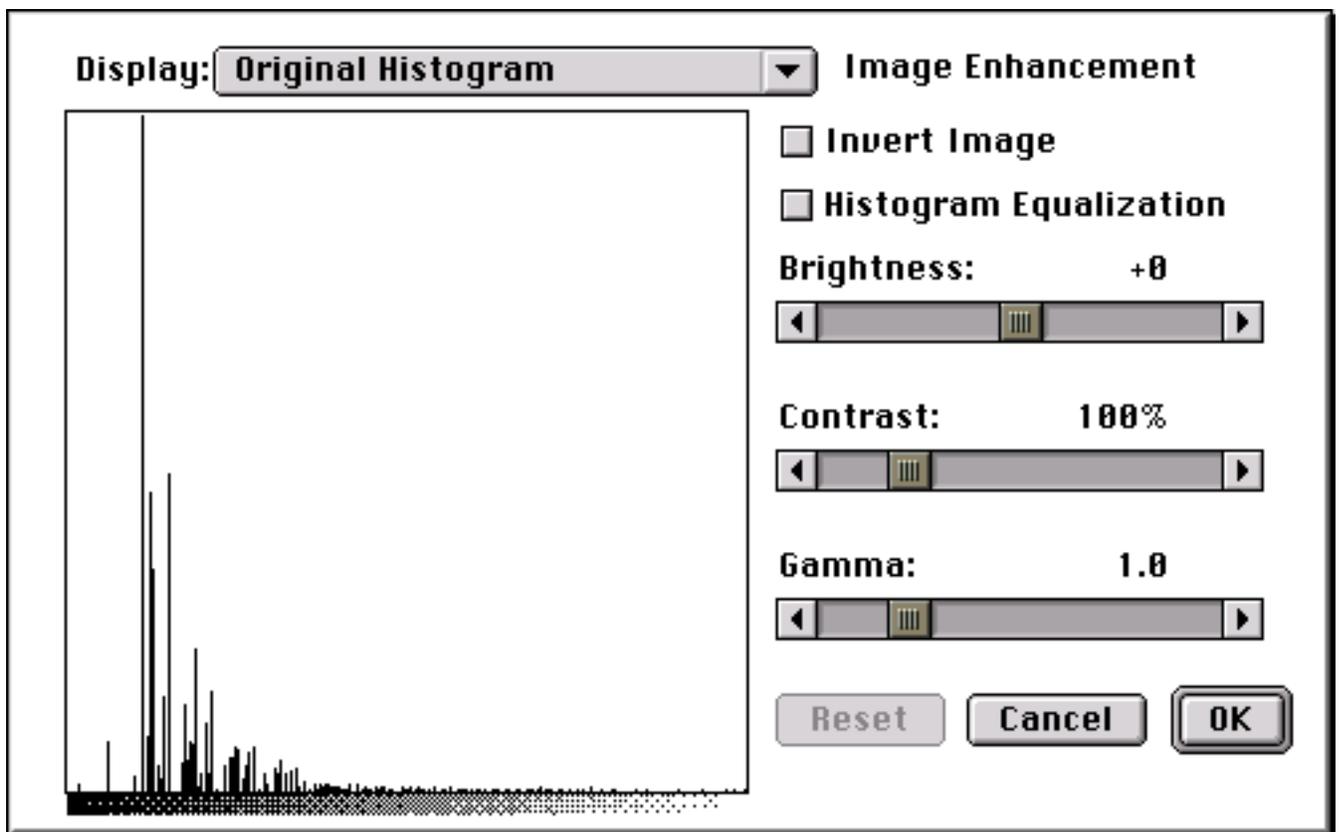
To enhance images, first select the images with the pointer tool. Image enhancement does not work on portions of images. You can only enhance entire images.

The Enhance dialog box consists of two main areas:

The Display shows data at a specific point in the image enhancement process described in the previous section. When viewing the **Desired Histogram** or **User-Specified Gray Map** modes, clicking and dragging in the display changes the histogram or gray map.

To the right of the display are several controls that change the way GIFConverter displays an image.

When you click on the **OK** button in the Enhance dialog box, GIFConverter applies the settings to all the images that you selected.

The Display
The large area at the left of the dialog box is the display area. Above the display is the Display menu. This menu selects the data that shows in the display area.

Click on the display menu to choose among the options:

- **Original Histogram**. This display contains the histogram of the original image data.

- **Desired Histogram**. This display shows the desired histogram. You can change the histogram as described below.

- **Histogram EQ Gray Map**. This display shows the gray map resulting from the application of Histogram Equalization.

- **User-Specified Gray Map**. This display shows a gray map that you may modify to manually alter the intensity of the image.

- **Contrast & Brightness Gray Map**. This display shows the gray map that results from setting the Contrast and Brightness controls.

- **Combined Gray Map**. This display shows the gray map resulting from combining the histogram equalization gray map, the user-specified gray map, and the contrast and brightness gray map.

- **Final Histogram**. This display shows the effects of applying the combined gray map to the images being enhanced.

Gamma Correction
The **Gamma** slider allows you to change the input characteristics of GIFConverter's image display system. When viewing a washed out image, adjust the gamma to a value in the range of 1.5 to 2.2.

Inverting the Image
Sometimes, when GIFConverter reads an image, it comes out negative. Some TIFF files do not contain an explicit specification of how to represent black and white values. GIFConverter makes an assumption about this representation according to the TIFF specifications, but images from some programs still appear inverted.

Check the **Invert Image** button in the dialog box to cause GIFConverter to reverse the image values. This will create a negative of the image, which will correct for images that start as negatives.

Histogram Equalization
Histogram Equalization is a technique for increasing the detail of an image that is lacking in contrast. This technique changes the intensity levels in the image to cause the image to conform to some desired histogram. Histogram Equalization helps the quality of dithered images in the One Bit mode. Sometimes, this technique increases the contrast too much.

To turn this feature on, check the **Histogram Equalization** check box.

The default histogram contains equal amounts at all intensities. To change the histogram, select **Desired Histogram** from the **Display** menu in the dialog box. Then draw the desired histogram into the display box with the mouse. Press the **Reset** button to return to the default histogram.

Contrast and Brightness Control

The **Contrast** and **Brightness** controls operate similarly to the controls on a TV set.

The Contrast control is measured as a percentage. 100% corresponds to normal contrast; lower values indicate less contrast and higher values indicate more contrast. The contrast can be adjusted from 25% to 400%.

The Brightness setting is an intensity value that is added to all values in the image.

User-Specified Gray Map

The user-specified gray map offers the opportunity to apply unusual changes to the image.

To alter this gray map, select **User-Specified Gray Map** from the **Display** menu in the dialog box. Draw the desired gray map into the display area. Click on the **Reset** button to restore the default gray map.

Image Enhancement Methods

If…	Then try…
You got the images from another computer (not a Macintosh), and they are washed out.	Increasing the **Gamma** to a value of 1.5 to 2.2.
The image is a negative. Areas that should be dark are light, or vice versa.	Clicking on the **Invert Image** button.
The image appears to be all one intensity. Details can hardly be seen	Turning on **Histogram Equalization**.
The image is too bright or too dark.	Adjusting the **Brightness** control.
The image needs more or less contrast.	Adjusting the **Contrast** control.
You want to experiment with special effects.	Changing the **User-Specified Gray Map**.

Deferred Updates

When you turn off **Automatic Dithering**, you will not see your changes immediately. After performing an image enhancement, choose the **Recalculate** command from the **Image** menu to update the screen.

GIF Animation

General Instructions

GIFConverter's multiple image feature supports GIF animation. The images are presented in the order that they appear on the screen, with deeply buried images showing up first, and the image in front of them showing up in order. GIFConverter will have better depth editing features in the future. For now, the best way to bring an image to the top is to cut and paste it.

Each image has associated with it a number of parameters that affect how it is handled. These are listed below.

To change these parameters:

1. Click on the image or images you want to change.

2. Select one of the following items from the Image menu.

3. Preview the changes you've made by selecting the Display in http browser… command from the **File** menu.

Disposal Method

The **Disposal Method** submenu on the **Image** menu allows you to specify one of the following four choices for when an image has had its time on the screen:

- **Unspecified:** The method is up to the browser.

- **None:** Leave the image on the screen.

- **Dispose to Background:** Replace the image with the background.

- **Dispose to Previous:** Remove the image so that it shows what was previously shown (as if it hadn't been there).

Delay

Choose the **Delay…** command on the **Image** menu to specify the amount of time the selected image(s) should appear on the screen, or **None** for no delay.
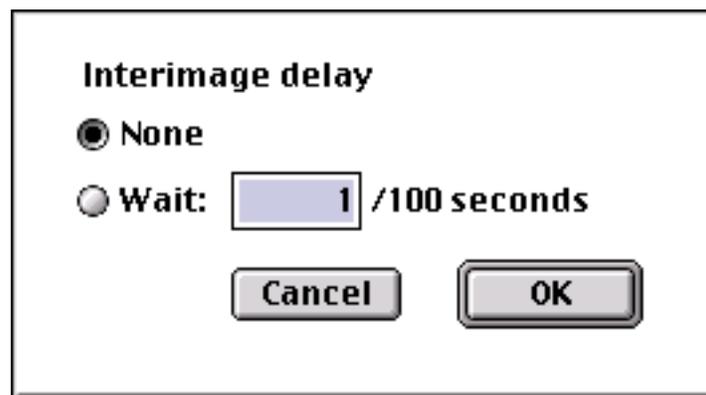
User Input

If the **User Input** item on the **Image** menu is checked, the displaying application is supposed to wait for the user to press a key or click a button before continuing.

Netscape Loop Count

Netscape Navigator extended the GIF specification with a way to add a loop count to an animation. To set this loop count, choose **Netscape Loop Count…** from the **Image** menu, then choose None, Infinite, or type in a number of loops.

Loop Count

◉ None

○ Infinite

○ Loop: [1] times

[Cancel] [OK]

Transparent Colors

Color

Document: Abijah.gif

Index: 64

Color: 234, 202, 209

[Make Transparent Color]

[Remove Transparency]
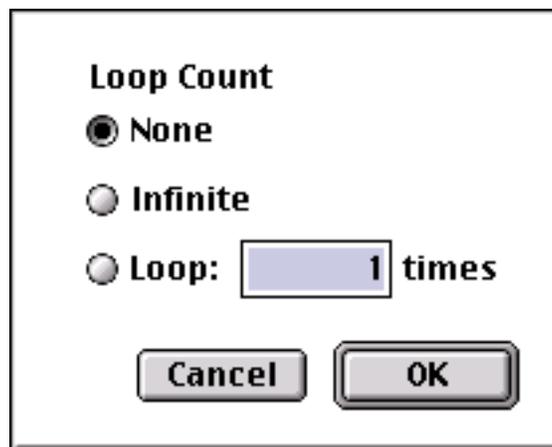
To set the transparent colors of an image, click on the Color Tool, then click or drag on an image until you find the color you want to make transparent. Click on the **Make Transparent Color** button to make that the transparent color, or on **Remove Transparency** to remove the transparency.

Previewing in a browser

To preview in a browser, select the **Display in http Browser…** command from the **File** menu. You can use the **Set http Helper** command to choose which browser to use.

Printing Documents

To print a document, choose the **Print…** command from the **File** menu.

The **Page Setup…** command allows access to orientation and page size parameters.

For faster printing, use the **Print One** command from the **File** menu. This command uses the last settings chosen in the **Print…** command, or the default settings if no document has yet been printed.

What you see is what you print

When printing with GIFConverter, remember that GIFConverter always uses the current Display settings to determine which information to send to the printer.

Print Margins

GIFConverter allows you to set the print margins it uses for printing. The default print margins are 1 inch at each edge of the document. To change the print margins, choose **Print Margins…** from the **File** menu. You will see a dialog box that looks like this:

Print Margins

Top: `72 pt`   Left: `72 pt`

Bottom: `72 pt`   Right: `72 pt`

Units
- ● points
- ○ cm
- ○ inches

[Cancel]   [OK]
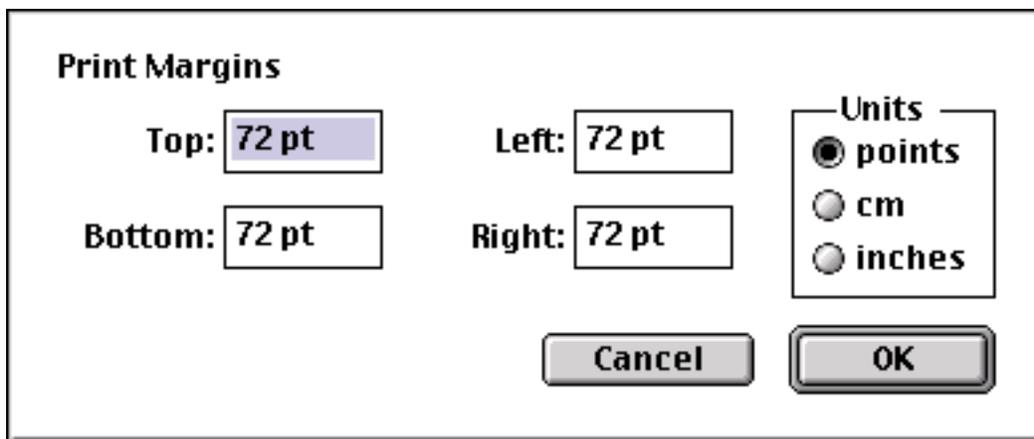
You can type the margins for each edge of the page into the corresponding area in the dialog box. Click on a **Units** button to change the units in use. You can also specify units by following your measurements by pt (for points), cm (for centimeters), or in (for inches).

When you click OK, GIFConverter uses the print margins you've set for the document.

ImageWriter

Images print best on the ImageWriter if you select **One Bit** mode.

Eight-Color printing

To print color images on the ImageWriter II, follow these steps in this exact order:

1. Turn the printer off.

2. Install a color ribbon according to the instructions in the owner's manual.

3. Now, turn the printer on. Installing the ribbon with the printer on may cause the ImageWriter to mis-identify the ribbon type.

4. Choose the **One Bit** and **Color** options in the **Display** menu.

5. Choose the **Page Setup…** and **Print…** commands to print the document.

Some large documents run into a memory limitation in the ImageWriter printer driver. When this happens, your printer will give you blank pages. To correct for this, you may have to choose the 2 x 11" Pages option in the **Page Setup…** dialog box. If you do so, also choose **No Gaps Between Pages**.

GIFConverter applies a color correction to the color data to compensate for the inks used in a typical four-color ribbon. The color printing process is inexact, and results may vary according to the type of paper used, and the manufacturer and age of the ribbon.

LaserWriters and other PostScript Printers

If the chosen printer driver is LaserWriter, GIFConverter generates PostScript halftones to represent the screen data. It is not necessary to use halftone patterns or increased resolution to print on these printers.

If you choose the **Grayscale** or **Color** options, GIFConverter sends PostScript data to create a Grayscale image. GIFConverter does not currently support the *colorimage* PostScript operator.

If you choose one of the color separations, Cyan, Magenta, Yellow, or Black, GIFConverter generates a halftone image representing the color component.

LaserWriter 6.0 Supports Color Printers

When printing with LaserWriter 6.0 (or newer) and Color QuickDraw, GIFConverter does not generate the halftones itself. Instead, it sends the displayed picture directly to the printer, and prints it using the default screen angles configured into the printer. When using LaserWriter 6.0, make sure to turn on the **Color/Grayscale** printing option, otherwise the images will print incorrectly.

LaserWriter 6.0 supports PostScript printers that directly generate full-color images.

High-Resolution QuickDraw Printers

GIFConverter can also print on High-Resolution QuickDraw printers. These are laser or ink-jet printers that use the Macintosh to do the actual drawing, rather than accepting PostScript data. When printing on these printers, choose the **Precision Bitmaps** option in the **Page Setup** dialog box if supplied; otherwise, printing bitmapped images from GIFConverter will result in striped patterns in the images. Some printers, like the StyleWriter, do not need Precision Bitmaps.

Printing halftone images

The following resolutions are available:

Printer	Resolution
ImageWriter	72 dpi
ImageWriter II	144 dpi
LaserWriter, DeskWriter, and most other laser and inkjet printers	288 dpi

StyleWriter   360 dpi

Here's what you have to do to print halftone images, assuming you have a QuickDraw printer that has at least 300 dpi output (lower resolution doesn't work as well):

1. Set the Display menu to **One Bit** and **Grayscale**

2. Choose one of the halftone dithering methods from the **Dither** submenu on the **Special** menu.

3. Choose the **Set Resolution** command from the **Image** menu. Pick an appropriate resolution, with image rescaling turned on.

4. If GIFConverter does not automatically redither the image because you have **Automatic Redither** turned off, choose the **Recalculate** command from the **Image** menu. The display on the screen should contain blobs of various sizes. This is the halftone image.

5. Choose **Page Setup**. Make sure the **Precision Bitmaps** option is on, if there is one for the printer you're using.

6. Choose **Print** and print in the normal fashion.

Third-Party Printers

GIFConverter is compatible with third-party printers that use special drivers. When printing to these printers, GIFConverter sends the contents of the screen onto the printer according to the current Display settings.

Color printing on third-party printers requires Color QuickDraw.

Setting Options

Choose the **Options…** command from the **Special** menu. The following dialog box will appear:

☑ **Remove Unused Colors**
☑ **Allow Backgrounding (Multifinder)**

[Cancel]   [OK]

Remove Unused Colors

If this box is checked, GIFConverter will automatically scan images for unused color entries in their color maps when it opens them. GIFConverter then removes unused colors. The calculations required for removing unused colors takes quite some time. Uncheck this box to gain some speed when loading GIF files.

Allow Backgrounding (MultiFinder)

If you check this box, GIFConverter allows other programs to run in the background when the "Juggler" cursor is visible. Unchecking this box may speed up some operations like dithering or reading a file when using MultiFinder.

File Settings

Under the **File Settings** menu on the **Special** menu, there is a submenu with an entry for each file type. Use these menus to call up the dialog boxes for the settings for each individual file type. See the section on Supported File Formats for more information for each individual format.

When saving a file to a format that has settings, GIFConverter will ask you for the settings to use.

Internet Config

Use the **Internet Config** command on the **Special** menu to start the Internet Config program. Use this program to set the way your computer interacts with the Internet.

GIFConverter uses the helper settings for "http" to find a web browser to use for previewing graphics, and for displaying help.

For more information, see the Internet Config product page at http://www.stairways.com/ic/ or the official Internet Config page at http://www.quinn.echidna.id.au/Quinn/Config/.

Set http Helper

The **Set http Helper** convenience command on the **Special** menu will start the Internet Config program and automatically brings up the dialog to set the http helper.

Working with Slide Shows

Creating a Slide Show Document

To create a Slide Show Document, choose the **New Slide Show** command from the **File** menu.

Adding Files

To add files, choose the **Add…** command from the **Show** menu. You will get a window that allows you to open multiple files.
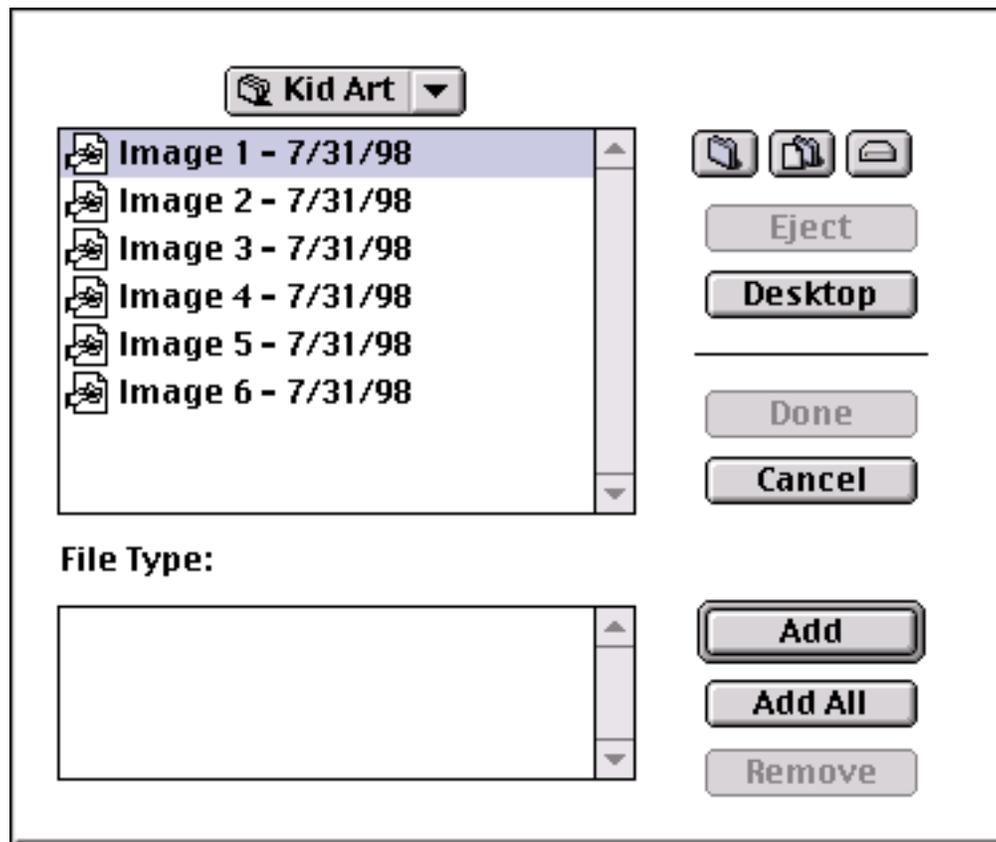
The list at the bottom holds the files you've selected. To add a file, click on it, then click on **Add**. To add all the files in the folder, click on **Add All**. When you are finished, click on **Done**.

The document window will then look like this:
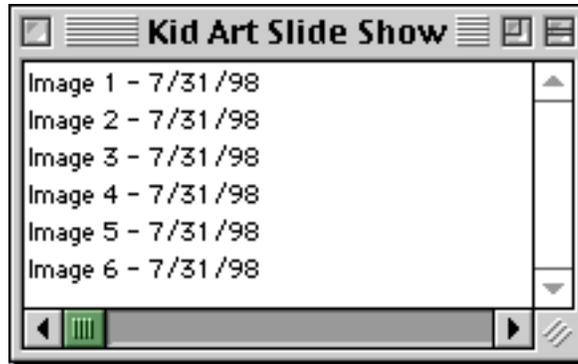
Selecting
To select files in the document, click on them. Holding down the Shift key and clicking will choose all the files between the one originally clicked and the one newly clicked. Holding down the Command key will allow individual files to be selected or unselected.

Deleting Files
To delete files, select them and use the **Clear** command on the **Edit** menu, or press the Backspace key.

Moving Files
To change the order of files in the slide show, select a group of files, then use one of the **Move…** commands on the Show menu, or the arrow keys on the keyboard, to move them up or down.

Saving and Opening Slide Shows
You can use the commands on the **File** menu to open and save slide shows.

Opening files through a Slide Show
To open files through the Slide Show window, choose the files you want to open, then choose the **Open Selected…** command from the **Show** menu.

Playing a Side Show
To run the slide show, choose the **Play** command from the **Show** menu. To make the show run in a continuous loop, choose the **Loop** command from the show menu.

Stopping the Show
To stop the Slide Show if it is in a loop, or before it finishes, hold down the Command key and press the period key (.).

Skipping to the Next Slide
To skip to the next slide before the time runs out, press a key on the keyboard, or click the mouse.

Changing the Time Between Slides
Choose the **Show Options…** command from the **Show** menu, and type in the number of seconds within slides, then click on OK.

Delay between slides: 5 seconds

Cancel   OK

Using AppleScript and AppleEvents

Scripting Support
GIFConverter is AppleScript Scriptable, Recordable, and Attachable.

- **Scriptable:** Many of GIFConverter's actions can be

- **Recordable:** When recording is on, GIFConverter's actions will record into a script.

- **Attachable:** This is a pretty esoteric form of scripting where scripts can intercept standard events and perform additional actions.

The Scripts Menu
Any AppleScript placed into the Scripts Menu folder will be added to the Scripts menu. This allows GIFConverter to be extended with actions that interface to MacOS in interesting ways. For instance, there is an example that sets the desktop picture.

Conversion Scripts
The Scripting folder contains the following scripts:

- Convert To GIF

- Convert To JPEG

- Convert To PICT

- Convert To PNG

To use these scripts, simply drop files onto them; GIFConverter will perform the indicated conversion and place the output in a folder of your choice.

Frontier
In the Scripting folder, there is a Frontier folder with glue code for Userland Frontier.

Working with Other Applications

Interacting with MacOS

Choosing Memory Size

GIFConverter comes preconfigured to run with approximately 2Mb of memory under MacOS. Even though GIFConverter stores data on the disk when necessary, it must have enough memory to store the images it's actively working on. This might be one image it's drawing on the screen, or two or more images when performing more complex operations.

GIFConverter will use system memory when available. To give GIFConverter more breathing room, quit other applications.

In extreme cases, try allocating more memory to GIFConverter. To do this, quit GIFConverter, then find the GIFConverter icon in the Finder. Click on it, and select **Get Info** from the **File** menu. Type the new size into the box marked Current). Then close the Info window.

Running GIFConverter in background

"Juggler" Cursor

When the "Juggler" cursor appears, GIFConverter is performing an operation that may take a long time to complete. GIFConverter can run in the background if you're using Multifinder. You can click on other windows and work with other applications or use the Finder.

When the possibly lengthy operation is complete, GIFConverter will beep and a small version of the GIFConverter icon will flash over the application. Then you can use either menu to go back to GIFConverter to continue working.

Using the Clipboard

GIFConverter places images on the Clipboard according to the Display settings in effect when the **Cut** or **Copy** commands were selected. If you select the **Eight Bit** mode is, the clipboard will contain a PICT2 image.

Some applications will work better with **One Bit** or **Grayscale** settings.

To paste high-resolution halftone images into other applications, such as word processors or page layout programs, follow these steps:

1. Set the Display menu to **One Bit** and **Grayscale**

2. Choose one of the halftone dithering methods from the Dither submenu on the Special menu.

3. Choose the Set Resolution command from the Image menu. Pick an appropriate resolution, with image rescaling turned on.

4. If GIFConverter does not automatically redither the image because you have **Automatic Recalculation** turned off, choose the **Recalculate** command from the **Image** menu. The display on the screen should contain blobs of various sizes. This is the halftone image.

5. Click on the images you wish to copy with the pointer tool.

6. Use the **Copy** command to copy the images to the clipboard.

7. Switch over to the other application and paste the images. Before printing from that application, choose **Page Setup**. Make sure the **Precision Bitmaps** option is on, if there is one for the printer you're using.

Using halftone images with QuickDraw printers

If you have a high-resolution QuickDraw printer, you can use the following method to place halftone image into documents using a word processor or other application that accepts graphics from the clipboard:

1. Open a file with GIFConverter.

2. Select the area you wish to use as a graphic and invoke the **Crop** command. Use the pointer tool to push the image into the upper left hand corner of the document. You may also resize or rotate the image, but the point is to get the size you want and have it in the upper left hand corner.

3. Make sure to set the Display menu to **One Bit** and **Grayscale**

4. Choose one of the halftone dithering methods from the **Dither** submenu on the **Special** menu.

5. Choose the **Set Resolution** command from the **Image** menu. Set it to a resolution of 288 dpi, with image rescaling turned on.

6. If GIFConverter does not automatically redither the image because **Automatic Recalculation** is off, choose the **Recalculate** command from the **Image** menu. The display on the screen should contain blobs of various sizes. This is the halftone image.

7. Choose **Select All** from the **Edit** menu.

8. Choose **Copy** from the **Edit** menu.

9. Switch to the other application.

10. Select the location to place the image, then choose **Paste** from the **Edit** menu.

Transferring files on the Internet

Macintosh communication programs generally use a format called MacBinary to transfer binary (non-text) files. This format is not compatible with non-Macintosh computers. Because the GIF and TIFF file formats are not Macintosh-specific, you will want to send them around without using MacBinary.

This section tells you how to set your communication program for transferring programs without MacBinary. See the communication program's user manual for complete information on transferring files.

Internet Config

One of the best options is to install Internet Config (see above for how to obtain it; it's even included in MacOS 8.5).

Internet Config keeps a listing of file types on the web, with the proper instructions on how to download them. Some other programs, including modern versions of web browsers, obtain this information from Internet Config when downloading.

Anarchie

Anarchie and Anarchie Pro, available at http://www.stairways.com/anarchie/, both use Internet Config.

Fetch

In Fetch 3.0 (ftp://ftp.dartmouth.edu/pub/software/mac/Fetch.sit.hqx), the **Suffix Mapping…** item on the **Customize** menu indicates the way to download files. Fetch uses Internet Config.

NetFinder

NetFinder, http://www.ozemail.com.au/~pli/netfinder/, uses Internet Config.

Netscape Navigator

In Navigator, http://www.netscape.com/computing/download/index.html, file mappings are entered into the **Navigator/Applications** panel of the **Preferences…** item of the **Edit** menu.

Microsoft Internet Explorer

Internet Explorer, http://www.microsoft.com/mac/ie/, uses Internet Config.

America Online

America Online handles GIF files correctly most of the time due to its internal settings.

CompuServe Navigator and Information Manager

CompuServe's Navigator and Information Manager always transfer GIF files properly. There is no need to take any special action.

These programs will upload TIFF files as MacBinary. They may download non-MacBinary TIFF files without the proper file type. To fix these downloads so you can open the files, use the features described in *Opening Documents,* above.

MacTerminal 2.0

Choose the **File Transfer…** command from the **Settings** menu. Click on the **Straight XModem** button.

Microphone II

Choose **Protocol Transfer…** from the **Settings** menu. Click on the **Binary** button. For downloads, you can enter the type and creator (the program that the files belong to, and the Macintosh will use to open them). Enter GIFf or TIFF for the type (upper and lower case is significant). If you enter GCon for the creator, the files will open GIFConverter when you double-click them.

White Knight

Choose **File Transfer…** from the **Options** submenu of the **Customize** menu. Use the options that tell it to not use MacBinary for any downloads, and to take no action with non-MacBinary TEXT files.

XModem Transfer Tool (Communications Toolbox)

The Communications Toolbox is a set of connection, terminal emulation, and file transfer tools. One of the programs that uses the Communications Toolbox is MacTerminal 3.0.

To download GIF or TIFF files, choose the **File Transfer…** command from the **Settings** menu. Make sure to choose XModem tool. Click on the **Method** pop-up menu, and choose **Straight XModem**.

Other programs

If you don't use one of the communication programs listed above, the best way to determine how to transfer files is to check your manual. When transferring GIF or TIFF files, make sure you make the following settings:

Turn off MacBinary if uploading. Most programs recognize that GIF and TIFF files are not MacBinary when downloading, so you won't have to do anything if you're only downloading.

Turn off all features that alter downloaded or uploaded TEXT files. These features may mention addition or removal of linefeeds or control characters. They may also be called filters.

Online Help

If you have trouble accessing files, leave a message to the system operator, or sysop, telling what you are trying to do and what problems you are having. The documentation that comes with your subscription to a service like CompuServe, GEnie, or America Online will tell you how to do this.

Supported File Formats

EPSF

Description
EPSF is a special structuring convention for Adobe PostScript files. This convention allows you to embed EPSF graphics into other PostScript documents.

Some Macintosh programs can accept EPSF documents and render them onto a PostScript printer.

Input
GIFConverter does not support EPSF. Reading EPSF files requires a PostScript interpreter, which is usually found in printers, or, rarely, on a computer. GIFConverter does not contain a PostScript interpreter.

Output
GIFConverter creates EPSF documents in two modes. The normal mode has a file type of EPSF, and contains a picture that other programs use when showing the EPSF graphic on the screen.

If you choose **text only**, the file has a type of TEXT and contains only the PostScript code. This form is ideal for hand editing files or sending the EPSF file to some other type of computer.

GIFConverter places images into the EPSF file as separate objects according to the following table.

Display Mode	Output
Cyan, Magenta, Yellow, or Black	Halftone image containing separation at appropriate screen angle.
Grayscale, Color	Halftone image of the gray components.

Options
Turning on **Save as Text** causes the EPSF output to be saved to a text file for easier editing.
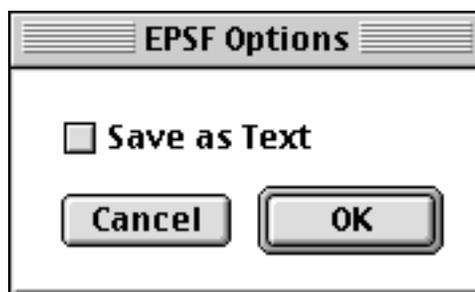
Restrictions
GIFConverter does not support the *colorimage* operator. EPSF documents created in **Color** mode contain a grayscale image only.

GIF

Description
GIF is the Graphics Interchange Format, designed by CompuServe to meet its needs for a machine-independent file format.

GIF files can contain one or more images, each containing 256 colors of a possible 16,777,216 colors, as well as a colored background. Each image is compressed using LZW[1] compression, which can reduce the size of the stored image by 30-50% or more.

GIFConverter fully supports the GIF87a standard.

Input
GIFConverter reads the background color. It reads each image in the GIF file into a separate image in memory. You can edit or move each image in a GIF file individually.

Output
If the **Global maps in multi-image GIF files** option is turned on, GIFConverter writes GIF files with a global color map that encompasses the best compromise colors to use for all the images and the background color. The global color map helps programs to determine which colors are the best to display before reading the rest of the GIF file. Each image has a local color map indicating the precise colors used in that image.

Display Mode	Output
Cyan, Magenta, Yellow, or Black	GIFConverter writes separate images containing the separation in its proper color.
Grayscale	GIFConverter writes separate images containing grayscale information.
Color	GIFConverter writes separate images containing full color information.

Options

GIF Options

☑ Interlaced
☐ GIF87a Compatibility
☑ Global Map

Cancel   OK

Turning on the **Save Interlaced** option causes GIFConverter to store GIF files in "interlaced" format, which allows online viewers to see some of the image progressively as it arrives over the modem. When you check this option, GIFConverter saves every eighth scan line, then every

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[1]Lempel-Ziv-Welch

fourth between them, then the remaining lines are filled in. This option is for uploading files intended to be viewed online.

Turning on **Global maps** causes GIFConverter to write a "global color map" when there is more than one image. This global map contains summary information about the colors in all the images. Each image still contains a list of colors that it uses. This box is initially unchecked since some GIF decoders mishandle files that contain both global and local color maps. If you have GIF files with more than one image, and other programs display them improperly, try changing this setting.

If the **87a Compatibility** checkbox is turned on (which it is when you first start GIFConverter), GIFConverter will warn you if you save GIF files that contain any extensions that require the 89a specification, like the text comments. If you want to use comment text, turn off the **87a Compatibility** checkbox.

Restrictions
GIFConverter writes eight bit GIF images even when in One Bit mode. This allows you to save GIF files with grayscale or color images on black-and-white Macintoshes.

 JPEG/JFIF

Description
The Joint Photographic Experts Group developed the JPEG compression scheme to support the digitizing and compression of photographs. The compression scheme is "lossy," that is, it sacrifices some information to achieve up to 20:1 compression. The theory behind JPEG is that there is no need to store information that the eye can't see anyway. The color of small details and some of the small details themselves are removed before compression.

Even as a lossy compression algorithm, JPEG's capability to store full-color (24-bit) images in small files makes it attractive for electronically handling photographs. A JPEG-compressed photograph exhibits none of the graininess seen in photographs compressed with a 256-color scheme such as GIF.

The JFIF format is one of many formats intended for storing JPEG files. JPEG-compressed graphics may also be encapsulated in PICT files.

Input/Output
GIFConverter can read and write JFIF files with 256 greys or millions of colors.

Options
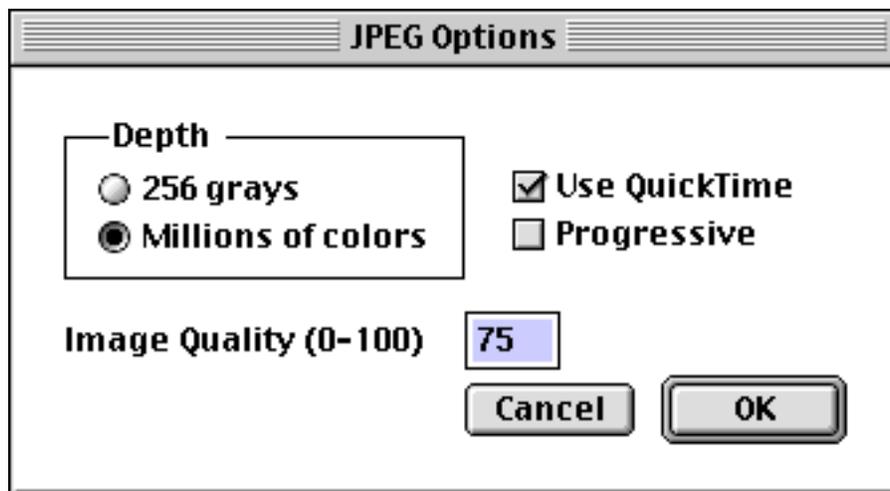
If you check the **Use QuickTime** box, GIFConverter uses an available QuickTime compressor. This box is only available if QuickTime is present.

Checking the **Progressive** box yields a progressive JPEG that draws into the screen gradually.

The **Image Quality** may be varied from 0 to 100; 75 is a good default. Settings towards 0 may cause increasing image degredation.

Restrictions
Decompressing and recompressing JPEG graphics many times can cause noticeable changes in the images.

MacPaint

Description
MacPaint is a one-bit raster format initially designed by Apple Computer, Inc. It contains a single image of 576 x 720 pixels.

Input
GIFConverter reads MacPaint documents into a document containing a single image. If you set the **Auto Crop on Open** option (see the **Options…** command above), GIFConverter automatically crops the image to the smallest portion that contains black pixels. This saves memory, and eliminates unnecessary white space automatically.

Output
On output, the *upper left* 576 x 720 pixels of the document are written into a MacPaint file.

Display Mode	One Bit Output	Eight Bit Output
Cyan, Magenta, Yellow, or Black	Dithered bitmap containing a single separation.	Not recommended.

| Grayscale | Dithered grayscale bitmap. | Not recommended. |
| Color | Not recommended. | Not recommended. |

Options

```
Paint Options
☑ Auto Crop on Open
[ Cancel ]   [ OK ]
```

Turning on the **Auto Crop on Open** option will cause GIFConverter to crop all paint files to the smallest non-white area they contain when opened. This can help when manipulating paint files under memory constraints.

Restrictions
In both Eight Bit and One Bit Color modes, the output files will contain blobs of black, since anything not white writes as black.

If the document is larger than 576 x 720 pixels, only the upper left portion will be written to the Paint file.

PICT

Description
The Macintosh uses this format in PICT files, on the clipboard, and in the StartupScreen files (see below). Most Macintosh graphic programs can read and write PICT files. The conventions listed here for PICT input and output apply to all three uses.

The PICT 2 format is an extension of PICT for Color QuickDraw. It can handle a virtually unlimited number of colors. This version of PICT works best on Macintosh II series and SE/30 CPUs. Other Macintosh CPUs can interpret PICT 2 files, but with a loss of all color information: all colors that are not white appear as black.

The original PICT format supports eight colors: red, green, blue, cyan, magenta, yellow, black, and white. Although all colors except white appear black on the screen, the ImageWriter II printer driver interprets these colors properly for printing.

Input
When reading an original PICT, or on a CPU that does not have Color QuickDraw, GIFConverter reads the eight colors available in the original PICT format.

When reading a PICT 2 document on a CPU that does have Color QuickDraw, GIFConverter first scans the picture looking for all the colors that it contains. If there are more than 256 colors,

GIFConverter chooses 256 compromise colors for the document.[1] The colors are used to make the color map. GIFConverter then re-reads the picture, mapping each color in the picture to the closest color it has chosen for the document.

Output

On output, GIFConverter simply draws the contents of the screen into the PICT file.

If the Eight Bit option is chosen, GIFConverter writes a color PICT 2 picture. It also adds some color table information required by early Macintosh II programs.[2]

Display Mode	One Bit Output	Eight Bit Output
Cyan, Magenta, Yellow, or Black	PICT containing a dithered representation of the chosen component of a color separation.	PICT 2 containing the chosen component of a color separation
Grayscale	PICT containing a dithered grayscale representation of the image.	PICT 2 containing up to 256 shades of gray.
Color	PICT containing seven images which, when displayed or printed, yield a color dither of the original image.	PICT 2 containing up to 256 colors.

Options

---
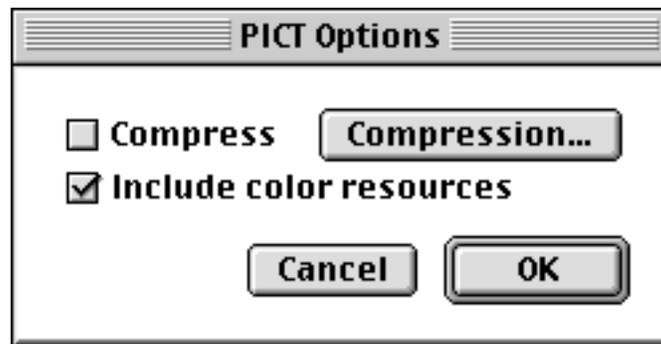
[1]For technical readers, GIFConverter uses the Median Cut Algorithm in this case.
[2]To be technical, it puts 'COLR', 'ctab', and 'pltt' resources into the resource fork.

Compression Settings

Compressor

Photo – JPEG ▼

Color ▼

Quality

Least   Low   Medium   High   Best

Cancel   OK
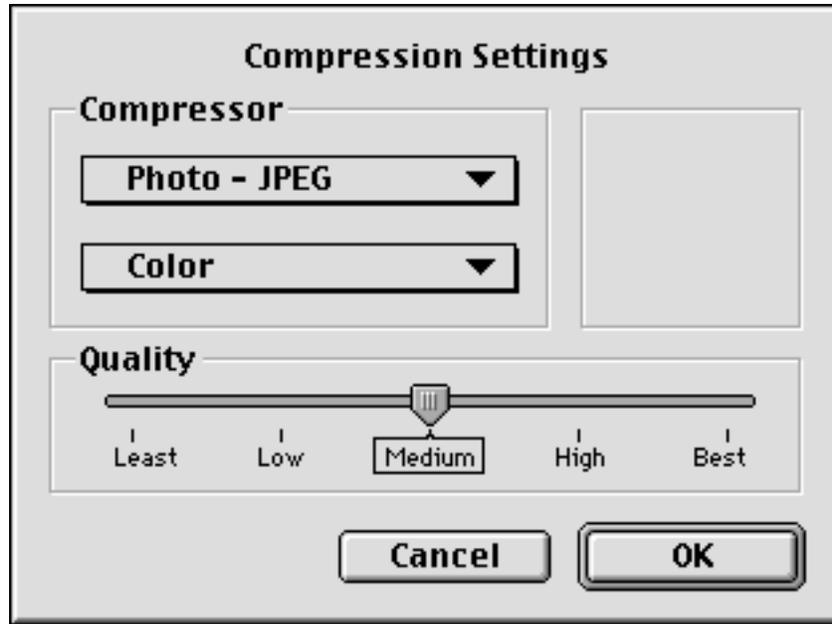
PICT files can be compressed if QuickTime is installed. Click on the **Compression…** button to adjust the compression options.

Checking the **Include Color Resources** button includes several color resources that early color painting programs made use of.

PNG

Description
PNG is the Portable Network Graphics format, a lossless graphic format that offers from one-bit (black and white) images up to 16 bit greyscale and 48 bit color images. PNG was developed in response to the patent threats to the GIF graphics format.

Input/Output
GIFConverter can or write read PNG files with up to millions of colors; it only supports 8 bits per sample.

Options
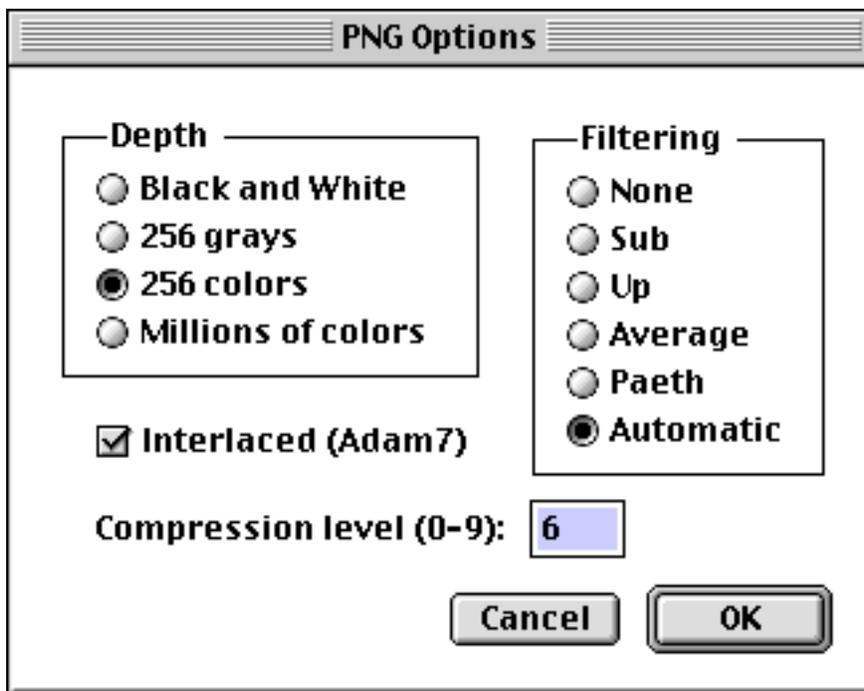
Interlaced causes PNGs to show up a bit at a time, the same way as GIFs do, except that PNG files interlacein both directions.

The **Compression Level** is a trade off between speed, memory, and time. The default of 6 is pretty good.

Filtering can improve compression. There are four filters, **Sub, Up, Average,** and **Paeth**. The **Automatic** setting is usually the best, because it tries to choose the filters that give the best compression automatically.

 RIFF

Description
RIFF, or Raster Image File Format, is a format designed by Mark Zimmer of Fractal Software. A RIFF file contains a single image of up to 256 grays or colors.

Input
GIFConverter reads the RIFF file as single image in a new document.

Output

Display Mode	Output
Cyan, Magenta, Yellow, or Black	Grayscale document containing the chosen color separation.
Grayscale	Up to 256 grays.

Color	Up to 256 colors. If the images contain more than 256 colors, the best 256 colors are used.

Options
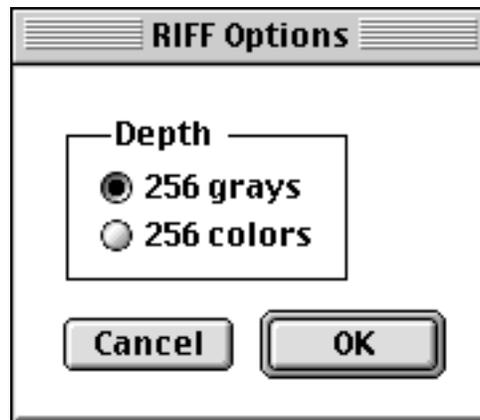
There are no options for RIFF except for choosing the number of colors in the output image.

Restrictions
GIFConverter only supports the grayscale and "virtual lookup table" (color table based) variants of RIFF. It does not support 24-bit RGB, HSL, CMY, and CMYK separation files.

RLE

Description
The RLE (or Run-Length Encoded) format is an early format used on CompuServe. GIFConverter provides this format for compatibility with small machines that do not have enough memory to read GIF files.

RLE files contain a single image, either 128 x 96 or 256 x 192 pixels.

Input
GIFConverter reads the file into a single image.

Output
GIFConverter chooses the smallest size that will still enclose the document. If the document is larger than 256 x 192 pixels, then GIFConverter only saves the upper-leftmost area.

GIFConverter saves an RLE file as if it were a small MacPaint file. See that section for details on the way images are saved.

 Scan Image

Description
The Thunderscan and Thunderworks programs use the Scan Image format to store scanned images. It stores a single image with up to 32 gray levels.

Input
GIFConverter reads the file into a single image.

Output
GIFConverter creates a single image containing what you see in a window. This image is written to the Scan Image file according to the following restrictions:

Display Mode	Output
Cyan, Magenta, Yellow, or Black	Scan Image file containing the grayscale representation of the desired separation.
Grayscale, Color	Scan Image file containing the grayscale image.

Restrictions
Scan Image files contain grayscale data even if One Bit mode is chosen. This allows you to save Scan Image files with grayscale information on black-and-white Macintoshes.

 Slide Show

Description
The Slide Show format is not a graphics format, but a special file type where GIFConverter keeps references to other files. You can create a Slide Show file by using then **New Slide Show…** command in the **File** menu.

 Startup Screen

Description
The Startup Screen format derives its name from the StartupScreen file placed in the System Folder and displayed when the Macintosh boots. The original StartupScreen file contained a single one-bit image of 512 x 342 pixels to match the size of the original Macintosh screen. On Macintoshes with Color QuickDraw, the file contains a single PICT (or PICT 2) that the Macintosh draws on the screen, adding color and the ability to cover larger screens.

GIFConverter can read and write both kinds of Startup Screen.

Input
When reading a Startup Screen file, GIFConverter follows the following rules:

If there is a PICT in the file, and GIFConverter is running on a Macintosh with Color QuickDraw, read the PICT.

If there is an original-format StartupScreen in the file, and GIFConverter is running on a Macintosh without Color QuickDraw, read the original-format StartupScreen.

Otherwise, read whatever is in the file.

See also the discussion of the PICT format above.

Output
GIFConverter writes the StartupScreen file according to the settings in the **Options…** dialog box (see above).

Writing a PICT-style Startup Screen works like the PICT file, above.

Writing an original-format Startup Screen works like the MacPaint format, except that GIFConverter restricts the image size to 512 x 342 pixels. See the MacPaint format for more information.

Options
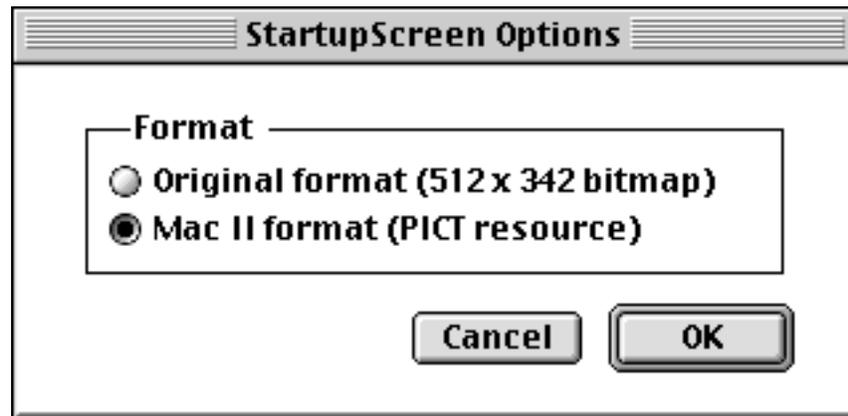
There are two kinds of Startup Screens. The original Startup Screen was a black-and-white image. Macintosh II computers can read a Startup Screen that contains a color picture.

Clicking the **Mac II format** option will cause GIFConverter to place a color picture into the StartupScreen file. Color Macintoshes (Macintosh II series, Macintosh Quadra series, and the Macintosh SE/30) read this data to produce the color picture on the screen.

Clicking the **Original format** option will cause GIFConverter to create an original-style black-and-white Startup Screen. Macintoshes without Color QuickDraw use this data to produce the image on the screen.

Restrictions
If you read a PICT style Startup Screen on a Macintosh without Color QuickDraw, the results are usually rather poor. The picture may be blotchy.

TIFF

Description

TIFF, or Tag Image File Format, is a format developed by Aldus Corporation and Microsoft Corporation for storing images.

GIFConverter fully supports TIFF classes G, P, and R of the version 5.0 specification. GIFConverter supports LZW compression for input only. The TIFF classes are:

Class	Description
B	Black-and-white images. Compression options include CCITT 1D or PackBits. GIFConverter supports only uncompressed class B.
G	Grayscale data, 4 or 8 bits per pixel.
P	Palette color, up to 256 colors, one to eight bits per pixel.
R	RGB full color; 16,277,216 possible colors.

Input

GIFConverter reads the image into a new document.

Output

GIFConverter creates a single image containing what you see on the screen, and writes the image to the file according to the following table:

Display Mode	Output
Cyan, Magenta, Yellow, or Black	TIFF Class G file containing the grayscale data corresponding to the desired separation.
Grayscale	TIFF Class G file containing grayscale data.
Color	TIFF Class P file containing palette color data. If there are more than 256 colors among the images, the best 256 are chosen, and the images are written using the closest colors in the palette.

Options
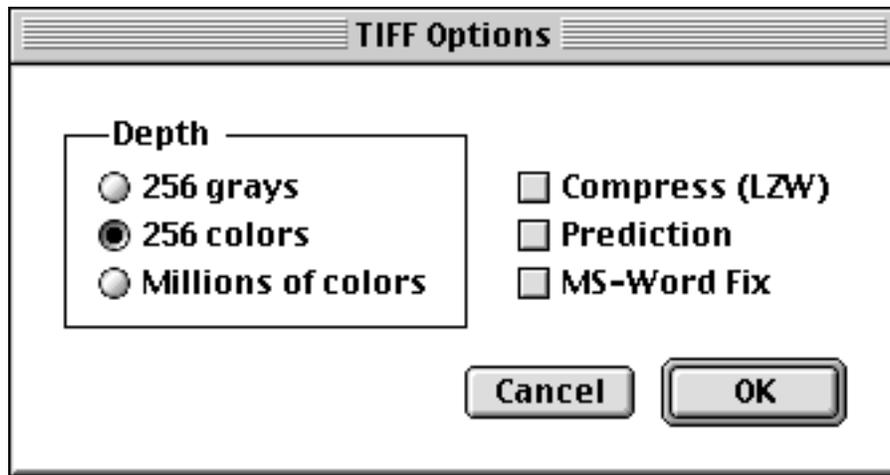
Turning on **Compression** causes TIFF files to be saved with LZW compression. Clicking on **Use Prediction** can improve the compression, but may not be compatible with some other applications.

The **MS-word Fix** checkbox causes GIFConverter to allow for errors in the TIFF file support in Microsoft Word and other Microsoft products.

Restrictions

GIFConverter's support of Class G implies support of class B without compression (a grayscale image with only two colors is the same as a black and white image).

GIFConverter does not support privately defined compression schemes. These schemes are legal in TIFF, but not recommended under version 5.0 of TIFF.

Support

Common problems

1. If you get system errors (the bomb box) when starting GIFConverter and reading the first images, try moving the "GIFConverter Prefs" file to the Trash from the Preferences folder inside the System Folder. Sometimes, if GIFConverter crashes, this file may become corrupt.

2. If you get the message that GIFConverter could not open a GIF or TIFF file because of an error in the compressed image, then you probably didn't download the file in binary format. Double-check the settings for your terminal program. If you're using FTP or Kermit to move images around between computers, remember to set them to binary mode.

3. If GIFConverter won't open the files you've downloaded, they may not have the GIF type. Try dropping the file icon onto the GIFConverter program icon.

Reporting Bugs

The best way to report a defect in GIFConverter is to use the online bug reporter. Choose **Report a Bug on the WWW** from the **Help** menu. This will take you to a page on the web where you can fill out information about the bug. GIFConverter will transmit its version number and a small amount of information about your computer so that parts of the form will be filled out. This information includes only version numbers for GIFConverter and MacOS, and the kind of hardware you're using.

Or, if GIFConverter won't run at all, go directly to the page at http://www.kamit.com/cgi-bin/gcbug.

You can also send mail to any of the addresses (US Mail or electronic) on the cover. Also see the support information in the front of the manual.

When you report a bug, please include the following:

- System configuration (such as: "Macintosh IIci, 4Mb RAM, 80Mb hard disk")

- If it's a printer problem, indicate the printer you use ("LaserWriter") and the version number of the printer driver (usually found in the Page Setup dialog box).

- Look in the System Folder and list all files listed as "Startup" or "Control Panel" documents.

- Please indicate what you were trying to do, and how the program failed you. If you get an error message or a system error (bomb) box, please indicate the text of the error message as well as any error code numbers that appear.

- If you're having a compatibility problem with sharing files with another application, please indicate the name and version of the application, as well as the name of the publisher.

Updates

Updates are available on the website (http://www.kamit.com/gifconverter/). Or, choose the **Check for Updates on the WWW** command on the **Help** menu. GIFConverter will supply the

website with its version number, and you will find yourself on a page telling you if you have the latest version, and if not, how to obtain it.

Appendix A: TIFF Compatibility

TIFF files may vary in format, and there is often the chance of incompatibilities between programs. GIFConverter conforms to the TIFF classes specification described in Appendix G of the *Tag Image File Format Specification Version 5.0* of 8/8/88.

GIFConverter-generated files contain only one IFD[1] (it combines multiple images , which contains the following tags:

Tag	Class G	Class P	Class R
BitsPerSample	8	8	8,8,8
ColorMap	n/a	256 RGB triplets	n/a
Compression	1 (no compression, packed data)		
ImageLength	Vertical extent of all images		
ImageWidth	Horizontal extent of all images		
PhotometricInterpretation	1 (0 is black, 255 is white)	3 (palette color)	2 (RGB triplets)
Predictor	0 (none)		
ResolutionUnit	2 (inch)		
RowsPerStrip	same as ImageLength		
SamplesPerPixel	1	1	3
StripByteCounts	depends on RowsPerStrip and ImageWidth		
StripOffsets	one entry		
StripsPerImage	1		
XResolution	1/72		
YResolution	1/72		

GIFConverter generates Class R output if the **RGB Output** option is selected in the **Options…** dialog box, otherwise it generates Class P.

If **Color** is not checked, GIFConverter generates Class G.

GIFConverter-generated TIFF files are always written in Motorola byte ordering[2]. In conformance to the TIFF specifications, GIFConverter can read both Intel and Motorola byte ordering.

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[1]Image File Descriptor. An element of a TIFF file that identifies an image in the file and describes its characteristics.

[2]The byte ordering determines how multi-byte numbers are stored in the file. If you don't understand this, don't worry. It's technical stuff for technical people.

Appendix B: File Format References

On the Web

There are a number of graphic file format documents at the following locations:

- ftp://ftp.ncsa.uiuc.edu/misc/file.formats/graphics.formats/

- ftp://x2ftp.oulu.fi/pub/msdos/programming/formats/

- http://andy.rz.uni-karlsruhe.de/~andy/doc/graphic-formats/

EPSF

Encapsulated PostScript Files Specification, Version 3.0.
http://www.adobe.com/supportservice/devrelations/PDFS/TN/5002.EPSF_Spec_v3.0.pdf

GIF

Graphics Interchange Format^{SM}, Version 89a
CompuServe Incorporated
Columbus, Ohio

Available on CompuServe, in the GRAPHSUPPORT forum, library 14, file GIF89A.DOC, GIF89A.SIT or GIF89A.ARC. Also available on other major online services. There is no definitive location on the Internet, but you might want to search AltaVista for this file.

JPEG

Wallace, Gregory K. *The JPEG Still Picture Compression Standard*, Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44.

The Data Compression Book by Mark Nelson, published by M&T Books (Redwood City, CA), 1991, ISBN 1-55851-216-0.

JPEG Still Image Data Compression Standard by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand

Reinhold, 1993, ISBN 0-442-01272-1. This book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2).

The JFIF file format specification can be ordered from:
Literature Department
C-Cube Microsystems, Inc.
399A West Trimble Road
San Jose, CA 95131
(408) 944-6300

MacPaint
Macintosh Technical Note PT 24: MacPaint Document Format
This document can be found on the web at http://developer.apple.com/technotes/pt/pt_24.html.
You'll also want to look at the PackBits description at
http://developer.apple.com/techpubs/mac/OSUtilities/OSUtilities-39.html#HEADING39-39.

PICT
Inside Macintosh : *Imaging with QuickDraw*.
Published by Addison-Wesley, and available at major bookstores.

Chapter 7, which is on the web at
http://developer.apple.com/techpubs/mac/QuickDraw/QuickDraw-332.html, describes pictures in
general, including how to create PICT files. Appendix A, at
http://developer.apple.com/techpubs/mac/QuickDraw/QuickDraw-458.html, describes the
opcodes stored in a QuickDraw picture.

PNG
PNG (Portable Network Graphics) Specification Version 1.0

The definitive site for the PNG graphic format is http://www.cdrom.com/pub/png/.

RLE
Standard for RLE files
Chris Hopkins

Available on CompuServe, in the GRAPHSUPPORT forum, library 14, file RLESTD.ASC.

Scan Image
Thunderware
21 Orinda Way
Orinda, CA 94563
(510)254-6581

The Scan Image format was described in early ThunderScan documentation. Thunderware
prefers that developers support TIFF files if they want to work with their scanners.

Startup Screen
Startup Screens contain either a 512 x 342 bitmap in the data fork (uncompressed), or a PICT
ID=0 resource in the resource fork. (See the information for PICT, above.)

TIFF
TIFF 6.0
Available from Adobe at
http://www.adobe.com/supportservice/devrelations/PDFS/TN/TIFF6.pdf.

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