LView Pro 1.B

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File/New

This dialog window prompts for image dimensions, then creates a new image for edition. The new image background is painted with the color defined in the Options/Background Color command.

This command is useful for creating a (blank) image and then defining its contents with the Edit/Add Text command and/or the Edit/Paste command.

Options/Background Color

This command opens the 24-bit Color Dialog, when the image being edited has 24-bit/pixel color information, or the Palette Entry Color Dialog, when the image being edited has palette based color information. The color you define will be used to paint images created with the File/New command, and to paint image areas after the Edit/Cut or Edit/Delete commands are performed on a Selection area. When the Edit/Redimension command increases the number of columns or rows, the new image area will also be painted with this color.

When saving an image to a disk file using either the GIF87a or the GIF89a format, LView Pro will store the background color that is currently selected in that file. This information will be read the next time the file is loaded.

When saving an image to a disk file using the GIF89a format, LView Pro will store the background color that is currently selected as the GIF's transparent color.

It is possible to select the desired palette entry by clicking the mouse on one of the pixels in the image. Exit this dialog by clicking the "Dropper" button, and then click the left mouse button on a pixel. The corresponding palette entry will be selected as the Background color.

File/Open

This dialog window is used to select the filename containing an image to be loaded into LView Pro for viewing/editing. Regardless of the filename extension, LView Pro will examine the file contents and determine the internal file format among the supported <u>Image File Formats</u>.

If loading is successful, the same filename will be used in the <u>File/Save</u> command.

This command is also available at the Toolbar.

File/Save

Saves the image being edited using the filename obtained in the last <u>File/Open</u> execution. If this filename doesn't exist or is invalid, the command <u>File/Save as</u> will be executed instead.

This command is also available at the Toolbar (click with the RIGHT mouse button!).

File/Save as

This dialog window obtains the filename where the current image is to be saved. The format may be selected among the supported Image File Formats.

This command is also available at the Toolbar.

Image File Formats

LView Pro supports the following image file formats:

JPEG - Joint Photographers Expert Group, JFIF

Reads baseline compliant JPEG/JFIF files
Writes JPEG/JFIF files in 3 or 1 (Grayscale) bytes per pixel, 2H2V subsampling

BMP   - MS Windows and OS/2 bitmap

Reads and writes BMP files with 1, 4, 8 and 24 bits of color information per pixel

TIFF - Aldus' Tagged Image File Format 6.0

Reads TIFF files with 1, 4, 8 and 24 bits of color information per pixel, in strip or tile format, uncompressed
or compressed with PackBits, Next compression, Thunderscan or LZW compression.

Writes TIFF files with 1, 4, 8 and 24-bits of color information per pixel, always in strip format either
uncompressed or using LZW compression.

TGA   - Truevision Targa

Reads TGA files with 8, 15, 16 and 32 bits of color information per pixel
Writes TGA files with 8 or 24 bits of color information per pixel, uncompressed

GIF   - Compuserve's GIF87a and GIF89a

Reads and writes GIF87a and GIF89a formats
Writes transparent color and background color information when using GIF89a format

PCX   - ZSoft's PCX

Reads all PCX versions, with 1, 4, 8 or 24 bits of color informatin per pixel
Writes PCX version 3.0, with 1, 4, 8 or 24 bits of color informatin per pixel

PBM, PGM and PPM - Jef Poskanzer's PBMPLUS formats

Reads PBM (Portable Bitmap, monochrome), PGM (Portable Graymap, grayscale) and PPM (Portable
Pixmap) in both ASCII and RAWBITS formats
Writes PPM files in RAWBITS format

Additional file formats may be added in future versions.

File/Delete

Issue this command to delete the last filename obtained in the File/Open or File/Save as commands. If deletion is not successful a message is displayed.

File/Print

This dialog window allows for Printer configuration, followed by image printout. Use the File/Printer Setup and Options/Printer commands to customize other options related to printer output.

Options/Printer

In this dialog window, you specify:

- Column enlargement/shrinking percentage,
- Row enlargement/shrinking percentage:

Setting these to 100% will produce an image in the actual printer resolution,
Setting these to different values will alter the aspect ratio on resulting image,
Values greater than 100% will enlarge the corresponding dimension,
Values smaller than 100% will shrink the corresponding dimension.

- Fit to printer page

When checked will enlarge/shrink the image to maximize the printed area.

- Center

When checked will center the image printout.

File/Printer Setup

This dialog window is used for selecting and configuring the target printer. This dialog is also accessible from the File/Print command. Use this command in conjunction with Options/Printer to customize image printout.

File/Exit

This command ends LView Pro's execution. If the current image has been edited, LView Pro will offer to save it before exiting.

Edit/Undo

Use this command to undo the last edition made to the current image. When undoing is not possible, this menu item will be dimmed. To free memory allocated to undo buffers use the Options/Interface dialog and disable undo operations.

This command is also available at the Toolbar.

Edit/Cut

This command cuts (deletes) the image or current <u>selection area</u> and places it in the Clipboard.   The format for clipboard image creation is set in the <u>Options/Interface</u> dialog. If a <u>selection area</u> is deleted, the background replacing it is painted using the color selected in <u>Options/Background Color</u>.

This command is also available at the Toolbar.

Selection Area Operations

Selection Areas are image pieces that can be processed separately from the image being edited. Most commands in the Edit Menu will be performed to the current Selection Area, if one is defined. On the other hand, commands in the Retouch Menu will only be available when no Selection Area is defined.

Introduction

Selection Area utilization is broad. They can be used to delimit an image area for cropping, to hold an image pasted from the Clipboard, to delimit an area of the editing image to be copied to the Clipboard, to duplicate or move parts of the image being edited and more. In here we will only cover the basic Selection Area operations, since all other operations follow the same principles.

A Selection Area can be in one of two states: DEFINED and DETACHED. An area is said to be DEFINED when it is visually represented by a RED/WHITE frame. The term DEFINED simply means that the user has delimited the area rectangle. When a Selection Area becomes DETACHED, its frame is changed to BLUE/WHITE colors. A DETACHED Selection Area already contains its own image information, independent of the image being edited.

Creating a DEFINED Selection Area

Click either the left or right mouse button anywhere on the image being edited, then (without releasing the mouse button) drag the mouse pointer. A Selection Area frame will be displayed delimiting the rectangular area defined by the point where you first clicked the mouse button and the current position mouse pointer position. There is no required order for Selection Area definition, the point where you initially click the mouse button may end up being any of the four corners defining the area, depending on the point where the mouse button is released. To finish Selection Area definition, simply release the mouse button in the position of your choice.

The DEFINED Selection Area frame is equipped with four handles, positioned at each of its corners. The handles are small squares exterior to the frame rectangle. By clicking either the left or right mouse button on one of these handles, the Selection Area frame may be resized for fine positioning. A DEFINED Selection Area may be moved by clicking either the left or   right mouse button over one of its frame segments and dragging the mouse pointer.

Once a DEFINED Selection Area is properly positioned and sized, it is ready for being DETACHED.

Creating a DETACHED Selection Area

While many commands operate in the same fashion with DEFINED and DETACHED areas, the process of detaching a DEFINED area and creating a DETACHED one is of interest. A DETACHED Selection Area is created from a DEFINED one by clicking a mouse button anywhere inside the area frame. This operation will produce different results depending on the mouse button utilized. If the LEFT mouse button is used, the original image area contained inside the area frame is erased and painted with the color defined in

Options/Background Color. If the RIGHT mouse button is used, the original image is left unchanged, and the Selection Area will hold a copy of it.

If you detach a DEFINED Selection Area using the LEFT mouse button by mistake, the operation may be undone using Edit/Undo, if Options/Enable Undo is checked.

Moving a DETACHED Selection Area

Selection areas do not have frame handles, and cannot be resized. They can be moved by clicking either the left or right mouse button anywhere inside the area frame (or on the area frame) and dragging the mouse pointer. Release the mouse button to finish moving the DETACHED Selection Area.

Applying a DETACHED Selection Area

A DETACHED Selection Area may be applied (tiled) anywhere over the image being edited. The original contents of the image will be overwritten by the contents of the Selection Area, and the Selection Area will be destroyed.

If you apply a DETACHED Selection Area by mistake, the operation may be undone by Edit/Undo, if Options/Enable Undo is enabled.

Undefining a Selection Area

DEFINED Selection Areas may be undefined simply by clicking either the left or right mouse button outside the area frame. If the area frame covers the entire image, use Edit/Undefine.

DETACHED Selection Areas may be undefined by using Edit/Cut, Edit/Delete or Edit/Undefine.

Additional Topics on Selection Areas

The thickness of Selection Area frames can be adjusted in the Options/Interface dialog window.

Selection Area frames are animated, by default, for improved visibility over color images. Sometimes the animation process makes it difficult to visualize the mouse pointer, when it is positioned over or near a frame segment. This effect is more easily noticed when using a slower graphics card. For that reason, the animation may be optionally turned off in the Options/Interface dialog window.

Edit/Copy

This command places a copy of the image or <u>selection area</u> in the Clipboard. The original image or area is left unchanged. The Clipboard image format is set in the <u>Options/Interface</u> dialog.

This command is also available at the Toolbar.

Edit/Paste

This command is enabled whenever DIB or DDB data is present in the Clipboard. For an explanation about these formats see the Options/Interface help topic.

The Paste operation is performed differently depending on the current state of LView Pro:

- If no image is currently loaded: The pasted image becomes the editing image,

- If there is an image being edited, and no selection area is defined: The pasted image is placed in a detached selection area,

- If there is an image being edited and a selection area is defined: The pasted image replaces the selection area contents, maintaining the selection area dimensions.

For more information see the Selection Area help topic.

This command is also available at the Toolbar.

Edit/Delete

This command deletes the image being edited (not the file!) or the current selection area. If a selection area is deleted, the background replacing it is painted using the color set in the Options/Background Color dialog.

Edit/Capture

This command allows capturing elements from the desktop into LView Pro's window. Capturing options are:

- Desktop: The contents of the whole desktop area are captured.

- Window: The contents of the window last selected window (including caption and frame) are captured.
This option is not available on 16-bit versions of LView Pro, when running under Windows NT or other 32-bit versions of Windows.

- Client Area: The contents of the client area of the window last selected (excluding caption and frame) are captured.
This option is not available on 16-bit versions of LView Pro, when running under Windows NT or other 32-bit versions of Windows.

If no image is currently loaded, the captured image will become the new editing image.

If an image is already loaded, the captured image will become a <u>Selection Area</u>.

If an image is already loaded and a <u>Selection Area</u> is defined, the captured image replaces the <u>selection area</u> contents, maintaining the area dimensions.

Edit/Resize

This dialog window allows to change the dimensions of the image being edited, or Selection Area. Choose among the pre-defined dimensions, or enter custom values for Columns and/or Rows. Special options in this dialog are:

- "New size/Current size ratio" scrollbars: Allow for entering resize ratios for the new image dimensions. For example, scroll to 0.5 to reduce one dimension to 1/2 of its original value, scroll to 3.0 to enlarge one dimension three times its original value. When "Preserve aspect ratio" is checked, scrolling one of the scrollbars will affect the other scrollbar's position.

- Fit to desktop: Resizes the image to occupy the maximum desktop area. Notice that the image required scrollbars to be viewed, since window caption, menu and frame are not counted. The image will be fully visible (without being resized) in Full Screen Mode.

- Fit to max client: Resizes the image to occupy the maximum client area size. The image will be fully visible without the need of scrollbars.

- Preserve aspect ratio: When checked, will alter the selected Column or Row value to keep the original image aspect ratio

This command is also available at the Toolbar.

Options/Full Screen

Displays the image centered in the screen. The screen background is set to black. If needed, the image is shrunk   to fit completely in the screen. This mode can be automatically set when displaying images in a Slideshow.

To enter or exit this mode, double click the left mouse button.
Another way to exit full screen mode is to press the ESC key.

During a Slideshow, clicking the right mouse button will advance to the next image. After the Slideshow is complete, clicking the right mouse button will terminate full screen mode.

Full screen mode may be performed in a topmost window, see Options/Interface for more information.

This command is also available at the Toolbar.

Options/Slideshow

LView Pro may load and display a sequence of image files. This operation is called a slide show. There are two ways to select the files for slide show exhibition:

- Using Windows' File Manager to perform a <u>Multiple File Selection</u> and setting the "Drag&Drop Destination" to slide show in <u>Options/Interface</u>.

- Using <u>File/Multiple Open</u>.

This dialog window customizes the slide show behavior. Options are:

- Cycle slides: When checked, causes the first file to be reloaded after the last one is exhibited and continuously cycle on the file selection.

- View <u>full screen</u>: When checked, causes images to be displayed in <u>Full Screen</u> mode.

- Interactive after mouse click: If selected causes an image will be displayed until the right mouse button is clicked in LView Pro's client area (or on the desktop if in <u>Full Screen</u> mode).

- Automatic after X seconds: If selected causes the next image to be loaded after the desired number of seconds.

To abort the slide show: If not in <u>Full Screen</u> mode, click on the menu bar, if in <u>Full Screen</u> mode, click the left mouse button.

Edit/Redimension

This dialog window is similar to the Edit/Resize dialog. Redimension will not change the image's aspect ratio, but add/take columns and rows from/to the image being edited or Selection Area.

Edit/Crop

This command is only available when a <u>Selection Area</u> is defined. It replaces the current image by the contents of that area.

This command is also available at the Toolbar.

Edit/Undefine

This command undefines the current <u>Selection Area</u>.

Edit/Apply

This command is available when the <u>Selection Area</u> is detached. It tiles the <u>selection area</u> over the editing image at its current position.

Edit/Add Text

This dialog is window where you define a string of text to be added to the editing image. Text is always added to a detached <u>Selection Area</u>,   that can be moved, applied or deleted after closing this dialog. If no area is defined, this command will create a default <u>Selection Area</u> in the upper left corner of the editing image. In the dialog you can define characteristics for the text to be added, such as color, background color, orientation, positioning, font, and text background transparency.

You can also move and resize the selected area while defining the text to be added, by using the "Modify <u>Selection Area</u>" scrollbars.

This command is also available at the Toolbar.

Edit/Flip Horizontal

Flips (mirrors) the image horizontally. If a <u>selection area</u> is defined, only that area will be flipped.

⇄
This command is also available at the Toolbar.

Edit/Flip Vertical

Flips (mirrors) the image vertically. If a <u>selection area</u> is defined, only that area will be flipped.

⇅
This command is also available at the Toolbar.

Edit/Rotate Left

Rotates the image counter clockwise, transforming rows into columns and vice-versa. If a selection area is defined, only that area will be rotated.

This command is also available at the Toolbar.

Edit/Rotate Right

Rotates the image clockwise, transforming rows into columns and vice-versa. If a <u>selection area</u> is defined, only that area will be rotated.

This command is also available at the Toolbar.

Multiple File Selections

To activate multiple file operations, Slideshow, Contact Sheet, Batch Compression and Batch printing, the user must begin by defining the list of files to be processed in the operation.

The list of files may be defined by either using the <u>File/Multiple Open</u> dialog, or by using Window's File Manager together with drag&drop operations. This help topic covers the latter option, for information about the former see <u>File/Multiple Open</u>.

In order to perform a multiple file selection, follow these steps:

- Open File Manager, and open/select a directory window containing the files. If files are present in more than one directory, use the (File Manager's) File/Search command to gather all files in a single window,

- Click the left mouse button on the first file you want to select, release the mouse button,

- Press the CONTROL key, and WITHOUT releasing it, click with the left mouse button on each other file you want to add to the selection. Each file you click on should become highlighted to indicate that was added to the selection. All previously selected files should remain highlighted as subsequent files are added to the selection,

- After you have clicked on the last file, release the CONTROL key,

- Now, click the left mouse button on ANY of the selected files and, WITHOUT releasing the mouse button, drag the mouse pointer over LView Pro's window (or icon, if LView Pro is minimized),

- Once the mouse pointer is positioned over LView Pro, release the mouse button.

The files you selected will be processed by the Drag&Drop Destination function currently set in the <u>Options/Interface</u> dialog.

Tool Bar Command List

Each tool bar icon-button selects a command also available at LView Pro's menus.   All icon-buttons may be utilized by clicking the LEFT mouse button and then releasing it while the mouse pointer is positioned over that icon-button. Some icon-buttons execute a different   command if clicked on with the RIGHT mouse button.

LView Pro may, optionally, exhibit a legend containing a short explanation about the function of individual ToolBar buttons. To enable/disable this feature, use the option "Show ToolBar legends" in Options/Interface. If this option is enabled,   a legend will be displayed every time the mouse pointer stays positioned over a ToolBar button for a short while.

The correspondence between tool bar icon-buttons   and menu commands is described bellow:

This is the Tools button. It is exhibited at LView Pro's window caption when the tool bar is available for usage, click on it to restore the tool bar window.

This button replaces the image of any tool bar button (including the Tools button) to indicate that original button's function is not available for execution. For instance, it will replace the Edit/Resize button when there is no image to be edited.

File/Open and File/Reopen: Left click to use Open, Right click to use Reopen.

File/Save as and File/Save: Save current image to file. Left click to use Save as, Right click to use Save.

File/Multiple Open: Dialog to specify a list of files to be loaded.

Edit/Undo: Undo last editing operation.

Edit/Cut: Delete image or selection area and place it in the Clipboard.

Edit/Copy: Copy image or selection area to the Clipboard.

Edit/Paste: Insert image from Clipboard.

Edit/Crop: Transform selection area into editing image.

Edit/Resize: Enlarge/shrink editing image or selection area.

Edit/Add Text: Include text in the editing image.

Edit/Flip Horizontal: Flip editing image or selection area horizontally.

Edit/Flip Vertical: Flip editing image or selection area vertically.

Edit/Rotate Left: Rotate editing image or selection area counter clockwise.

Edit/Rotate Right: Rotate editing image or selection area clockwise.

Retouch/Gamma Correction: Brighten/darken editing image.

Retouch/Color Balance: Linear add/subtract RGB color components.

Retouch/Contrast Enhance: Add/subtract contrast.

Retouch/HSV Adjust: Change Hue, Saturation and/or Value.

Retouch/YCbCr Adjust:: Change Luminance and/or Chrominance.

Retouch/Interactive RGB: Change RGB using function maps.

Retouch/Exp Enhance: Brighten image reducing contrast.

Retouch/Log Enhance: Brighten image reducing color bleeding.

Retouch/SineH Enhance: Brighten image increasing contrast.

Retouch/Grayscale: Transform image into grayscale.

Retouch/Negative: Transform image into its (photographic) negative.

Retouch/Image Filters: Apply user defined image filters.

Retouch/Palette Entry: Edit one palette entry RGB values.

Options/Full Screen: Exhibit the current image in full screen mode.

Options/Interface: Setup various interface options.

Options/Jpeg I/O: Left click to alter Jpeg compression/decompression setup, Right click to switch decompression modes.

Options/Jpeg I/O: When this button is BLUE, Normal decompression mode is set, when it's RED, Preview is set.

Help/About LView Pro 1.B: Open LView Pro's About dialog window.

Help/Contents: Activate LView Pro's Help System

Options/Contact Sheet

A contact sheet is an image that groups smaller images. It can be useful for cataloging images that are related to each other. The smaller images are sometimes called "thumbnails".

This dialog window configures the following contact sheet making options: text font, text size, text attributes and position, text color, text background, image background and image dimensions. These options will be used when a <u>Multiple File Selection</u> is performed and the "Drag&Drop" destination in <u>Options/Interface</u> is set to Contact sheet. A Contact sheet may also be built using the <u>File/Multiple Open</u> command.

Before building a contact sheet, LView Pro will exhibit the <u>Contact Sheet Preview</u> dialog.

24-bit Color Dialog

This dialog is used to obtain/edit a color definition. Colors are defined in terms or their Red, Green and Blue components. Each component may assume values in the range [0..255], being 0 the darker value and 255 the brighter value. Black is RGB (0, 0, 0) and White is RGB (255, 255, 255). A color is gray if its Red, Green and Blue components are all set to the same value.

The color obtained in this dialog may look different when applied to the editing image. When the Graphics Mode is not a True color or high color mode, LView Pro will find the nearest color to represent the color selected in this dialog.

Graphics Mode

LView Pro will run at its best in True or High color graphics mode. On a 256-color (palette based) mode, LView Pro will still exhibit quality images, by quantizing color information and creating a suitable palette for exhibition. On 16 color mode, images will not be displayed correctly. It is possible to change the graphics mode currently selected using Window's Setup program (at Program Manager), and you may find that your graphics card is able to support a better color resolution mode. Bellow is an explanation for each mode mentioned and other useful information.

Pixel resolution: In this text, means the number of (graphic) columns and rows that can be displayed. For instance, in 640x480 pixel resolution the screen width is 640 pixels (dots) and the screen height is 480 pixels.

True Color Mode: each pixel is represented by its Red, Green and Blue color components. Each color component may assume values in [0..255], that is, each color component requires one byte for storage. One pixel, therefore, requires 3 bytes for storage and that's why True Color mode is sometimes called 24-bit/pixel color mode. The total number of different colors combinations is 2 to the 24th, more than 16.7 million colors. Some image file formats store images with 24-bit/pixel color information. Jpeg is one of these formats. Nowadays there are good quality and low cost graphics cards supporting True Color mode at up to 640x480 resolution.

High Color Mode: each pixel is represented by its Red, Green and Blue color components. Each color component is defined by either 5 or 6 bits, assuming values in [0..255] with a granularity of either 8 (5 bits) or 4 (6 bits). This means that although a color component may range from 0 to 255, it can only assume values like 0, 7, 15, ..., 248, 255 (in 5 bit resolution). Nowadays there are good quality and low cost graphics cards supporting High Color mode at up to 800x600 pixel resolution.

Palette Based Mode: each pixel is represented by an index (one byte) to the currently selected Palette. A Palette is a list (an array) of Red, Green and Blue values. For instance, if a pixel value is 33, the color used to represent that pixel is obtained from the 33rd entry in the palette. Since pixels are represented by a single byte, the Palette size is limited to 256 colors. In this mode, not more than 256 colors may be displayed at the same time. To display a 24-bit color image (with potentially 16.7 million colors) using only 256 colors, a preprocessing called Color Quantizing is utilized. A standard VGA card cannot display in Palette based mode inside Windows. Standard VGA cards can only achieve 256 (simultaneous) color display at 320x200 pixel resolution, and Windows does not run in this resolution. All Super VGA cards can display in Palette based mode at up to 640x480 pixel resolution. Super VGA cards with 1MB Video Memory can display in Palette based mode at up to 1024x768 pixel resolution.

16 Color Mode: Standard VGA cards are limited to this color mode. Only 16 colors may be simultaneously displayed, and even these 16 colors cannot be fully customized for a given image, since Windows' relies on these to display interface items, like buttons, scrollbars, caption bars, selected and normal text, etc.

Changing the Graphics Mode: To change the graphics mode you must use Windows' Setup program (at Program Manager). You need to chose "Options/Change System Settings" and provide a new Display driver. Display drivers are available from graphics card's manufacturers, and usually a disk with Windows' drivers is supplied together with the card. If you don't have an alternative driver, contact the manufacturer to obtain one. Sometimes drivers are updated to improve performance and/or fix bugs, and it's a good idea to look for upgrades.

Color Quantizing: If your graphics card does not support True or High color, you must allow LView Pro to color quantize images when image files are loaded. Color quantizing is the process of selecting a set of colors that approximate the ones required to display an image. Dithering, also recommended,   is a method of combining a small set of colors together (like a Mosaic) to produce the effect of non-available colors. For instance, a tone of yellow that is not available among the palette colors can be simulated by positioning pixels in other tones of yellow very close together. LView Pro will automatically configure the Quantizing and Dithering setup adequate for your graphics card if "Auto quantize setup" is enabled in Options/Interface. You can change the default setup using the Options/Quantizing dialog. You can also change the color representation for the image being edited, using the Retouch/Color Depth dialog.

Retouch/Color Depth

Use this dialog window to redefine the color depth of the image being edited. Color depth here means the maximum number of colors that can be used to display the image. This dialog allows for changing the color depth to the following options:

- True color image: Up to 16.7 million colors

- Palette image: Up to 256 colors

If you select True color image, your graphics card may not be able to exhibit the resulting image correctly, if you select Palette image, you can also determine the number of colors in the color palette:

- 256 colors (including Windows palette): LView Pro will create a new palette for the image or adapt the current palette to hold 256 color entries. The default Windows' colors will be included in the resulting palette.

- Windows palette (16 colors): LView Pro will try to represent the image being edited using only the 16 default colors (the colors Windows' uses for caption bars, buttons, text, etc.).

- Black and White: The image will be displayed using only pure Black and White pixels.

- Custom number of colors: Use this item if you want a palette based image with less than 256 and more than 16 color possibilities. The default Window's colors will always be included among the set of resulting colors.

When changing the color depth of an image from True color to Palette image it is necessary to create a new palette of colors. Then, each pixel in the original image must be mapped to one of the colors in that new palette. In the process of mapping, many colors in the image will not find a perfect match among palette colors. One approach in this case is to represent the color with the palette entry that best approximates it. Another approach is to try to represent non matching colors using not one, but a group of pixels. These pixels (like colors combinations in an impressionist painting) approximate the desired color. This last approach is called Dithering, and LView Pro will use it when the "Enable Floyd-Steinberg Dithering" option is checked.

For more information about image colors, see the Graphics Mode help topic.

Retouch/Contrast Enhance

Use this dialog window to alter the image contrast. Contrast enhancement is obtained by brightening darker pixels and darkening brighter ones (to reduce contrast) or doing the opposite (to increase contrast). Contrast offsets vary from -64 (no contrast) to +64 (maximum contrast).

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Retouch/Color Balance

Use this dialog window to specify increments/decrements for Red, Green and Blue color components. The values specified are added to each image pixel representation. For instance, a pixel whose current value is RGB (10, 10, 10) will become RGB (20, 10, 10) if you move the Red scrollbar to 10 and keep the others at 0. The maximum resulting value for a color component is 255 and the minimum 0, LView Pro truncates invalid results.

Editing in True color mode is a slow process. In this mode, changes will only be performed when the "Exec" button is pressed, so you can alter more than one parameter before waiting for command execution.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Retouch/Grayscale

This command transforms a color image into grayscale. Each pixel is transformed into the gray pixel (Red = Green = Blue) with the (approximate) same luminosity. If you undo operations are enabled in Options/Interface, the original image may be restored using Edit/Undo.

This command is also available at the Toolbar.

Retouch/Negative

This command transforms a color or grayscale image into its photographic negative. Each pixel is has its luminosity (nearly) complemented. If undo operations are enabled in Options/Interface, the original image may be restored using Edit/Undo.

This command is also available at the Toolbar.

Retouch/Exp Enhance

Use this dialog window to set the desired level of Exponential enhancement. for all pixels in the image. Exponential enhancement brightens dark pixels in the image, while simultaneously reducing overall image contrast. It may not be adequate for images in general, but comes in handy for highly contrasted images.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Retouch/Gamma Correction

Use this dialog window to specify the amount of Gamma Correction to be applied to all image pixels. Gamma correction may be used to brighten or darken the image. If "Lock RGB Scrollbars" is checked, moving one scrollbar will move the other two. Otherwise, gamma correction values may be set individually for Red, Green and Blue components. Values above 0 will brighten the corresponding color component on all pixels, values bellow 0 will darken the corresponding color component on all pixels. Gamma correction may not be suitable for all images, for brightening you may experiment with other commands like Retouch/Exp Enhance, Retouch/Log Enhance and Retouch/SineH Enhance.

Editing in True color mode is a slow process. In this mode, when "Lock RGB Scrollbars" is not checked, changes will only be performed when the "Exec" button is pressed, so you can alter more than one parameter before waiting for command execution.

Click on "Cancel" to discard any changes you have made, and terminates the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Retouch/Image Filters

Use this dialog window to execute an image filter, and/or to define a new image filter specification. Image Filters perform "averaging" operations on color components of neighbor pixels. The resulting color components for any given pixel, are calculated based on the current color components of its neighbors and itself.   LView Pro defines some default fiter specifications, at the beginning of the Select Filter list box. These default specifications may be freely edited, and may be later restored by clicking on the "Defaults" button.   For best results, image filters should be applied to TRUE color images. To operate on palette based images, quantizing must be performed, and because of that color information loss may be noticeable.

The options and tools in this dialog are:

Selected Filter listbox: Select one of the filters in this list, either to edit its definition or to execute it in the current image.

Affected Color Components: Only color components (Red, Green and Blue) that are checked will be affected by filter execution. In most cases all three components should be checked.

Rename Current Filter: Allows the user to rename a filter specification to better describe its action. The first few filters in the list are initialized by LView Pro, while the remaining are intended to be defined (and renamed) the user. Notice that it is possible to edit/rename all filters, including the ones initially defined by LView Pro.

Filter Matrix: Each entry in this matrix contains a multiplier. When a filter is executed, the Filter Matrix is centered at each pixel in the image, and pixels in a 5x5 neighborhood of the center pixel (including the central pixel itself) have their color components multiplied by matrix entries. All 25 (5x5) products are added together to produce a total sum.

Division Factor: This value is utilized to divide the total sum obtained as described above. Usually, this parameter should be equal to the sum of all Filter Matrix indices, but a slightly smaller/bigger value may be used, to proportionally brighten/darken the resulting image.

Bias: The final step in applying the filter is to add the Bias parameter to the result of Total Sum / Division Factor. The value obtained here will replace the color component of the central pixel.

Click on "Default" to restore LView Pro's default filter specifications. Notice that this will overwrite the first 9 filters currently defined.

Double clicking on a filter name will make LView Pro execute that filter and end the dialog.

Click on "Exec" to execute the filter currently selected in the Selected Filter listbox.

Click on "Save" to make edited filter definitions available in future executions of this dialog.

Click on "Cancel" to terminate this dialog and discard any changes made to the image during dialog execution.

Click on "OK" to terminate this dialog and keep changes made to the image.

This command is also available at the Toolbar.

Retouch/SineH Enhance

Use this dialog window to specify the desired level of Hyperbolic Sine enhancement for all pixels in the image. Hyperbolic sine enhancement brightens dark pixels, while simultaneously increasing overall image contrast. It may not be adequate for images in general, but comes in handy for poorly contrasted images with dark areas.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Retouch/Log Enhance

Use this dialog window to specify the desired level of Logarithmic enhancement for all pixels in the image. Logarithmic enhancement brightens dark pixel, while keeping already bright ones from becoming too bright. It may not be adequate for images in general, but often produces better results than Retouch/Gamma Correction for brightening dark images.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

This command is also available at the Toolbar.

Options/Load All

Use this menu item to restores all LView Pro configuration options from the initialization file.

Options/Save All

Use this menu to save all LView Pro's current configuration options to the initialization file.

Options/Default

Use this menu to reset all LView Pro's configuration options to their "factory defaults". The options are set for the current LView Pro execution and are not saved to the initialization file To make the default options available for later execution, use the Options/Save All command.

Options/Quantizing

This dialog window is similar to the one associated to the Retouch/Color Depth command. Use is to configure the resulting color depth when loading images. When "Auto quantizing setup" in Options/Interface   is checked, LView Pro will automatically set the quantizing options adequate for your graphics card at every execution startup. Notice that "black and white" quantizing on load is not supported for JPEG images. See Options/Jped I/O for an explanation about it.   For more information see the Graphics Mode help topic.

Keyboard Accelerator Keys

Some of the most commonly functions provided by LView Pro can also be activated through special keyboard combinations called Accelerator Keys.
Bellow is a list of all Accelerator Keys recognized by LView Pro:

Client Area Scrolling (also available during <u>Selection Area</u> definition):

  - PAGE UP: one page up,
  - PAGE DN: one page down,
  - HOME: one page left,
  - END: one page right,
  - UP ARROW: one row up,
  - DOWN ARROW: one row down,
  - LEFT ARROW: one column left,
  - RIGHT ARROW: one column right

Menu Item Shortcuts:

  - ALT-BACKSPACE: <u>Edit/Undo</u>,
  - SHIFT-DEL: <u>Edit/Cut</u>
  - CONTROL-INS: <u>Edit/Copy</u>
  - SHIFT-INS: <u>Edit/Paste</u>
  - CONTROL-DEL: <u>Edit/Delete</u>
  - CONTROL-'R': <u>Edit/Resize</u>
  - CONTROL-'F': <u>Options/Full Screen</u>
  - CONTROL-'S': <u>Options/Interface</u>: Position window at: Same position
  - CONTROL-HOME: <u>Options/Interface</u>: Position window at Left&Top
  - CONTROL-END: <u>Options/Interface</u>: Position window at Left&Bottom
  - CONTROL-PAGEUP: <u>Options/Interface</u>: Position window at Right&Top
  - CONTROL-PAGEDN: <u>Options/Interface</u>: Position window at Right&Bottom
  - CONTROL-'C': <u>Options/Interface</u>: Position window at Center
  - CONTROL+'O': <u>Options/One keystroke</u>

One keystroke retouch

  - CONTROL+'K': to activate the current retouch combo selected at <u>Options/One keystroke</u>

LView Pro 1.B
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For a summary about registration procedures, see <u>Registering LView Pro</u>.

In this help topic:

The term "LView Pro" identifies release version 1.B of the LView Pro series.

The term "SHAREWARE version"   identifies the complete package containing the Microsoft Windows 3.1, Intel i386 version of LView Pro. By complete package we mean: LView Pro's executable file, associated help file, readme file and registration form files. For a complete list of these files, and their filenames, refer to the <u>Package Contents</u> help topic. The term "SHAREWARE copy" identifies an instance of the SHAREWARE version.

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Contacting the author of LView Pro and/or MMedia Research

A1: Send an email to mmedia@world.std.com, mentioning LView Pro in the subject line.

A2: Send a fax to 1-305-458-9698

A3: Write to:

    MMedia Research
    Attn: Leonardo Haddad Loureiro
    1501 East Hallandale Beach Boulevard, #254
    Hallandale,   Florida   33009
    USA

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Acknowledgments

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Tool Bar Positioning

The Tool Bar window may be positioned in three locations: to the left of LView Pro's window, to the right of LView Pro's window and at LView Pro's caption bar. The position of the Tool Bar is updated to the initialization file every time LView Pro's execution is terminated, and retrieved at its next execution startup.

To move the Tool Bar window to either side, click the left mouse button on its caption bar. To place the Tool Bar window at LView Pro's caption bar, click on the button at the Tool Bar window caption. To restore the Tool Bar window from LView Pro's caption bar, click on the tool icon at LView Pro's caption bar.

Embedded Calculator Operation

Description

LView Pro features an embedded calculator to evaluate user defined expressions. The calculator is used to evaluate expressions entered at the <u>Retouch/Interactive RGB</u> dialog window.

The calculator is a simple, yet powerful expression interpreter. It accepts C-like expressions and provides: operators, built in "scientific functions", and two pre-defined constants: "e" (base for the Napierian logarithms) and "pi" (3.1415...).

Calculator function reference

Bellow is a list of all functions supported by the calculator, and their parameters. All trigonometric functions work in radian units.

- Log (x, b): logarithm of x on base b,
- Ln (x): Napierian logarithm of x,
- Exp (x): exponential of x,
- Sin (x): sine of x,
- Cos (x): cosine of x,
- Tan (x): tangent of x,
- Cotg (x): cotangent of x,
- Sec (x): secant of x,
- Cosec (x): cosecant of x,
- Atan (x): arc whose tangent is x,
- Asin (x): arc whose sine is x,
- Acos (x): arc whose cosine is x,
- Sinh (x): hyperbolic sine of x,
- Cosh (x): hyperbolic cosine of x,
- Tanh (x): hyperbolic tangent of x,
- Abs (x): absolute value of x.

Calculator operators

Add, subtract, multiply, divide, raise to power and module: + - * / ^ %
Boolean AND and OR: && ||
C-like ternary operator: ?:

Example expressions

x^0.8 + sin (x)

-- yields x raised to 0.8 plus the sine of x.

x < 0.5 ? x : 0.5 - cos (x * pi) / 2

-- yields x if x is smaller than 0.5. Otherwise, yields 0.5 minus half of the cosine of x times pi.

x == 0.5 || (x < 0.25 && x > 0.1) ? 1 : x

-- yields 1 for values of x in the set   (0.1 .. 0.25) U {0.5}. For other values of x, yields x.

Retouch/HSV Adjust

Use this dialog to edit the Hue, Saturation and Value components for all pixels in the image. Hue is a circular value denoting the "dominant" color tendency (among Red, Green and Blue). Saturation is the amount of color (0 saturation produces a grayscale image), Value is a measure of lightness, tendency to white. For Saturation and Value, scrolling to positive values will increase the component. For Hue, the scrolling extremes will take you back to Hue == 0. HSV editing may be useful to reduce/increase the amount of color in certain images, by varying the Saturation control. The Value control may be used to brighten/darken an image, although the Retouch/Log Enhance, Retouch/Exp Enhance, Retouch/SineH Enhance and Retouch/Gamma Correction will probably do a better job. Hue is useful to adjust some images that were originally scanned with excess of yellow or green (due to bad scanner setup).

Editing in True color mode is a slow process. In this mode, changes will only be performed when the "Exec" button is pressed, so you can alter more than one parameter before waiting for command execution.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

T
This command is also available at the Toolbar.

Retouch/YCbCr Adjust

This dialog window allows for Y, Cb and Cr adjustment for all pixels in the image. The YCbCr color system is utilized for TV color broadcast in Europe. Y is known as the "luminance" component, and has no effect on pixel color, but on pixel luminosity. Cb and Cr are know as the "chrominance" components, and together define the color for each pixel. Roughly speaking, Cb and Cr represent the balance between Blue and Red in relation to Green.
As in the Retouch/HSV Adjust command, YCbCr editing may be useful to correct images that were poorly scanned (in terms of color balance). While the Y component may be used to darken/brighten the image, the commands Retouch/Log Enhance, Retouch/Exp Enhance, Retouch/SineH Enhance and Retouch/Gamma Correction will probably yield better results for that purpose.

Editing in True color mode is a slow process. In this mode, changes will only be performed when the "Exec" button is pressed, so you can alter more than one parameter before waiting for command execution.

Click on "Cancel" to discard any changes you have made, and terminate the dialog.

Click on "OK" to confirm the changes and terminate the dialog.

T
This command is also available at the Toolbar.

Package Contents

The files composing LView Pro 1.B package are:

```
lviewp1b.exe - LView Pro 1.B executable file
lviewp.hlp     - LView Pro 1.B help file
readme.txt     - General information about LView Pro 1.B
iregistr.txt   - Individual user registration form
sregistr.txt   - Site license registration form
changes.txt    - Summary of version changes

ctl3dv2.dll    - Microsoft's 3D control library 16-bit version OR
ctl3d32.dll    - Microsoft's 3D control library 32-bit version
                   to be installed at your windows\system directory
```

Registered versions of LView Pro may have different names names for the executable file lviewp1b.exe.

Please, read the help topic Installation and Troubleshooting if you have problems installing LView Pro.

Please, read the contents of the LView Pro 1.B Licensing, Registration and Distribution help topic for information about registration and general information associated with LView Pro 1.B usage.

Options/Jpeg I/O

Use this dialog to define Jpeg input and output (compression and decompression) parameters.

Decompression parameters:

LView Pro offers two modes for Jpeg decompression: Normal and Preview. You should set options that yield higher decompression quality for Normal decompression mode, and aim for speed when choosing Preview decompression options. Switching from one mode to the other is simple: use the RIGHT mouse button to click this dialog's button, at the Toolbar. The Toolbar button also provides visual information to tell which mode is currently set. When Normal mode is set, the button is painted BLUE. When Preview mode is set, the button is painted RED.

If you decide to reload a file, after loading it in Preview mode, use File/Reload. This command is also available at the Toolbar, by clicking the RIGHT mouse button on the File/Open button.

In this dialog, the mode for which options are being set is indicated at the "Jpeg decompression" title, as either "Normal" or "Preview". In order to select options for the other mode, click on the button that called "Switch to Preview mode" or "Switch to Normal mode", depending on which mode is currently being edited. The mode being edited at the time you confirm and exit this dialog (by pressing the "OK" button) will become the current decompression mode.

Because JPEG decompression offers special quantizing and dithering options, it will not perform "black and white" quantizing on load (if specified in Options/Quantizing). If color reduction to black and white is desired, it may be obtained by utilizing Retouch/Color Depth.

Load grayscale: Check this box to force Jpeg images to be loaded without color information. When this option is checked, Jpeg decompression is faster, and this feature may be useful in the Preview decompression setup.

Fast upsampling: Check this box to select a faster, but less precise upsampling algorithm, uncheck it to sligtly improve image decompression quality. Checking this option may be useful in the Preview decompression setup.

1-pass quantize: Check this box to select a faster, but less precise quantizing algorithm, uncheck it to improve image decompression quality.
This option is useful in the Preview decompression setup.

Fast dithering: Check this box to select a faster, but less precise dithering algorithm, uncheck it to improve image decompression quality.
This option is useful in the Preview decompression setup.

DCT method: Choose among three methods for computing Discrete Cosine Transforms:
    Integer accurate: Slower but accurate integer computation (recommended for the Normal setup),
    Integer fast: Faster, less accurate integer computation (recommended for the Preview setup),
    Floating point: Most accurate, but slower than the integer methods.

Scaling ratio: This option allows for loading a Jpeg file using it's full dimensions (1:1), or performing a scaling of the dimensions at load time, using either one half (1:2), one fourth (1:4) or one eight (1:8) for scaling ratio. Decompression speed rapidly increases as scaling ratio denominators grow, and this feature is certainly usefull in the Preview decompression setup.

Compression parameters:

Compression quality: Can assume values from 20 to 95. The lower(higher) the value, the smaller/(bigger) the resulting file will be, yielding greater(smaller) compression ratios. Notice that there is a tradeoff between compressed file size and posterior decompression fidelity to the original image. The bigger(smaller) the compression quality the better(worse) will be the decompressed image.

Entropy optimization: When checked, Jpeg compression will take longer to be processed   but (usually) generate slightly smaller files.

Save grayscale: Check this option when compressing a grayscale image to Jpeg format. Images stored in Jpeg grayscale format produce smaller files and are decompressed faster than images stored (in Jpeg) with color information.

Confirm before saving in grayscale format: Check this option to make LView Pro confirm each time an image is saved to Jpeg format, with the Save grayscale option checked. It is a good idea to leave this option checked, since it is possible to forget the Save grayscale option checked after saving a grayscale image. When this option is checked, LView Pro will display a confirmation message before conducting the save operation.

In the confirmation message you have the choice of confirming the save operation (if you really want to save the image in grayscale format) by clicking on "YES", canceling the save operation, by clicking on "CANCEL" or saving the image in color Jpeg format, by clicking on "NO".

Click on "OK" to confirm the options you entered, and terminate the dialog. The decompression setup being edited when you click on "OK" will become the current decompression setup.

Click on "Cancel" do discard any changes you have made, and terminate the dialog.

T

T
This command is also available at the Toolbar.

Options/Memory

When main memory is low, some functions may utilize secondary memory (temporary disk files) to process. Use this dialog window to enable or disable   temporary file usage, and to specify the directory where temporary files should be created.

Help/Diagnosis

Use this menu item to obtain information how to set up LView Pro for the current graphics mode.

Related help topics are: Help/Device Caps, Options/Quantizing, Options/Interface ("Auto quantize setup" option), Retouch/Color Depth, Help/Device Caps   and Graphics Mode.

Help/Device Caps

Use this menu item to obtain information about the display driver installed in your system. The information displayed is obtained directly from the display driver, and used by LView Pro to configure internal image displaying strategy.

Related help topics are: Help/Diagnosis, Options/Quantizing, Options/Interface ("Auto quantize setup" option), Retouch/Color Depth, Help/Diagnosis and Graphics Mode.

Help/Contents

This menu item starts the help system positioned at the help Contents topic.

T
This command is also available at the Toolbar.

Help/About LView Pro 1.B

This menu item opens a dialog window containing information about LView Pro 1.B. Related help topics are <u>Package Contents</u> and <u>LView Pro 1.B Licensing, Registration and Distribution</u>.

This command is also available at the Toolbar.

File/Multiple Open

Use this dialog window to define a list of files to be loaded by LView Pro. The selected files will be processed by the Open Destination function, also selected in this dialog. The behavior of the Open Destination function can be configured from this dialog. Multiple file operations can also be started by using the Windows' File Manager together with drag&drop operations. For information about this alternative see: <u>Multiple File Selection</u> and <u>Options/Interface</u>.

Bellow is a description of each dialog component:

- Current path: Indicates the drive and directory where the files in the left list box are located.

- Left list box: Contains a list of files that can be selected for loading. Selection commands are identical to the ones used in Windows' File Manage directory windows. Besides file names, this list box contains sub directories and drives by the end of the list. Double clicking the left mouse button on sub directory or drive names will reinitialize this list box with a file list from the selected   sub directory or drive. For instructions on how to select files, see the <u>Multiple File Selection</u> help topic. We call this list box as the DIRECTORY list. Double clicking a file in this list will add it to the SELECTION list.

- List files of type: Select here the extension for files in the DIRECTORY list.

- Right list box: Contains the list of selected files. These files will be processed by the selected Open Destination function. We call this list box as the SELECTION list. Double clicking a file in this list will remove it from the list.

- Open Destination: Select here the Open Destination function. For information about Open Destination functions, see <u>Options/Slideshow</u>, <u>Options/Contact Sheet</u>, <u>Options/Jpeg I/O</u> and <u>File/Printer Setup</u>.

- Setup button: Clicking this button will open the configuration dialog window for Open Destination function. Access to these dialog windows is also available in the <u>Options Menu</u>.

- Select All button: Selects all files in the DIRECTORY list.

- Unselect All button: Unselects all files in the DIRECTORY list.

- Add button: Adds Selected files in the DIRECTORY list to the SELECTION list.

- Remove button: Removes Selected files from the SELECTION list.

- Add All button: Adds all files in the DIRECTORY list to the SELECTION list.

- Remove All button: Removes all files from the SELECTION list.

- Load from file button: Reads a list of filenames from a text file, adds that list to the SELECTION list.

- Save to file button: Saves the SELECTION list to a text file, for posterior usage with "Load from file".

- Preview checkbox: Checking this option will make LView Pro exhibit a preview of the current file select in the DIRECTORY list or in the SELECTION list, whichever has been selected last. Unchecking will prevent preview exhibition of the current file.

- JPG Gray - Checking this option will make LView Pro exhibit previews of JPEG files in grayscale. Previewing JPEG files in grayscale is slightly faster than previewing in color. Unchecking will allow JPEGs to be previewed in color (if the JPEG file contains color information).

- Delete button: Deletes from the disk (after confirmation) all files currently in the SELECTION list.

Click on "Cancel" to end this dialog window and discard all selections made.

Click on "OK" to begin the multiple file open operation on files in the SELECTION list.

This command is also available at the Toolbar.

Retouch/Palette Entry

This menu item activates the Palette Entry Color Dialog where one of the palette entries is selected for edition. If a palette entry is selected, the 24-bit Color Dialog is opened next, to obtain the new specification for the selected entry. If the latter dialog is confirmed, the palette entry is altered to the new specification, and the image is re-drawn. Related help topics are: Graphics Mode, Retouch/Color Depth and Options/Quantizing.

This command is only available for color palette based images.

It is possible to select the desired palette entry by clicking the mouse on one of the pixels in the image. Exit this dialog by clicking the "Dropper" button, and then click the left mouse button on a pixel. The corresponding palette entry will be selected the next time you open this dialog.

To cancel this command, click "Cancel" in either color dialog.

This command is also available at the Toolbar.

Palette Entry Color Dialog

This dialog window exhibits all color palette entries utilized in the current image. One of the palette entries is the "current selected entry", and is displayed surrounded by a small rectangle. The index of the current selected entry, as well as the RGB values it specifies are exhibited in the "Current selection info" area. The available commands in this dialog are:

- Mask current selection using: when checked will make LView Pro exhibit the current image using the current selected entry as a mask. Pixels in the current image that correspond to the current selected entry will be painted using the color specified in that entry, all other pixels will either be painted black or white. Unchecking this option will make LView Pro exhibit the current image unchanged.

- Black: When selected makes LView Pro exhibit masked pixels using the color black.

- White: When selected makes LView Pro exhibit masked pixels using the color white.

Select one of the entries by clicking the left mouse button on it, and then clicking on the "OK" button, or by double clicking the left mouse button on any of the palette entries.

To cancel the selection, click on "Cancel".

Frequently Asked Questions

This help topic provides answers and/or indicates which help topics contain answers for some frequently asked questions.

Q1: Why do colors look wrong when I load an image?

A1: Your graphics card may not be able to do better than that. Check the Graphics Mode help topic for information on graphics cards capabilities and related issues.

A2: If your graphics card can display at least 256 simultaneous colors, you still have to check if the display driver selected at Windows' Setup allows for 256 color representation.

A3: Another possibility is that LView Pro is not trying to auto configure its quantizing options. Check if "Auto quantize setup" is checked in Options/Interface.

A4: If everything else failed, it may be the case that LView Pro is not receiving correct information from the display driver. Check Help/Device Caps and Help/Diagnosis and see if they provide the information you would expect. If not, try unchecking "Auto quantize setup" in Options/Interface, and set Options/Quantize manually with for characteristics you believe your card (and driver) are set to provide.

Q2: Why is the menu item (and ToolBar button) Retouch/Palette Entry always disabled?

A: Your graphics card must be operating in True or High color mode. Check Help/Device Caps for a confirmation on that. If so, LView Pro is loading 24-bit/pixel images without (unnecessary) palette information. The Retouch/Palette entry command is only available when the image being edited is palette based (check Graphics Mode for an explanation about these terms). If you want to use this command, you can use Retouch/Color Depth and transform the image into a palette based image. Be aware that if the original image is stored in 24-bit/pixel format, image quality will be lost in the process.

Q3: Why is it better to use Retouch/Image Filters on TRUE color images?

A1: Image filters will compute new color values for each pixel in the image. Even if the original image only has 256 colors (or less), the resulting image may be composed of thousands (or millions) of colors. When you use Retouch/Image Filters on a palette based image, LView Pro assumes that the result should also be a palette based image. To produce that result, LView Pro will quantize intermediate and final results, to match the number of colors in the original image.

A2: If your card can work in True or High color modes, and the image you are editing is palette based (such as images produced from GIF files), you should first use Retouch/Color Depth and promote it to True Color, and then use Retouch/Image Filters. LView Pro will then assume that resulting images should also be represented in TRUE color, and execute the image filters faster and with more precision. If you need to save the image in a palette based format, you can always use Retouch/Color Depth, after you are done with filter editing, and transform the image back to palette based format.

Q4: Will the image format 'XYZ' be supported by LView Pro?

A1: LView Pro already supports the most commonly used image formats in the Windows/PC environment. That doesn't mean that new image formats will not be added, but searching for good specifications on image file formats is time consuming and the priority for these enhancements is not high.

A2: If you want to contribute and produce either clear documentation about a particular file format, or provide source code to read and write files in this format into/from Windows DIB format, I'll gladly add it to LView Pro. It is very easy to plug in another file reader/writer module.

Q5: Why are there so many commands to edit brightness and contrast?

A1: Video monitors display images with different brightness and contrast sensibilities. The same image, viewed in different monitors may look darker in one and brighter in the other. One solution is to regulate the contrast/brightness controls on the monitor. But, given the degree of flexibility provided LView Pro for by image editing, it may be better to adjust the image representation instead, The problem is that a single algorithm is not effective for all images. That's why LView Pro provides many (very) different algorithms for contrast/brightness adjustment. Some work only on brightness, like Retouch/Gamma Correction, or only on contrast, like Retouch/Contrast Enhance. Other commands alter both brightness and contrast, like Retouch/Exp Enhance, Retouch/Log Enhance and Retouch/SineH Enhance. It is only though experimentation that you will learn which one should be used on a given image.

A2: Brightness and contrast commands all use color mappings to produce their effect. You can develop your own mappings using the Retouch/Interactive RGB, either by drawing curves, or by specifying algebraic functions. Exp, Log and SineH enhancement commands were developed through experimentation with this command.

A3: It is often a good approach to use more than one editing function on the same image. By combining the effect of different enhancement functions, one after the other, the resulting image may look more "natural".

Q6: Can LView Pro process files from the command line?

A1: Yes. LView Pro will load each file specified in the command and perform a Slideshow, using the currently set Options/Slideshow options.

A2: Passing a file with extension .TXT on the command line will make LView Pro read file names from that file. The .TXT file may be created using Windows' Notepad. Each file name in the .TXT file must be in a separate line.

Q7: How can I start a slideshow/contact sheet/batch compression/batch printout?

A1: One way to perform these operations is by using Windows' File Manager together with Drag&Drop operations. See the help topic Multiple File Selection for information on how to do it.

A2: Another way is to use File/Multiple Open.

Q8: How can I get help to solve a problem not covered by this help system?

A: Write email to mmedia@world.std.com, mentioning LView Pro in the subject line. You will receive an answer.

Q9: How can I get help to solve a problem covered by this help system ... but I just could not find the answer???

A: Same answer as in Q8, but in this case you will receive a list of help topics related to the problem in question.

Q10: Do I need to register to use LView Pro (do I need to pay a fee?) ?

A1: If you are an individual or home user, utilizing LView Pro shareware version   for leisure purposes, you do not need to pay fees or register.

A2: If you are an individual or home user, you may wish to register and obtain a version of the software customized for Microsoft Win32s and Windows NT, Intel 486 and Pentium. Take a look at the help topic Performance Comparisons.

A3: If you are an individual or home user, utilizing LView Pro for work related purposes, you need to fill out and send an "Individual User Registration Form" together with the appropriate fee.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q11: Is it OK to upload LView Pro to a local BBS/FTP site/Usenet newsgroup?

A: Yes, the restriction being that a BBS cannot charge special fees for downloading LView Pro. Flat rate connection fees are (obviously) allowed.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q12: Is it OK to upload LView Pro to a private BBS/Electronic site maintained by the company I work for?

A: Yes, provided that your company does not utilize LView Pro for commercial purposes or as a work related tool.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q13: Can LView Pro be included in a CD-ROM/diskette/similar media accompanying a book/magazine/similar?

A: Yes, provided that the publisher/author of the book/magazine has previously contacted the author of LView Pro to obtain a "Non-exclusive Distribution License Agreement" signed by the author of LView Pro.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q14: Can LView Pro be utilized for commercial purposes or as a work related tool in my business/in the company I work for?

A: Yes, provided that an authorized employee has filled out a "Site License Registration Form" and mailed it to LView Pro's author together with the appropriate fee.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q15: Can LView Pro be included in a commercial software package?

A: Yes, provided that the software distributor   has previously contacted the author of LView Pro to obtain a "Non-exclusive Distribution License Agreement" signed by both parties.

Check the help topics: LView Pro 1.B Licensing, Registration and Distribution and Disclaimer.

Q16: How do I contact MMedia Research and/or the author of LView Pro?

A1: Send an email to mmedia@world.std.com, mentioning LView Pro in the subject line.

A2: Send a fax to 1-305-458-9698

A3: Write to:

      MMedia Research
      Attn: Leonardo Haddad Loureiro
      1501 East Hallandale Beach Boulevard, #254
      Hallandale, Florida 33009
      USA

Retouch/Interactive RGB

This dialog window allows for definition and execution of arbitrary user defined transformation maps for the Red, Green and Blue, color components of all pixels in the image. Transformation maps are functions of a single variable yielding a single result. An example of a map is 2*x, which simply doubles the value of original color components. In this dialog, Red, Green and Blue are treated like real (floating point) numbers ranging from 0 to 1. This domain facilitates the usage of LView Pro's embedded calculator functions.

If you do not want to define a map in algebraic terms, you may still draw a curve representing the desired transformation using the mouse, and unchecking the "Use Functions" checkbox.

LView Pro stores up to 20 map definitions in its initialization file. The first 10 maps are pre-defined by LView Pro (but can be edited and customized by the user). Interactive RGB comes in handy when dealing with images for which none of the pre-defined Retouch Menu commands produces satisfactory results. Mappings for some of the Retouch commands (Retouch/Log Enhance, Retouch/Exp Enhance and Retouch/SineH Enhance) were actually "discovered" through experimentation with Interactive RGB. For examples on how expression definition, and a list of available functions and operators, see the Embedded Calculator Operations help topic.

Options and tools in this dialog are:

The Map Graph window: Exhibits a graphical representation of the selected map, and allows for interactive definition (by drawing with the mouse) of a map.

Ordering: Choose "None" if you do not want the mapping to be non-decreasing nor non-increasing. Choose "Increasing" if you do not want to allow f(x) < f(y) for x > y.
Choose "Decreasing" if you do not want to allow f(x) > f(y) for x > y. Decreasing maps may be utilized to produce image photographic negative effects.

Lock RGB Graphs: Check this box if you want a single function definition, or map drawing to be utilized for Red, Green and Blue components. Uncheck this box if you want to define separate functions or map drawings for each component. Using different maps for different components may help correct color component unbalancing.

Use Functions: This item is automatically unchecked whenever drawing is done in the Map Graph Window. When this item is unchecked, LView Pro will not consider the current function expression exhibited in the Select Function list box. When this item is checked, LView Pro will use the function definition exhibited in the Select Function list box.

Select Function listbox: Choose one of the pre-defined functions definitions for edition or to define the map in the Map Graphic Window.

Edit Function definition: Click on this button to replace the function definition for the current item exhibited in the Select Function listbox.

Color Component: Choose which color component function will be visible in the Map Graphic Window, and editable by drawing or typing in function definitions. If Lock RGB Graphs is unchecked, each color component will store its own definition.

Click on "Exec" to execute the current Interactive RGB setup.

Click on "Save" to make edited function definitions available in future executions of this dialog.

Click on "Cancel" to terminate this dialog and discard changes made to the image.

Click on "OK" to terminate this dialog and keep changes made to the image.

This command is also available at the Toolbar.

Options/Interface

Several interface options are configured in this dialog window. With few exceptions, these options usually are configured after installation, and remain unchanged afterwards. Bellow is an individual description for each option.

- Enable undo: LView Pro will reserve memory for undo buffers if this option is checked. In systems where main memory is relatively small, or if you edit very large images, you may turn this option off or LView Pro will frequently run out of memory. The command Edit/Undo will not be available while this option is off.

- Auto quantize setup: If this option is on, LView Pro will automatically choose the adequate way for loading images in the current graphics mode. This setup is done every time LView Pro is loaded, and you will be prompted to accept any necessary changes. If this option is off, LView Pro will use the parameters set in the Options/Quantizing dialog. Related help topics are: Graphics Mode, Retouch/Color Depth, Retouch/Palette Entry, Help/Device Caps and Help/Diagnosis.

- Window auto-resize: Checking this option will make LView Pro resize its window to fit the current editing image dimensions. When a perfect fit is not possible, scrollbars will be available, if the Options/Show Scroll Bars menu item is checked. Unchecking this option will prevent LView Pro from automatically changing the dimensions of its window.

- Show scroll bars: When this option is checked, LView Pro will display scroll bars whenever the current editing image cannot be fully displayed inside LView Pro's client area. If this option is unchecked scroll bars will not be exhibited. Scrolling will still be possible during Selection Area definition and through   the usage of Keyboard Accelerator Keys.

- Thick Selection Area frame: This option controls the width utilized for Selection Area borders. Check it to specify a thicker and easier to move/drag area frame. If this item is unchecked, the Selection Area border width and height will be set to one pixel.

- Animate Selection Area frame: If this option is checked, Selection Area frames are animated for easier operation. Uncheck to turn animation off.

- Show ToolBar legends: Check this option and LView Pro will exhibit a legend explaining the function of ToolBar buttons, whenever the mouse pointer stays positioned over one of these buttons for a short while.

- Confirm all save operations: Check this option receive a confirmation message from LView Pro before saving images to the disk. If this option is unchecked, LView Pro will not confirm before saving an image when you select File/Save or click on the correspondent icon in the Tool Bar. When saving images in Jpeg grayscale format, a confirmation prompt may be exhibited regardless of this option's selection state. See Options/Jpeg I/O for more information about confirming image save operations in Jpeg grayscale format.

- Open icon after load: Check this option if you want LView Pro to restore its window (if the window was minimized) when an image load operation is completed. Uncheck it if you prefer LView Pro to remain minimized.

- Show thumbnails on icon: Check this option if you want LView Pro to exhibit a thumbnail of the image being edited instead of LView Pro's icon. Uncheck if you prefer LView Pro to always exhibit its original icon when minimized,

- Drag&Drop destination: Selects which Open Destination function will process multiple file selections dropped to LView Pro's window or icon. For more information, see Multiple File Selection and File/Multiple Open.

- Image resize on load: LView Pro may optionally resize images upon load. Check 'Never' if you do not want to use this feature, 'Only to shrink' if you only to resize images larger or wider than the maximum client window, 'Only to enlarge' if you want images smaller than the maximum client window to be enlarged, or 'Always' to resize all images upon load.

- Position window at: Selects the position where LView Pro will place its window every time an image is loaded or image dimensions are changed. Choose among the desktop corners, the desktop center, or

select 'Same position' if you do not want to use this feature.

- Clipboard copy format: LView Pro may utilize one of two formats when copying images to the Clipboard:

    . Device Independent Bitmap (DIB) format. This is the recommended format to fully describe an image in terms of color resolution, independent of the current graphics mode. This is also the format used in Windows BMP files.

    . Device Dependent Bitmap (DDB) format. Some applications do not support the DIB format when pasting from the Clipboard. Use this option only when generating a Clipboard image to be pasted into one of these applications.

When pasting from the Clipboard, LView Pro will look first for data in DIB format. In the absence of DIB data, if a DDB is present LView Pro will paste it and convert it into DIB format. For more information see Edit/Paste.

T
This command is also available at the Toolbar.

File/Reopen

This menu item re-loads the last file loaded by LView Pro. This may be useful after previewing a Jpeg file and switching to Normal decompression mode. See Options/Jpeg I/O for an explanation about decompression modes.

T
This command is also available at the Toolbar (click with the RIGHT mouse button!).

Contact Sheet Preview

This dialog allows for interactive positioning and sizing of the contact sheet thumbnails. See <u>Options/Contact Sheet</u> for information about contact sheet setup.

In this dialog, use the left mouse button to click and drag thumbnails on the Preview Window. Individual thumbnails may be resized by clicking and dragging on their frame edges (watch the mouse pointer change its shape when positioned over an edge). Whenever a thumbnail is clicked on, the information associated with it is exhibited at the bottom of the dialog window (file name, original dimensions, upper left corner on contact sheet, thumbnail dimensions, image file format). The thumbnail whose information is currently being shown is painted with a red frame.

By using the Global resize scrollbar, you can enlarge or shrink all thumbnails simultaneously. Choose percentages bellow 100% to shrink and above 100% to enlarge. Notice that after a global resize is performed, the scrollbar is repositioned at 100% and subsequent resize percentages will be relative to the current thumbnail sizes.

The file name associated with each thumbnail is exhibited in a rectangular frame bellow it. File name frames are painted blue when the frame width is sufficient to represent the whole file name string. When the frame width is too small, file name frames are painted green, to indicate that the corresponding thumbnail should be enlarged.

Click on "Reset" to restore all thumbnail positions and sizes to their initial   values.

Click on "OK" to accept the current preview setup and build the Contact Sheet.

Click on "Cancel" to discard all editions you have made and cancel the operation.

JPEG Frequently Asked Questions

This help topic and associated sub-topics were extracted from the article named "JPEG image compression: Frequently Asked Questions" posted to Usenet on 26 Jun 1994. This article is maintained by Tom Lane of the Independent JPEG Group, and updated versions of it are posted every two weeks. I would like to thank Tom for granting permission to select and reproduce parts of the FAQ.

If you have more questions about JPEG in general or the free JPEG software in particular, contact the Independent JPEG Group at jpeg-info@uunet.uu.net.

What is JPEG?
Why use JPEG?
When should I use JPEG, and when should I stick with GIF?
How well does JPEG compress images?
What are good "quality" settings for JPEG?
If you are looking for source code to work with
What's all this hoopla about color quantization?
What are some rules of thumb for converting GIF images to JPEG?
Does loss accumulate with repeated compression/decompression?
Why all the argument about file formats?
How does JPEG work?
Isn't there a lossless JPEG?
Could an FPU speed up JPEG?   How about a DSP chip?
Where can I get the latest JPEG FAQ?

What is JPEG?

JPEG (pronounced "jay-peg") is a standardized image compression mechanism.
JPEG stands for Joint Photographic Experts Group, the original name of the committee that wrote the standard.

JPEG is designed for compressing either full-color or gray-scale images of natural, real-world scenes.   It works well on photographs, naturalistic artwork, and similar material; not so well on lettering, simple cartoons, or line drawings.   JPEG handles only still images, but there is a related standard called MPEG for motion pictures.

JPEG is "lossy," meaning that the decompressed image isn't quite the same as the one you started with.   (There are lossless image compression algorithms, but JPEG achieves much greater compression than is possible with lossless methods.)   JPEG is designed to exploit known limitations of the human eye, notably the fact that small color changes are perceived less accurately than
small changes in brightness.   Thus, JPEG is intended for compressing images that will be looked at by humans.   If you plan to machine-analyze your images, the small errors introduced by JPEG may be a problem for you, even if they are invisible to the eye.

A useful property of JPEG is that the degree of lossiness can be varied by adjusting compression parameters.   This means that the image maker can trade off file size against output image quality.   You can make *extremely* small files if you don't mind poor quality; this is useful for applications like indexing image archives.   Conversely, if you aren't happy with the output quality at the default compression setting, you can jack up the quality until you are satisfied, and accept lesser compression.

Another important aspect of JPEG is that decoders can trade off decoding speed against image quality, by using fast but inaccurate approximations to the required calculations. Until recently, most publicly available JPEG code has adopted a best-possible-quality philosophy, but we are now starting to see the appearance of viewers that give up some image quality in order to obtain significant speedups.

Why use JPEG?

There are two good reasons: to make your image files smaller, and to store 24-bit-per-pixel color data instead of 8-bit-per-pixel data.

Making image files smaller is a big win for transmitting files across networks and for archiving libraries of images.   Being able to compress a 2 Mbyte full-color file down to 100 Kbytes or so makes a big difference in disk space and transmission time!   (If you are comparing GIF and JPEG, the size ratio is more like four to one.   More details in section 4.)

If your viewing software doesn't support JPEG directly, you'll have to convert JPEG to some other format for viewing or manipulating images.   Even with a JPEG-capable viewer, it takes longer to decode and view a JPEG image than to view an image of a simpler format such as GIF.   Thus, using JPEG is essentially a time/space tradeoff: you give up some time in order to store or transmit an image more cheaply.

It's worth noting that when network or phone transmission is involved, the   time savings from transferring a shorter file can be greater than the extra time needed to decompress the file.

The second fundamental advantage of JPEG is that it stores full color information: 24 bits/pixel (16 million colors).   GIF, the other image format widely used on Usenet, can only store 8 bits/pixel (256 or fewer colors). GIF is reasonably well matched to inexpensive computer displays --- most run-of-the-mill PCs can't display more than 256 distinct colors at once.   But full-color hardware is getting cheaper all the time, and JPEG images look *much* better than GIFs on such hardware.   Within a couple of years, 8-bit GIF will seem as obsolete as black-and-white MacPaint format does today.   Furthermore, for reasons detailed in section 7, JPEG is far more useful than GIF for exchanging images among people with widely varying display hardware.   Hence JPEG is considerably more appropriate than GIF for use as a Usenet posting standard.

A lot of people are scared off by the term "lossy compression".   But when it comes to representing real-world scenes, *no* digital image format can retain all the information that impinges on your eyeball.   By comparison with the real-world scene, JPEG loses far less information than GIF.   The technical meaning of "lossy" has nothing to do with this, though; it refers to loss of information over repeated compression cycles, a problem that you may or may not care about.   (If you do, see "Does loss accumulate with repeated compression/decompression?")

When should I use JPEG, and when should I stick with GIF?

JPEG is *not* going to displace GIF entirely; for some types of images, GIF is superior in image quality, file size, or both.   One of the first things to learn about JPEG is which kinds of images to apply it to.

Generally speaking, JPEG is superior to GIF for storing full-color or gray-scale images of "realistic" scenes; that means scanned photographs and similar material.   Any continuous variation in color, such as occurs in highlighted or shaded areas, will be represented more faithfully and in less space by JPEG than by GIF.

GIF does significantly better on images with only a few distinct colors, such as line drawings and simple cartoons.   Not only is GIF lossless for such images, but it often compresses them more than JPEG can.   For example, large areas of pixels that are all *exactly* the same color are compressed very efficiently indeed by GIF.   JPEG can't squeeze such data as much as GIF does without introducing visible defects.   (One implication of this is that large single-color borders are quite cheap in GIF files, while they are best avoided in JPEG files.)

Computer-drawn images (ray-traced scenes, for instance) usually fall between photographs and cartoons in terms of complexity.   The more complex and subtly rendered the image, the more likely that JPEG will do well on it. The same goes for semi-realistic artwork (fantasy drawings and such).

JPEG has a hard time with very sharp edges: a row of pure-black pixels adjacent to a row of pure-white pixels, for example.   Sharp edges tend to come out blurred unless you use a very high quality setting.   Edges this sharp are rare in scanned photographs, but are fairly common in GIF files: borders, overlaid text, etc.   The blurriness is particularly objectionable with text that's only a few pixels high.   If you have a GIF with a lot of small-size overlaid text, don't JPEG it.

Plain black-and-white (two level) images should never be converted to JPEG; they violate all of the conditions given above.   You need at least about 16 gray levels before JPEG is useful for gray-scale images.   It should also be noted that GIF is lossless for gray-scale images of up to 256 levels, while JPEG is not.

If you have a large library of GIF images, you may want to save space by converting the GIFs to JPEG.   This is trickier than it may seem --- even when the GIFs contain photographic images, they are actually very poor source material for JPEG, because the images have been color-reduced. Non-photographic images should generally be left in GIF form.   Good-quality photographic GIFs can often be converted with no visible quality loss, but only if you know what you are doing and you take the time to work on each image individually.   Otherwise you're likely to lose a lot of image quality or waste a lot of disk space ... quite possibly both.   Read sections "<u>What's all this hoopla about color quantization?</u>" and "<u>What are some rules of thumb for converting GIF images to JPEG?</u>" if you want to convert GIFs to JPEG.

How well does JPEG compress images?

Very well indeed, when working with its intended type of image (photographs and suchlike).   For full-color images, the uncompressed data is normally 24 bits/pixel.   The best known lossless compression methods can compress such data about 2:1 on average. JPEG can typically achieve 10:1 to 20:1 compression without visible loss, bringing the effective storage requirement down to 1 to 2 bits/pixel.   30:1 to 50:1 compression is possible with small to moderate defects, while for very-low-quality purposes such as previews or archive indexes, 100:1 compression is quite feasible.   An image compressed 100:1 with JPEG takes up the same space as a full-color one-tenth-scale thumbnail image, yet it retains much more detail than such a thumbnail.

For comparison, a GIF version of the same image would start out by sacrificing most of the color information to reduce the image to 256 colors (8 bits/pixel).   This provides 3:1 compression.   GIF has additional "LZW" compression built in, but LZW doesn't work very well on typical photographic data; at most you may get 5:1 compression overall, and it's not at all uncommon for LZW to be a net loss (less than 3:1 overall compression). When a JPEG file is made from full-color data, using a quality setting just high enough to prevent visible loss, the JPEG will typically be a factor of four or five smaller than a GIF file made from the same data.

Gray-scale images do not compress by such large factors.   Because the human eye is much more sensitive to brightness   variations than to hue variations, JPEG can compress hue data more heavily than brightness (gray-scale) data. A gray-scale JPEG file is generally only about 10%-25% smaller than a full-color JPEG file of similar visual quality.   But the uncompressed gray-scale data is only 8 bits/pixel, or one-third the size of the color data, so the calculated compression ratio is much lower.   The threshold of visible loss is often around 5:1 compression for gray-scale images.

The exact threshold at which errors become visible depends on your viewing conditions. The smaller an individual pixel, the harder it is to see an error; so errors are more visible on a computer screen (at maybe 70 dots/inch) than on a high-quality color printout (300 or more dots/inch). Thus a higher-resolution image can tolerate more compression ... which is fortunate considering it's much bigger to start with.   The numbers quoted above are typical for screen viewing.   Also note that the threshold of visible error varies considerably across images.

What are good "quality" settings for JPEG?

Most JPEG compressors let you pick a file size vs. image quality tradeoff by selecting a quality setting.   There seems to be widespread confusion about the meaning of these settings.   "Quality 95" does NOT mean "keep 95% of the information", as some have claimed.   The quality scale is purely arbitrary; it's not a percentage of anything.

In fact, quality scales aren't even standardized across JPEG programs.   The quality settings discussed in this article apply to the free JPEG software described in section "If you are looking for source code to work with", and to many programs based on it.   Other JPEG implementations, notably Apple's and HSI's, use completely different quality scales; for instance, Apple's scale covers 0-4, not 0-100.   Some programs don't even provide a numeric scale, just "high"/"medium"/"low"-style choices.   (Fortunately, this doesn't prevent different implementations from exchanging compressed files.)

In most cases the user's goal is to pick the lowest quality setting, or smallest file size, that decompresses into an image indistinguishable from the original.   This setting will vary from one image to another and from one observer to another, but here are some rules of thumb.

For good-quality, full-color source images, the default quality setting (Q 75) is very often the best choice.   This setting is about the lowest you can go without expecting to see defects in a typical image.   Try Q 75 first; if you see defects, then go up.

If the image was less than perfect quality to begin with, you might be able to drop down to Q 50 without objectionable degradation.   On the other hand, you might need to go to a *higher* quality setting to avoid further loss. Q 85 to 95 is often best for converting GIFs (see section "What are some rules of thumb for converting GIF images to JPEG?" for more info).

Except for experimental purposes, never go above about Q 95; using Q 100 will produce a file two or three times as large as Q 95, but of hardly any better quality.   If you see a file made with Q 100, it's a pretty sure sign that the maker didn't know what he/she was doing.

If you want a very small file (say for preview or indexing purposes) and are prepared to tolerate large defects, a Q setting in the range of 5 to 10 is about right.   Q 2 or so may be amusing as "op art".

If you are looking for source code to work with

Free, portable C code for JPEG compression is available from the Independent JPEG Group, which I lead.   A package containing our source code, documentation, and some small test files is available from ftp.uu.net (192.48.96.9) in directory /graphics/jpeg.   The current release is v4, file jpegsrc.v4.tar.Z.   (This is a compressed TAR file; don't forget to retrieve in binary mode.)   You can retrieve this file by FTP or UUCP.   Copies can also be found at many other Internet sites.   If you are on a PC and don't know how to cope with .tar.Z format, you may prefer ZIP format, which you can find at Simtel20 and mirror sites (see NOTE above), file msdos/graphics/jpegsrc4.zip.   This file is also available on CompuServe, in the GRAPHSUPPORT forum (GO PICS), library 15, as jpsrc4.zip.   If you have no FTP access, you can retrieve the source from your nearest comp.sources.misc archive; version 4 appeared as issues 55-72 of volume 34.

The free JPEG code provides conversion between JPEG "JFIF" format and image files in GIF, PBMPLUS PPM/PGM, Utah RLE, and Truevision Targa file formats. The core compression and decompression modules can easily be reused in other programs, such as image viewers. The package is highly portable; we have tested it on many machines ranging from PCs to Crays.

We have released this software for both noncommercial and commercial use. Companies are welcome to use it as the basis for JPEG-related products. We do not ask a royalty, although we do ask for an acknowledgement in product literature (see the README file in the distribution for details). We hope to make this software industrial-quality --- although, as with anything that's free, we offer no warranty and accept no liability.

The Independent JPEG Group is a volunteer organization; if you'd like to contribute to improving our software, you are welcome to join.

Note from LView Pro's author: LView Pro utilizes the   free JPEG code provided by the Independent JPEG Group in all operations related to JPEG compression and decompression. I would like to   thank   the IJG for   producing and maintaining   this JPEG library.

A different free JPEG implementation, written by the PVRG group at Stanford, is available from havefun.stanford.edu in directory pub/jpeg.   This program is designed for research and experimentation rather than production use; it is slower, harder to use, and less portable than the IJG code, but it implements a larger subset of the JPEG standard.

What's all this hoopla about color quantization?

Most people don't have full-color (24 bit per pixel) display hardware. Typical display hardware stores 8 or fewer bits per pixel, so it can display 256 or fewer distinct colors at a time.   To display a full-color image, the computer must choose an appropriate set of representative colors and map the image into these colors.   This process is called "color quantization". (This is something of a misnomer; "color selection" or "color reduction" would be a better term.   We're stuck with the standard usage though.)

Clearly, color quantization is a lossy process.   It turns out that for most images, the details of the color quantization algorithm have *much* more impact on the final image quality than do any errors introduced by JPEG itself (except at the very lowest JPEG quality settings).   Making a good color quantization algorithm is a black art, and no single algorithm is best for all images.

Since JPEG is a full-color format, converting a color JPEG image for display on 8-bit-or-less hardware requires color quantization.   The speed and image quality of a JPEG viewer running on such hardware are largely determined by its quantization algorithm.   You'll see great variation in image quality among viewers on 8-bit displays, much more than occurs on 24-bit displays.

On the other hand, a GIF image has already been quantized to 256 or fewer colors.   (A GIF *does* have a specific number of colors in its palette, and the format doesn't allow more than 256 palette entries.)   GIF has the advantage that the image maker precomputes the color quantization, so viewers don't have to; this is one of the things that make GIF viewers faster than JPEG viewers.   But this is also the *disadvantage* of GIF: you're stuck with the maker's quantization.   If the maker quantized to a different number of colors than what you can display, you'll either waste display capability or have to quantize again to further reduce the number of colors (which results in much poorer image quality than if you had quantized once from a full-color image).   Furthermore, if the maker didn't use a high-quality color quantization algorithm, you're out of luck --- the image is ruined.

For this reason, JPEG promises significantly better image quality than GIF for all users whose machines don't match the image maker's display hardware. JPEG's full color image can be quantized to precisely match the viewer's display hardware.   Furthermore, you will be able to take advantage of future improvements in quantization algorithms (there is a lot of active research
in this area), or purchase better display hardware, to get a better view of JPEG images you already have.   With a GIF, you're stuck forevermore with what was sent.

A growing number of people have better-than-8-bit display hardware already: 15-bit "hi-color" PC displays, true 24-bit displays on workstations and Macintoshes, etc.   For these people, GIF is already obsolete, as it cannot represent an image to the full capabilities of their display.   JPEG images can drive these displays much more effectively.

In short, JPEG is an all-around better choice than GIF for representing photographic images in a machine-independent fashion.

It's sometimes thought that a JPEG converted from a GIF shouldn't require color quantization.   This is false: even when you feed a 256-or-less-color GIF into JPEG, what comes out of the decompressor is not 256 colors, but thousands of colors.   This happens

because JPEG's lossiness affects each pixel a little differently, so two pixels that started with identical colors will usually come out with slightly different colors.   Each original color gets "smeared" into a group of nearby colors.   Therefore quantization is always required to display a color JPEG on a colormapped display, regardless of the image source.

The same effect makes it nearly meaningless to talk about the number of colors used by a JPEG image.   Even if you tried to count the number of distinct pixel values, different JPEG decoders would give you different results because of roundoff error differences.   I occasionally see posted images described as "256-color JPEG".   This tells me that the poster (a) hasn't read this FAQ and (b) probably converted the JPEG from a GIF. JPEGs can be classified as color or gray-scale, but number of colors just isn't a useful concept for JPEG, any more than it is for a real photograph.

What are some rules of thumb for converting GIF images to JPEG?

Converting GIF files to JPEG is a tricky business --- you are piling one set of limitations atop a quite different set, and the results can be awful. Certainly a JPEG made from a GIF will never be as good as a JPEG made from true 24-bit color data.   But if what you've got is GIFs, and you need to save space, here are some hints for getting the best results.

With care and a clean source image, it's often possible to make a JPEG of quality equivalent to the GIF.   This does *not* mean that the JPEG looks identical to the GIF --- it probably won't on an 8-bit display, because the color quantization process used to display the JPEG won't exactly match the GIF's quantization.   (See section "<u>What's all this hoopla about color quantization?</u>" for more about that.)   But given a good viewer, the JPEG will look as good as the GIF.   Some people claim that on 24-bit displays, a carefully converted JPEG can look better than the GIF source, because dither patterns have been eliminated. (More about dithering in a moment.)

On the other hand, JPEG conversion *will* degrade an unsuitable image or one that is converted carelessly.   If you are not willing to take the amount of trouble suggested below, you're much better off leaving your GIF images alone.   Simply cranking the JPEG quality setting up to a very high value wastes space (which defeats the whole point of the exercise...) and some images will be degraded anyway.

The first rule is never to convert an image that's not appropriate for JPEG (see section 3 about that).   Large, high-visual-quality photographic images are usually the best material. And they take up lots of space in GIF form, so they offer significant potential space savings.   (A good rule of thumb is not to bother converting any GIF that's much under 100 Kbytes; the potential space savings isn't worth the hassle.)

The second rule is to look at each JPEG, to make sure you are happy with it, before throwing away the corresponding GIF; this will give you a chance to re-do the conversion with a higher quality setting if necessary.   Also compare the file sizes --- if the image isn't suitable JPEG material, a JPEG file of reasonable quality may come out *larger* than the GIF.

The third rule is to get rid of the border.   Many people have developed an odd habit of putting a large single-color border around a GIF image. While useless, this is nearly free in terms of storage cost in GIF files. It is NOT free in JPEG files, either in storage space or in decoding time; and the sharp border boundary can create visible artifacts ("ghost" edges). Furthermore, when viewing a bordered JPEG on an 8-bit display, the quantizer will think the border color is important because there's so much of it, and hence will waste color palette entries on the border, thus actually reducing the displayed quality of the main part of the image!   So do yourself a favor and crop off any border before JPEGing.

Gray-scale images usually convert without much problem.   When using cjpeg, be sure to specify -gray.   (Otherwise, cjpeg treats a GIF as color data; this works but wastes space and time if the image is really only gray-scale.) Quality settings around the default (75) are usually fine.

Color images are much trickier.   Color GIFs of photographic images are usually "dithered"

to fool your eye into seeing more than the 256 colors that GIF can actually store.   If you enlarge the image, you will find that adjacent pixels are often of significantly different colors; at normal size the eye averages these pixels together to produce the illusion of an intermediate color value.   The trouble with dithering is that, to JPEG, it looks like high-spatial-frequency color noise; and JPEG can't compress noise very well.   The resulting JPEG file is both larger and of lower image quality than what you would have gotten from JPEGing the original full color image (if you had it).   To get around this, you need to "smooth" the GIF image before compression.   Smoothing averages together nearby pixels, thus approximating the color that you thought you saw anyway, and in the process getting rid of the rapid color changes that give JPEG trouble.   Proper use of smoothing will both reduce the size of the compressed file and give you a better-looking output image than you'd get without smoothing.

With the V4 free JPEG software (or programs based on it), a simple smoothing capability is built in.   Try "-smooth 10" or so when converting GIFs. Values of 10 to 25 seem to work well for high-quality GIFs.   Heavy-handed dithering may require larger smoothing factors. (If you can see regular fine-scale patterns on the GIF image even without enlargement, then strong smoothing is definitely called for.)   Too large a smoothing factor will blur the output image, which you don't want.   If you are an image processing wizard, you can also do smoothing with a separate filtering program, but appropriate use of such tools is beyond the scope of this FAQ.

Quality settings around 85 (a bit higher than default) usually work well when converting color GIFs, assuming that you've picked a good smoothing factor.   You may need a higher quality setting if you can't hide the dithering pattern with a reasonable smoothing factor. Really badly dithered GIFs are best left as GIFs.

Don't expect JPEG files converted from GIFs to be as small as those created directly from full-color originals.   You won't be able to smooth away all of the dithering noise (without blurring the image) and this noise wastes space. Typically, a good-quality converted JPEG will be 1/2 to 1/3rd the size of the GIF file, not 1/4th as suggested in section 4.   If the JPEG comes out much more than half the size of the GIF, this is a good sign that the image shouldn't be converted at all.

The upshot of all this is that "cjpeg -quality 85 -smooth 10" is probably a good starting point for converting color GIFs.   But if you care about the image, you'll want to check the results and maybe try a few other settings. Blindly converting a large GIF library at this or any other setting is a recipe for disaster.

Does loss accumulate with repeated compression/decompression?

It would be nice if, having compressed an image with JPEG, you could decompress it, manipulate it (crop off a border, say), and recompress it without any further image degradation beyond what you lost initially. Unfortunately THIS IS NOT THE CASE.   In general, recompressing an altered image loses more information.   Hence it's important to minimize the number of generations of JPEG compression between initial and final versions of an image.

It turns out that if you decompress and recompress an image at the same quality setting first used, little or no further degradation occurs. (Counterintuitively, this works better the lower the quality setting. But you must use *exactly* the same setting, or all bets are off.) This means that you can make local modifications to a JPEG image without material degradation of other areas of the image.   The areas you change will degrade, though.

Unfortunately, cropping doesn't count as a local change!   JPEG processes the image in small blocks, and cropping usually moves the block boundaries, so that the image looks completely different to JPEG.   You can take advantage of the low-degradation behavior if you are careful to crop the top and left margins only by a multiple of the block size (typically 16 pixels), so that the remaining blocks start in the same places
.
The bottom line is that JPEG is a useful format for archival storage and transmission of images, but you don't want to use it as an intermediate format for sequences of image manipulation steps.   Use a lossless 24-bit format (PPM, RLE, TIFF, etc) while working on the image, then JPEG it when you are ready to file it away.   Aside from avoiding degradation, you will save a lot of compression/decompression time this way :-).

Why all the argument about file formats?

Strictly speaking, JPEG refers only to a family of compression algorithms; it does *not* refer to a specific image file format.   The JPEG committee was prevented from defining a file format by turf wars within the international standards organizations.

Since we can't actually exchange images with anyone else unless we agree on a common file format, this leaves us with a problem.   In the absence of official standards, a number of JPEG program writers have just gone off to "do their own thing", and as a result their programs aren't compatible with anybody else's.

The closest thing we have to a standard JPEG format is some work that's been coordinated by people at C-Cube Microsystems.   They have defined two JPEG-based file formats:

   * JFIF (JPEG File Interchange Format), a "low-end" format that transports pixels and not much else.

    * TIFF/JPEG, aka TIFF 6.0, an extension of the Aldus TIFF format.   TIFF is a "high-end" format that will let you record just about everything you ever wanted to know about an image, and a lot more besides :-).   TIFF is a lot more complex than JFIF, and is generally less transportable, because different vendors have often implemented slightly different and incompatible subsets of TIFF.   It's not likely that adding JPEG to the mix will do anything to improve this situation.

Both of these formats were developed with input from all the major vendors of JPEG-related products; it's reasonably likely that future commercial products will adhere to one or both standards.

JFIF has emerged as the de-facto standard on Usenet.   JFIF is simpler than TIFF and is available now; the TIFF 6.0 spec for incorporating JPEG is not widely implemented, partly because it has some serious design flaws.   It is likely that the TIFF 6.0 JPEG section will be changed significantly before widespread adoption occurs.   Even when TIFF/JPEG is well defined, the JFIF format is likely to be a widely supported "lowest common denominator"; TIFF/JPEG files may never be as transportable.

How does JPEG work?

The buzz-words to know are chrominance subsampling, discrete cosine transforms, coefficient quantization, and Huffman or arithmetic entropy coding.   This article's too long already, so I'm not going to say more than that here.   For technical information see the comp.compression FAQ, which is available from the news.answers archive at rtfm.mit.edu, in files /pub/usenet/news.answers/compression-faq/part[1-3].

The comp.compression FAQ is also a good starting point for information on other state-of-the-art image compression methods, such as wavelets and fractals.   A quick comparison: wavelets are likely to be the basis of the next generation of   image-compression standards, but they are 5 to 10 years behind JPEG in the standardization pipeline; as for fractals, it's very difficult to separate real performance from hype.

Isn't there a lossless JPEG?

There's a great deal of confusion on this subject.   The JPEG committee did define a truly lossless compression algorithm (i.e., one that guarantees the final output is bit-for-bit identical to the original input).   However, this lossless mode has almost nothing in common with the regular lossy JPEG algorithm, and it offers much less compression.

Lossless JPEG typically compresses full-color data by around 2:1.   Lossless JPEG works well only on continuous-tone images; it does not provide useful compression of palette-color images or low-bit-depth images.   (The JBIG standard is considered superior to lossless JPEG for images of less than 6 bits/sample.)

At present, very few implementations of lossless JPEG exist.   The PVRG code mentioned in section "<u>If you are looking for source code to work with</u>"   handles lossless JPEG.   Another free implementation is available from ftp.cs.cornell.edu:/pub/multimed/ljpg.tar.Z; this is a smaller program that handles *only* lossless JPEG.

Cranking a regular JPEG implementation up to its maximum quality setting *does not* get you lossless storage.   Even at the maximum possible quality setting, regular JPEG is not lossless, because it is subject to roundoff errors in various calculations.   Roundoff errors are nearly always too small to be seen, but they will accumulate if you put the image through multiple cycles of compression.

Many implementations won't even let you get to the maximum possible setting, because it's such an inefficient way to use regular JPEG.   With the IJG JPEG software, for example, you have to say not only "-quality 100" but also "-sample 1x1" to eliminate all deliberate loss of information.   The resulting files are far larger and of only fractionally better quality than files generated at more reasonable settings.   If you really need lossless storage, don't try to approximate it with regular JPEG.

Could an FPU speed up JPEG? How about a DSP chip?

Since JPEG is so compute-intensive, many people suggest that using an FPU chip (a math coprocessor) should speed it up.   This is not so. Production-quality JPEG programs use only integer arithmetic and so are unaffected by the presence or absence of floating-point hardware. Converting the key operations to floating point would only slow things down. (On some very expensive machines, where floating point arithmetic is actually faster than integer, such a rewrite would indeed be a win.   Most such hardware has "Cray" on the nameplate :-).)

On the other hand, DSP chips are ideally suited for fast repetitive integer arithmetic, so programming a DSP to do JPEG can yield significant speedups. DSPs are starting to be found as add-ons for workstations and PCs, so you can expect to see DSP-based JPEG programs popping up.

Where can I get the latest JPEG FAQ?

The full JPEG FAQ article is posted every two weeks in comp.graphics, news.answers, and related Usenet newsgroups.   You can also find the latest version in the news.answers archive at rtfm.mit.edu (18.181.0.24).   By FTP, fetch

    rtfm.mit.edu:/pub/usenet/news.answers/jpeg-faq.

If you don't have FTP, send e-mail to mail-server@rtfm.mit.edu containing the line

    send usenet/news.answers/jpeg-faq

(If you don't get a reply, the server may be misreading your return address; add a line such as "path myname@mysite" to specify your correct e-mail address to reply to.)   Many other FAQ articles are available in the news.answers archive, which is also   accessible via WAIS, WWW, and Gopher services.   For more information about the archive, retrieve the file

    rtfm.mit.edu:/pub/usenet/news.answers/news-answers/introduction.

Options/Macro Retouch

This dialog configures combo retouch operations. A combo retouch operation can perform up to 8 pre-programmed retouch functions, in sequence. The current combo retouch operation is started by a keyboard accelerator key (CONTROL+'K'). Available retouch operations are:

Retouch/Gamma Correction
Retouch/Color Balance
Retouch/Contrast Enhance
Retouch/HSV Adjust
Retouch/YCbCr Adjust
Retouch/Exp Enhance
Retouch/Log Enhance
Retouch/SineH Enhance
Retouch/Image Filters

Using one keystroke retouch operations is usefull when editing a series of similar images. If, for example, all images are too dark, low in contrast, and need color balancing, the user may define a one keystroke combo utilizing Retouch/SineH Enhance, Retouch/Contrast Enhance and Retouch/Color Balance in that order. Each operation is parametrized by values (in the same range as in the scrollbars present in their dialogs). Image filter operations are parametrized by the (0 based)displacement of the desired filter in the Retouch/Image Filters dialog.

Use the "Select retouch combo" list box to determine what retouch combo will be performed in reply to the CONTROL-'K' keyboard accelerator. The selected retouch combo is be edited by selecting up to 8 retouch operations in the "Combo retouch operations and parameters" window. Select the operations and parameters suitable for the images to be edited. Select the operation "No operation" to fill entries where no operation is desired. Clicking on the "Edit combo name" button allows for renaming the retouch combo currently selected.

LView Pro defines a few retouch combo operations. These may be altered by the user, and restored by clicking on the "Defaults" button. The predefined retouch combo operations may not produce the same effect in different video monitors/graphics cards.

Click on "Exec" to end the dialog, save all changes made to combo definitions, and start execution of the currently selected combo retouch operation.

Double clicking on a combo operation is equivalent to selecting that operation and then clicking on "Exec".

Click on "OK" to end the dialog   and save all changes made to combo definitions.

Click on "Cancel" to end the dialog and discard changes made to combo definitions.

Performance Comparisons

The SHAREWARE version of LView Pro is a 16-bit application compiled for the i386 processor. REGISTERED versions of LView Pro may be obtained for different platforms, such as for the i486/Pentium and Win32s/Windows NT. The overall performance of LView Pro is improved when switching from the SHAREWARE version to one targeted to a better processor or to Win32s/Windows NT.

For most operations, switching from the i386 version to the i486/Pentium version will not yield a significant gain in performance. On the other hand, the change from a 16-bit to a 32-bit version (Win32s/Windows NT) will   result in a 2x speed up for most operations.

The comparisons bellow were made in a 486DX66Mhz, with 20MB main memory, running Windows 3.1 and the Win32s extension. The operation utilized for performance comparison was JPEG decompression on a set of 10 fairly large JPEG files. The SHAREWARE version of LView Pro was compared with the i486/Win32s/Windows NT version of the software. Comparisons also show the effect of some previewing options configurable in the Options/Jpeg I/O dialog.

Notation:

LVPS   = LView Pro SHAREWARE (16-bit application, i386)
LVPR   = LView Pro REGISTERED (32-bit application, i486)

Times are given in minutes:seconds.

1. Loading JPEGs in 256 colors:

For this set of tests, LView Pro was tested with different decompression/quantizing/dithering setups, here is the notation and meaning for each option:

FUps = Fast Upsampling
FDCT = Fast DCT
FDith = Fast dithering
1Pass = 1 pass quantizing (when set to NO means 2 pass quantizing)

	FUps	FDCT	1Pass	FDith	Avg Time
LVPS	NO	NO	NO	NO	2:11
LVPS	YES	YES	NO	NO	1:49
LVPS	YES	YES	YES	NO	1:23
LVPS	YES	YES	YES	YES	0:59
LVPR	NO	NO	NO	NO	1:18
LVPR	YES	YES	NO	NO	1:05
LVPR	YES	YES	YES	NO	0:43
LVPR	YES	YES	YES	YES	0:29

2. Loading JPEGs in TRUE color mode (no quantizing or dithering):

The options tested were:

FUps = Fast Upsampling
FDCT = Fast DCT

	FUps	FDCT	Avg Time
LVPS	NO	NO	1:09
LVPS	YES	YES	0:47
LVPR	NO	NO	0:35
LVPR	YES	YES	0:23

3. Other JPEG previewing options

Other ways of improving JPEG decompression performance are:

LG   = Loading in grayscale
LS2   = Loading with 1/2 scaling
LS8   = Loading with 1/8 scaling

Only the results of using these options when loading JPEGs in TRUE color mode are listed, the gain in performance is similar for loading with   quantizing/dithering:

	FUps	FDCT	LG	LS2	LS8	Avg Time
LVPS	YES	YES	YES	NO	NO	0:38
LVPS	YES	YES	YES	YES	NO	0:24
LVPS	YES	YES	YES	NO	YES	0:13
LVPR	YES	YES	YES	NO	NO	0:22
LVPR	YES	YES	YES	YES	NO	0:15
LVPR	YES	YES	YES	NO	YES	0:08

Win32s, What is it?

Win32s is an extension to Windows 3.1 created by Microsoft. It may be installed on top of an existent Windows 3.1 system. For detailed information about how to obtain Win32s, please contact Microsoft.

What is the purpose of Win32s?

Among other things, Win32s allows applications that utilize 32-bit memory addressing (do not confuse that with 32-bit disk access!) to run under Windows 3.1. Win32s extends Windows 3.1 to incorporate some features found in Microsoft's 32-bit operating systems, such as Windows NT.

What is the advantage of installing Win32s, in relation with LView Pro?

Installing Win32s on your system will allow you to run LView Pro's 32-bit registered version. The greatest benefit is an overall increase in performance, due to flat (32-bit) memory addressing. See the help topic Performance Comparisons for more informations.

Installation and Troubleshooting

Correct installation of LView Pro requires moving the CTL3DV2.DLL (or CTL3D32.DLL, for 32-bit versions of LView Pro) to the Windows\system directory. Whenever it is executed, LView Pro will look for CTL3DV2.DLL (CTL3D32.DLL), in the Windows\system directory, and if the file is not present, LView Pro will terminate with an error message.

Before moving the file CTL3DV2.DLL (CTL3D32.DLL) to the Windows\system directory, please verify if a newer version of this file is already present in that directory. If so, do not overwrite it with the older version in LView Pro's package.

The above instructions apply to most Windows installations. However, there are two exceptions to the general rule, which are explained next.

1. Installing CTL3DV2.DLL (CTL3D32.DLL) in a Networked Windows environment

In that case, it may not be possible to write at the Windows\system directory. If the file CTL3DV2.DLL (CTL3D32.DLL) is not already available in the remote Windows\system directory, then you may install (move) it to the local Windows directory. You will need to inform LView Pro of that alternative location for the file. The way to do it, is to create a file named "LVIEWP.INI" in your local Windows directory, containing the following text:

[Options]
CTL3DV2=..\CTL3DV2.DLL

Or, if you are running a 32-bit version of LView Pro:

[Options]
CTL3D32=..\CTL3D32.DLL

2. Renaming CTL3DV2.DLL (CTL3D32.DLL)

Most Windows' applications will run fine with newer versions of CTL3DV2.DLL (CTL3D32.DLL). However, older applications may present problems when a new version of these DLLs is installed. It has been reported that some applications may not handle properly the version of CTL3D32.DLL that is distributed with LView Pro. In these cases, a solution is to rename CTL3DV2.DLL (CTL3D32.DLL), and notify LView Pro of the new name by changing the contents of the file LVIEWP.INI (or creating a new LVIEWP.INI file).

For instance, if file CTL3D32.DLL has to be renamed, say, to CTL3D32R.DLL,   locate the option CTL3D32= in the [Options] group, and change it to:

[Options]
··············
CTL3D32=CTL3D32R.DLL
··············

The same procedure is performed to rename CTL3DV2.DLL, if needed, by changing the CTL3DV2= option in the [Options] group.

Registration Forms

There are two types of registration forms, one for individual user registration and another for site registration, please select the one that applies:

Individual User Registration form (also available in file iregistr.txt)
Site Registration form (also available in file sregistr.txt)

```
LView Pro 1.B -- Individual User Registration Form

1. User information:

Name: _____
Address: _____
City: _____ State: _____ ZIP: _____
Country (if other than U.S.A.):_____
Phone number: (___)_____ Date (MM/DD/YY): ____/____/____
E-mail address (optional): _____

2. Choice of registered version (check one):

__ 386              Windows 3.1, 16-bit application
__ 386              Windows 3.1+Win32s/Windows NT, 32-bit application
__ 486/Pentium Windows 3.1, 16-bit application
__ 486/Pentium Windows 3.1+Win32s/Windows NT, 32-bit application

3. Shipping and Handling (check one):

__ E-mail uuencoded file to: _____
__ 3.5'' DS/HD disk

4. Payment and fees:

Fees are in U.S. dollars, please do not send cash. Checks and
money orders must be made payable to MMedia Research.
Select form of payment (check one):

__ Enclosed check or money order in U.S. dollars
__ Credit card payment: ___ VISA      ___ MasterCard
      Card Number: _____
      Expiration Date (MM/YY): ____/____
      Cardmember signature (required): _____

Check all that apply and fill in the blanks:

__ One registered copy of LView Pro 1.B or newer...........$30.00
__ U.S. Shipping and handling (if other than E-mail)........$5.00
__ Non U.S. Shipping and handling (if other than E-mail)...$12.00
__ Florida residents add appropriate sales tax.............$_____

Total:....................................................$_____

5. Mail this form together with payment to:

    MMedia Research
     Attn: Leonardo Haddad Loureiro
     1501 East Hallandale Beach Boulevard, #254
     Hallandale, FL 33009
     USA

     Or: If credit card payment was selected, this form may be faxed to
     305-458-9698 (Florida, U.S.A.) or E-mailed to mmedia@world.std.com.
```

LView Pro 1.B -- Site Registration Form

1. Site information:

Site Name: _____
Site Address:_____
City: _____ State: _____ ZIP: _____
Country (if other than US): _____
Phone number: (___)_____ Date (MM/DD/YY): ____/____/____
Authorized representative: _____
E-mail address (optional):_____

2. Choice of registered version(s) (check all that apply,
      up to the total number of copies being registered):

__ 386   Windows 3.1, 16-bit application
__ 386   Windows 3.1+Win32s/Windows NT, 32-bit application
__ 486/Pentium Windows 3.1, 16-bit application
__ 486/Pentium Windows 3.1+Win32s/Windows NT, 32-bit application

3. Shipping and Handling (check one):

__ E-mail uuencoded file to: _____
__ 3.5'' DS/HD disks (Shipping and Handling: US: $5.00 per
                                    disk *, Non U.S.: $12.00 per
disk *)

* Each version checked in item (2) requires one separate disk.

4. Payment and fees:

Fees are in U.S. dollars, please do not send cash. Checks and
money orders must be made payable to MMedia Research.
Select form of payment (check one):

__ Enclosed check or money order in U.S. dollars
__ Credit card payment: ___ VISA   ___ MasterCard
      Card Number: _____
      Expiration Date (MM/YY): ____/____
      Cardmember signature (required): _____

5. Pricing for the use of LView Pro 1.B or newer, per site
      computer (Write for pricing on quantities over 99 computers):

__   1st computer at $30: .... = $ 30.00
__   2nd to 24th computer at $20 each: ...... ____ x 20 = $_____
__ 25th to 99th computer at $17 each: ...... ____ x 17 = $_____
__ Total U.S. Shipping and handling (if not E-mail)..... $_____
__ Total Non U.S. Shipping and handling (if not E-mail). $_____
__ Florida companies add appropriate sales tax.......... $_____
Total:.. $_____

6. Mail this form together with payment to:

      MMedia Research

Attn: Leonardo Haddad Loureiro
1501 East Hallandale Beach Boulevard, #254
Hallandale, FL 33009
USA

Or: If credit card payment was selected, this form may be faxed to
305-458-9698 (Florida, U.S.A.) or E-mailed to mmedia@world.std.com.

Options/Save GIFs Interlaced

Check this menu item and LView Pro will save GIF files (both GIF87a and GIF89a) in Interlaced format. Uncheck to save non-interlaced GIFs.

Command Line Parameters

Any number of file names may be passed on the command line. Each file will be opened and displayed in a Slideshow. A file with the extension '.txt' may be passed to specify a list of filenames, one per line. Blank lines, and lines starting with the character '#' are ignored.

Registering LView Pro

Registration requires one of the <u>Registration Forms</u> to be filled out and sent to <u>MMedia Research Corp</u>. Acceptable forms of payment are checks or money orders in U.S. dollars, and credit card (VISA or MasterCard) payments. Payments must be made to MMedia Research, and mailed together with a registration form to:

    MMedia Research
    Attn: Leonardo Haddad Loureiro
    1501 East Hallandale Beach Boulevard, #254
    Hallandale, FL 33009

When credit card payment is selected, a registration form may be faxed to MMedia Research at 305-458-9698, or E-mailed to mmedia@world.std.com.

LView Pro may also be registered at CompuServe's Shareware Registration Database (GO SWREG), under ID# 4702. When registering via SWREG, please send the corresponding Registration Form to MMedia Research, either by email, fax, or mail.

MMedia Research Corp

MMedia Research is a corporation of the State of Florida, that is responsible for LView Pro distribution and licensing.   Please visit MMedia's Web page, at http://world.std.com/~mmedia, for more information about services and products offered by this corporation.   To contact MMedia Research, send an email to mmedia@world.std.com, a fax to 305-458-9698 or write to:

MMedia Research
1501 East Hallandale Beach Boulevard, #254
Hallandale, FL 33009
USA

GIF89a and Transparent Colors

LView Pro can save an image with transparent color information, using GIF89a format.

The steps are as follows:

1. Open the image file, or create a new image by pasting other images together

2. Make sure the image is palette based (not a true color image), you may use Retouch/Color Depth to reduce the number of colors.

3. Execute the dialog Options/Background Color

4. Select the palette entry that will hold the transparent color. You may use the (black and white) masks to help you decide what the palette entry is, or use the Dropper button to click on one of the pixels in the image, and select its corresponding palette entry.

5. Use File/Save As to save the image, select GIF89a as the desired format

Note1: All files saved in GIF89a format will carry transparent color information.
If you want to create a GIF WITHOUT transparent color information, use the format GIF87a.

Note2: GIF files, either in GIF87a or GIF89a format, may be created with interlaced rows. Check (uncheck) the menu item Options/Save GIFs Interlaced to turn ON (OFF) that feature.