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## Welcome:

We welcome you to the exciting world of image morphing with Morph: the first of the WinImages series of full color image processing tools for Windows.

We want you to know that Black Belt Systems is the company that made morphing affordable and available for the desktop personal computer. When we introduced morphing to the desktop, your only other alternative was a high-priced workstation with very costly software. Our morphing tools have been used for network television productions, in feature films and by many end users for their own amusement. Not only are they more powerful than the morphing tools on workstation-class machines, but they have more features and are easier to use as well!



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**WinImages:morph**  
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**Requires: 386 processor or higher, Windows 3.1, 8 Mb memory.**

**Recommended: accelerated display, FPU or 486, 12 Mb memory.**

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## WinImages:morph requires:

### **Intel Machines:**

- a Windows compatible computer
- with a 386 or higher processor
- the Windows 3.1 (or higher) operating system
- 6 Mb of RAM memory
- Win32S (Supplied on the installation disks)

Even though WinImages:morph has a relatively simple interface, the morphing operation itself is complex and resource intensive. Also, working with full color images itself is a task requiring substantial computer resources.

### ***We therefore recommend that morph be used on the following hardware:***

- an accelerated graphics display able to show 256 or more colors
- a 486 processor or better *with* a math coprocessor or activated FPU
- 8 Mb or more of RAM memory.

### **MIPS Machines**

- The Windows NT 3.1 (or higher) operating system
- 16 Mb of RAM memory
- 6 Mb of hard drive space

### **Alpha Machines**

- The Windows NT 3.1 (or higher) operating system
- 16 Mb of RAM memory
- 6 Mb of hard drive space

In general, more on board memory will always assist the running of more intensive applications like morph.

## De-installing WinImages:morph

WinImages:morph can be de-installed by following these steps:

- Start by looking through the WinImages:morph directories. Make sure that all image files that you wish to keep are copied or moved to another directory. You will have no need for files that have the following extensions: .MPR, MPT, .MTR, or .MVE. These files are only used by Morph, and can not be used with other programs.
- After moving or copying the image files that you wish to keep, delete the WinImages:morph directory and all associated subdirectories. This will remove Morph from you hard drive.
- You should also remove the Morph program and help icons from the program group that they have been placed in. If you left the icons in their original program group, you will want to delete the program group as well.

## Getting Started - The Basics

The Morph program is started by either double clicking on its icon, or by double clicking on the file MORPH.EXE from the file manager.

To perform a morph, do the following : -

**1. Load the Start and End images.** Currently , Morph reads:

- Windows Bitmap Files (BMPs or DIBs)
- Targa
- TIFF
- PCX
- Amiga IFF
- I-rar graphics
- Black Belt Systems lossless compression format TRIM
- JFIF/JPEG
- Animator FLI/FLC
- Frames from its own FiLM Strip files

A morph usually takes two images and produces one or a series of output images. WinImages:morph displays the two original images in the Start and End window.

**2. Add control points, lines, or curves to the Start Image.**

A morph changes the shape of the subject in the start frame to the shape of the subject in the end frame. To achieve this, the program requires you to identify similar features in both frames. Each point, line, or curve you add has a position in the start image and a position in the end image.

For example, a morph between two faces would require points or lines around each face, on the eyes, nose and mouth. For more detail, you could place a circle of points around the eyes and around the mouths of each subject, or you could use one of the line tools to draw around these features. You can even place points and lines on more subtle features such as dimples and tufts of hair. As a general rule, the more control you specify, the better the results.

**3. Move the control points, lines, and curves to matching features in each image by clicking and dragging them with the right mouse button, or by using the Move Object control in the tool box.**

(see [Morph Operation](#) for more detail)

**4. Choose the output resolution from the Generate menu.** A higher resolution will make a smoother result and take more time. Lower resolutions will produce a blocky result but will run more quickly. (see [Sequence Controls](#).)

**5. Select Do One Frame from the Generate menu.** Progress is shown with a **Status Bar** while a new image is created. The new image will be displayed in the Result window and in the Film Strip if it is open.

There is an example morph project supplied with the program which you can load and demonstrate. . .

To try it, run WinImages:morph,

- load the start frame: FIREGIRL.TRM
- then load the end frame: FROGORIG.TRM
- load the control points/lines: GIRLFROG.MPT

- and select one of the **Generate** options.

When an output morph image is produced, it will be displayed in the Result window. Additionally, a smaller copy of each result image can be put into the film strip. However, your best result image should be the one saved directly, not the film strip copy.

**To ensure that the result frames will get saved:**

- 1 Use the **Generate/Sequence Controls** menu option to check **Save Results**.
- 2 In the same menu set the desired **Output Size** and **Output File Name and Directory**.
- 3 Using the provided file requester in Sequence controls select the output format you require.

With these options selected each result frame will be saved as it is created. If you selected **Animator FLIC** animation (or **Video for Windows AVI**) as your output format, each frame will get added to an FLC (or AVI) file ready for Animator to display.

**So, to save into an Animator FLIC animation file:**

- 1 Choose Animator FLI/FLC (or AVI) as your output format in the **Sequence Controls** dialog .
- 2 Select the **Save Result** option in the **Sequence Controls**.
- 3 Ensure that Begin Frame = 1 and Finish frame = Total Frames in the Sequence Controls .
- 4 Set the Output File name in the Sequence Controls .
- 5 **Sequence Generate** the morph. The Animator file will be created during the morph.

**See Also:** [Supplied Examples](#)

[Morphing Tutorials](#)

## Morphing - In General

The term morph conjures up pictures in the mind of something normal-looking twisting and turning, features running like wax and through some film-makers voodoo finally turning into... something else, maybe normal looking, maybe not. WinImages: morph can do every bit of that; and do it well.

The process of creating a morph is not really very complex, either. This documentation contains all the basic information you'll need to create outstanding looking morphs. However, to get the most from this product, it is worth taking the time to examine a very short description of what we mean by morphing in a technical sense.

# Morphing - A Quick Technical Overview

**The concept of morphing has two meanings in this software;**

**(a)** Distorting a single image into a new image using positional control information supplied by the user. This is called Warp Morphing, or Warping.

**(b)** Combining distortions of two images to form a new image, using color information from both source images, along with positional control information supplied by the user. This is the classical Morph operation.

Morphing can also be taken generally to mean the generation of a sequence of images using either method (a) or (b) as just discussed, instead of just a single image. Such a sequence provides a continuous (or as nearly so as possible) change from one image to the other when these images are played back in real time as in a video or a movie. If a sequence of images is desired as morph output, then the user can supply a second control element, timing. This type of morphing is known as **Motion Morphing**.

# Controlling Morphing

**When using WinImages: morph to generate morphs, you have excellent control over the three most important factors in the process:**

## **1 - Geometry:**

Localized positional changes of the image's surface - often called Topology control. You can think of this in more general terms as physical distortion, or warping. This is key to the morphing and warping processes, because when changing an image to a totally new look, portions of the image must move. Your ability to control that movement is the key to creating highly effective and believable changes. This type of control is achieved through placing Control Points, Links, and Lines on the image, or images, to be morphed or warped.

## **2 - Velocity:**

This is the rate of change of the specific physical distortions, or warps. The ability to cause a particular distortion to occur later, earlier, slower or faster than other portions of a morph is what allows you to subtly call attention to one area of a morph over another. Velocity control is accomplished by selecting a Point, group of Points, or a Line and then "assigning" them to a Velocity Curve. These curves control the rate at which the topology of the image is changed along the path defined by the starting and ending control objects.

## **3 - Colorimetry:**

Colorimetry refers to transparency changes between two images (this does not apply to warp morphs). As the positions of features in an image change, so to must the color(s) of the regions that are moving. In every case, the colors change from those of the starting image to those of the ending image. Wide control in this facet of a morph allows you to keep the original colorations for all of or a portion of a morph as long as you feel it is required. You can also force an early change to the colors of the final frame this way. Transparency control is effected by assigning a Point, group of Points, or a Line to a Transparency Curve. A Transparency Curve affects the rate at which the colors for the area near the selected Points or Line change from the source image to the destination image. Note that an otherwise linear Transparency Curve can apply color changes in a nonlinear fashion if there is a velocity curve which also affects the same region. Velocity affects Transparency; but not the other way around.

### **Points**

Control Points are actually the ends of a Path over which you want a portion of an image to move. The portion of the image underneath the starting Point will move to the location underneath the ending point - the area of the image that it moves through is what is known as the path. Note that we do not describe this as a "vector", as you may find it described in the technical literature which describes morphing - this is because in our software, the path may not be a straight line, and so it is inaccurate to describe it as a vector.

### **Links**

Links are control elements that exist between pairs of paths; when you add a link, it will appear between the pair of points on the starting frame, and also between the pair of points in the ending frame that specify the end of those two paths. The Link will deform as required to remain a straight line between the two paths as they change over the course of a morph or a warp.

The purpose of a link is to create a "hard" boundary over part of the image; a region where the image will not "flow" through where the Link blocks it. You use Links to provide sharply defined borders in your

morphs and warps.

It is possible for the image data to literally fold over, or tear at, a Link when the Control Points which specify the image's movements create topological changes which conflict with each other. When you see a fold, or a tear, you should be able to fix it by altering or removing one or more control points in the area of the problem.

### **Lines and Curves**

Lines and Curves are control elements that are similar to points, but they cover a greater area. Lines are applied using the tools located in the tool box. These tools allow you to create control lines that range from ovals to complex freehand lines. Each line is independent from other lines, and is placed in both the start and the end image. Lines differ from points in that points must be manipulated to the correct position in one of the images after they have been placed. Lines allow you to draw around the feature in the start image and then draw around the feature in the end image. This can be particularly useful for motion morphs.

### **Layers**

Layers and layering allow you to separate various objects from the rest of the morph, and morph them independent of objects not in the same layer. For example, the Bounce motion morph project uses two layers. The first layer (also known as the Base Layer) contains no control objects, and is essentially the background of the motion morph frames. The second layer contains 1 object (the circle and square outlines), which is placed above the background. When the morph is generated, the base layer is created first, and then any subsequent layers that have been specified. In this case there is only one other layer, so it is created and placed on top of the base layer. The overall effect is the ball morphing into the square without ever altering the background information. In previous releases of the software, this functionality was not available. Users had to specify more control points and lines to keep the background from moving. Layering eliminates the need for these "holding points".

## Using Morph:

**Once Morph is started the main window will be displayed. It has a number of important areas:**

- Pull Down Menus for most control operations.
- Main Window Buttons for morph control point/line manipulation and to turn the film strip animation on and off.
- Start Frame View Window - The Start image and the control points/lines for the start position are displayed here. Image files can be loaded into the Start or the End Frame using the File Menu or by using the drag and drop method to load the files from the file manager.
- End Frame View Window - The End image and the control points/lines for the end position are displayed here.
- Result Window - This is where the last created morph frame is displayed.
- Filmstrip - Optionally, a film strip preview and animation window can be displayed.
- Tool Box - The tool box allows you to specify points, lines, and curves using eight separate drawing tools. There is also a control for moving and re-shaping lines which have already been placed.

Other control windows are opened as requested. The images loaded into the start and end frames will be shown in the appropriate view windows. The resultant morph frames will appear in the Result window, and the Film Strip if it is "on" during the generation of the morph.

### **To add control points:**

Click in either window with the left mouse button with the point tool specified in the tool box.

### **To move control points:**

Click over a control point with the right mouse button and drag the point around while holding the button down.

### **To select a control point:**

Click over the point with the right mouse button. Most points are shown with a red outlined cross. The currently selected point has an aqua outline.

### **To delete a control point:**

Once a point is selected it will be drawn in aqua. This point can be deleted just by hitting the main window button **Delete Point**, or by pressing the **Delete** key on the keyboard.

### **To add a line or curve:**

Select the desired drawing tool from the tool box, and then draw on the start image using that tool's special controls (these controls are defined in each tool's specific documentation). Once the line or curve has been placed, draw the desired line in the end image. After this is completed press the right mouse button to tell morph you are done. Morph will then draw the line using the specified color and thickness settings.

### **To switch from control object to control object:**

Use the left and right arrow key to switch from control object to control object in the view images. You can also press the **Ctrl** key and left click on the desired object to make it current. Once an object is current, it can be moved, resized, have a transparency or velocity curve assigned to it, or it can be

deleted.

**To move or adjust a line or curve:**

Select the **Move Object** option from the tool box, and move the desired control object.

## Section 6.1 Pull Down Menus

Section 6.1.1 File Menu

Section 6.1.2 Objects Menu

Section 6.1.3 Generate Menu

Section 6.1.3 Generate Menu (continued)

Section 6.1.4 Display Menu

Section 6.1.5Settings Menu

Section 6.1.6 Film Strip Menu

Section 6.1.7 View Menu

Section 6.1.8 Help Menu

## Section 6.1.1 File Menu

All control settings are saved when morph is quit. These settings will be saved in morph's **.ini** file. This file can be found in the Windows directory, and can be edited using a standard text editor (**not** a word processor).

### Open Project...

Loads a project file which then loads the Start Image, End Image and Points/Lines file for that project.

### Save Project As...

This option saves information about the current project, such as the start and end image file names, output settings, resolutions, etc. A project file is a text file and can be changed with a text editor (not a word processor).

If the control points or lines have changed, the program will save them before saving the project file. The project file contains the name of the points/lines file and the points/lines file contains any changed velocity and transparency curves.

### Close Project

This will close the current project and clear the start, end, and result images. If a filmstrip has been created or loaded it will also be cleared. All morph control points and lines are also deleted. If a current project has been set up, the program will ask whether the project should be saved. Note, that the film strip is not saved with the project, but should be saved separately if desired. If the control points or lines have changed, the program will save them before saving the project file. The project file contains the name of the points/lines file and the points/lines file contains any changed velocity and transparency curves.

### Load Start Frame/Load Start Image...

Loads an image and displays it as the Start Frame.

NOTE!! When loading any image file, the type of file is automatically identified by the program by looking into the file itself. The file extension is not significant in this identification.

The image types (file formats) that are presently loaded are as follows:

- **Windows (BMP) files:** Windows BMP (or DIB, Device Independent Bitmaps) can be from 1 bit (2 colors) through to 24 bits (16.8 million colors) and may be compressed or uncompressed.
- **Targa (TGA) files:** Targa files can have up to 16.8 million colors and may include an alpha channel (or transparency mask).
- **TIFFs:** The TIFF (Tag Image File Format) has a very broad range of possible types. The program loads all the TIFF types we have been able to find, including 1 to 24 bit RGB images, CMYK (Cyan, Magenta, Yellow, Black) color separations, Intel and Motorola formats and images directly from Macintosh computers.
- **PCX:** PCX images are typically created by Paint programs on the PC. The format was originally introduced by Zsoft for their PC Paintbrush program. We read from 1 (2 color) to 8 bit (256 color) PCX images.
- **GIF:** The GIF format, originating from Compuserve, is no longer supported by Black Belt Systems. UniSys, who owns the patent on the compression in GIF and some TIFFs, has placed new restrictions on the format that limit its use. We suggest that you use another image format like Targa or TRIM.

- **Amiga IFF/ILBM:** The program loads 24 bit IFF/ILBM images. IFF is a file format used on Amiga computers.
- **I-raw graphics:** I-raw is a simple 24 bit image format.
- **Animator FLI and FLC:** Any frame within an Animator FLI or FLC animation file can be loaded as the start or end frame. FLI/FLC sequences use up to 256 colors per pixel.
- **WinImages FiLM Strip frames:** WinImages programs save film strips as a 24 bit (16.8 million color) sequence. You may load one of the frames as your start or end frame.
- **TRIM image format:** The TRIM image format was developed here at Black Belt Systems. It is a lossless, high compression, 24-bit / full color format for continuous tone images. Typically, 24-bit images saved in this format will yield smaller file sizes than any other lossless image format we know of.
- **JFIF/JPEG:** Morph loads and saves JPEG files that are in JFIF format. JPEG is a file format which is "lossy", which means that when the image is changed into JPEG format, some of the image information is lost. For this reason, JPEG images may not be of as high a quality as you usually expect from a 24-bit file format. Note that the compression used by the JPEG process is extremely effective; so much so that images may be only 1/50th of their uncompressed size. Because of this, you may find that a JPEG file which appears to be quite small uncompresses to a very large image, which you may not be able to load into Morph without having additional RAM memory available.

The JPEG (Joint Photographic Experts Group) format images are highly compressed, 24-bit color accurate images. No mask or alpha channel information is saved; the image compression method used is "lossy". This save module provides you with the ability to set the compression used from light to heavy. More compression results in more loss of image detail.

JPEG is great for some things... and absolutely the worst thing to use for others. Consider: JPEG loses some quality when it compresses an image. Not a lot, if you use minimum compression, but still, some loss of quality occurs. If you're a scientist or a doctor, don't think "loses quality", instead think "loses and changes data"! Consider what happens if you're working on this image over a number of sessions. Each time you save and load the image in JPEG format, it deteriorates a little more (or a lot, if you compress it a great deal). The lesson, and the rule that comes from it, is obvious: Don't **ever** use JPEG as a storage format for an image you're working on, or for an image that will be used in another image (unless you positively **know** that the loss of quality won't matter, for whatever reason). JPEG is really good for archival storage of images you like, but aren't "serious" about. On minimum compression, a single use of the JPEG technique on an image will not seriously degrade it. And that's what you'd normally do with an archived image. Store it once, then load it as you please to view it, as many times as you like. If you will be doing multiple loading and saving of a particular image, you should use our TRIM format. TRIM will give you twice the compression of a standard IFF24 or TIFF with absolutely no image loss.

The JPEG file saver has an option at the bottom of the **Save Image File Requester** called **JPEG Quality**. This control allows you to specify the quality of the resulting saved image. The quality is measured on a scale from 0 (worst quality) to 100 (best quality). Increasing the quality will increase the size of the output file (less compression), and decreasing the quality will decrease the size of the output file (more compression). Remember, the lower the quality the more compression you will achieve, but this will be at the expense of losing image information.

Loading a file in WinImages:morph is very simple. First, select the Load Image... option in the File pull down menu. This will present you with a file requester which allows you to specify the file's path and

name. The file will be loaded when the file name is clicked on twice or when the file is selected and the OK button is pressed.

**NOTE!!** When loading any image file, the type of file is automatically identified by the program by looking into the file itself. The file extension is not significant in this identification.

Image files can also be loaded by using Drag and Drop from the file manager. Drag and Drop is a means of loading files into a program directly from the File Manager. In WinImages:morph image files can be dragged into the view windows.

#### **To load an image using Drag and Drop:**

1. With the WinImages:morph program opened, open the file manager
2. Make sure that both the File Manager and a View window are visible
3. Click down on the image file you want loaded
4. With the mouse button still down move the pointer to the window in morph
5. Release the mouse button over the window



When dragging files, the pointer will look like this if the file can be dropped into the underlying window, and



if it cannot be dropped there. You can also load a group of files by first selecting the files, and then using the above steps load the files into WinImages:morph.

If a file is not identified as a known image type, the message: "Image file type is not recognized." is displayed. If you encounter an image file we do not read, send it to us (we suggest you use the Black Belt Bulletin Board at (406) 367-2227) with an explanation and we will endeavor to extend the program to handle it.

#### **Load End Frame/Load End Image...**

Loads an image and displays it as the End Frame.

#### **Load Result Frame/Load Result Image...**

Loads an image and displays it in the Result window.

#### **Save Start frame as...**

The **Save Start Frame as...** control allows you to save the current start frame. The image will be saved in the format specified in the **Save File as Type** option in the Save File Requester. The file requester will present you with controls to alter the file format, color depth, compression, and output file name and path. After you have specified the desired file format, set the color depth, and compression if any is available for the current file format. The **Output Color Reduction** (Color Selection and Dithering methods) can be set before saving an image in the **Output Color Reduction** option in this menu.

#### **Current save format options include:**

**Full color Windows Bitmap**

**256 color Windows Bitmap**

**16 color Windows Bitmap**

**2 color Windows Bitmap**

**TIFF (full color)**

**\* TIFF compressed (full color)**

**Amiga IFF/ILBM (full color)**

**256 color PCX**

16 color PCX

2 color PCX

JFIF/JPEG

Animator FLIC animation

Targa 24/32 bit (full color with alpha)

Uncompressed or Compressed Targa

TRIM (full color)

256 color AVI

24-bit AVI

**\* Black Belt Systems has removed the GIF and LZW compressed TIFF image savers. UniSys who owns the patent on the compression in GIF and TIFF has placed new restrictions on the format that limit its use. We suggest that you select to save in an other compression format like Targa or TRIM.**

**NOTE!** If you load and save using an image format with less than 24 bit, full (16.8 million) color, your image quality will always be compromised.

To save to an Animator FLIC or Video for Windows AVI animation, each frame must be saved in sequence. Therefore, you must set the Save Result option in the Sequence Controls so that each frame gets saved into the animation file as it is created. This means that you will also need to specify that the file type to be saved as an FLI/FLC or AVI.

### **Save End frame as...**

The **Save End Frame as...** control allows you to save the current end frame. The image will be saved in the format specified in the **Save File as Type** option in the Save File Requester. The file requester will present you with controls to alter the file format, color depth, compression, and output file name and path. After you have specified the desired file format, set the color depth, and compression if any is available for the current file format. The **Output Color Reduction** (Color Selection and Dithering methods) can be set before saving an image in the **Output Color Reduction** option in this menu.

### **Save Result as...**

If an intermediate morph frame has been generated, this image can be saved using this option. The **Save Result as...** control allows you to save the current start frame. The image will be saved in the format specified in the **Save File as Type** option in the Save File Requester. The file requester will present you with controls to alter the file format, color depth, compression, and output file name and path. After you have specified the desired file format, set the color depth, and compression if any is available for the current file format. The **Output Color Reduction** (Color Selection and Dithering methods) can be set before saving an image in the **Output Color Reduction** option in this menu.

### **Capture Screen...**

The screen capture option allows you to set up a screen capture from within morph. The screen capture utilities can be used to capture morph's screen immediately, or it can be delayed so that you may capture the screen of another application. You also have the option of capturing into memory (an image view in morph), or capturing into an image file. Once a screen has been captured, it can be treated like any other image in morph.

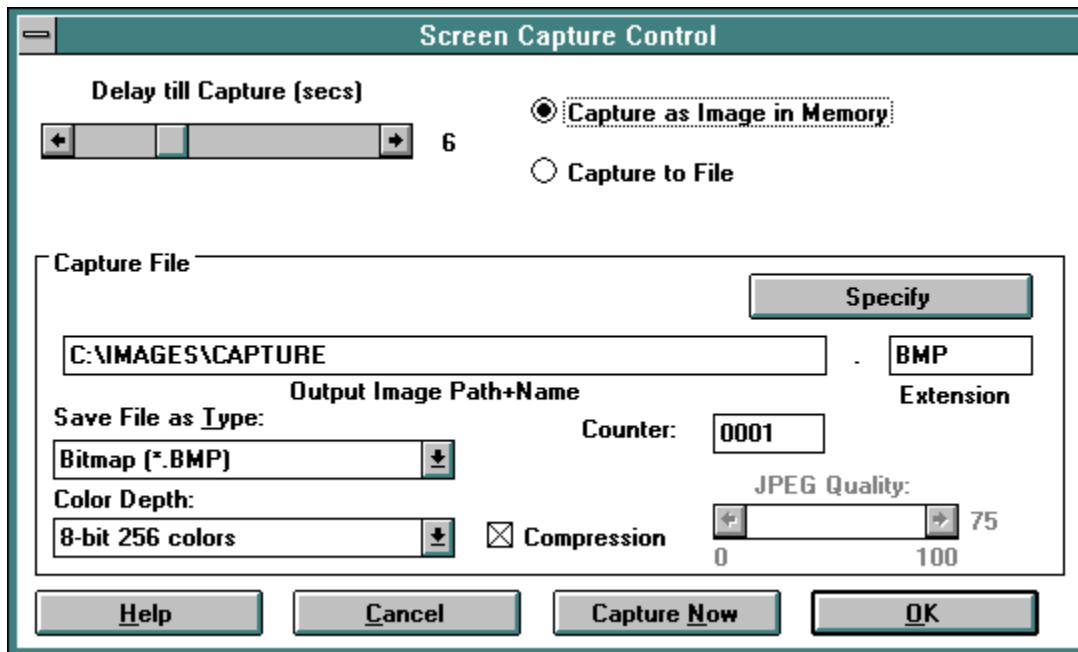
### **Step by Step Instructions for Capturing Screens:**

Enter the File menu and select Capture Screen, or press the F9 key (Quick Capture) to capture the current morph program screen using the default screen capture settings.

If you open the Screen Capture Control dialog, then specify any needed time delay, where the image is to be captured (image view or image file), and any other file related details.

Select the Capture Now option to capture morph's screen using the current screen capture settings, or to use the time delay to capture another application's screen. Pressing the Ok button will not capture the screen. This will instead confirm any changes that you made to the screen capture dialog, and save them for use with the Quick Capture keystroke (F9).

If you are capturing morph's screen, simply wait until the screen capture has completed (watch the progress bar), If you are capturing another program's screen with a time delay, use ALT+TAB switching to bring the application to be captured to the front. You will need to wait until the timer has elapsed, and the screen has been captured. You can then switch back to morph, and view the newly created capture.



#### Screen Capture Controls:

**Delay till Capture:** This control allows you to specify the delay time (in seconds) before the screen capture occurs. This allows you time to switch to another application, or to rearrange morph's screen elements. The delay can range from 0 (no delay) to 15 seconds.

**Capture to Memory/File:** These radio buttons allow you to select if the file will be captured and placed into an image view in morph, or saved to an image file. If Capture as Image in Memory is selected, then the screen capture will be placed into an image view in morph. If Capture to File is selected, then the screen capture will be saved into the specified file name and format located in the Capture File section of the dialog.

**Specify:** Pressing this button will access a standard file requester which can be use for setting the image path, image name, file type, and file type options. After you have set these parameters, press the Ok button to confirm the changes and return to the dialog. You can alter any of these parameters from within the Screen Capture dialog by changing the appropriate text entry field, or drop down box entry.

**Output Image Path+Name/Ext:** This text entry field is used to specify the image path and file name for the screen capture. This information will be used to determine where the capture will be saved on your hard drive, and the image file name. The extension is automatically determined by the file type. For

example, Targa files are saved with a .TGA extension by default. This can be changed to any extension by entering in the desired extension in the Extension box. It is important to remember that you are required to have a complete path and file name for any file that is to be saved. If you are unsure about the image path or name, you should use the Specify button to select a path and file name.

**Save File as Type:** This drop down box contains a list of all of the available save types in morph. The file type that is selected will be used as the file format for the screen capture. This save type is changed by simply double clicking on a new file type. Each new file type will have various options associated with it. These options are controlled through the Color Depth and Compression controls. For example, if your Save Type was set to Bitmap, then you would have the option to save it as 24 bit, 16 bit, 8 bit, 4 bit, or 1 bit bitmap that can be compressed or uncompressed.

**Color Depth:** This drop down box contains all of the available bit depth (number of possible colors) for a file type. Each file format in the Save File as Type drop down box has different bit depths associated with it. Some formats (like JPEG) only have one bit depth (24 bit). Other formats (like Bitmap) have multiple bit depths for saving. In most cases you will want to select a 24 bit depth for high quality screen captures.

**Compression:** The compression check box allows you to select compressed or uncompressed for an image file format. It is important to remember that not all image file formats support compression. If the file format does support compression, then the check box will be available. If no compression method is available for the current file type, then the compression check box will not be available.

**JPEG Quality:** The slider is only available for JPEG image files. This control allows you to specify the quality of the resulting saved image. The quality is measured on a scale from 0 (worst quality) to 100 (best quality). Increasing the quality will increase the size of the output file (less compression), and decreasing the quality will decrease the size of the output file (more compression). Remember, the lower the quality the more compression you will achieve, but this will be at the expense of losing image information.

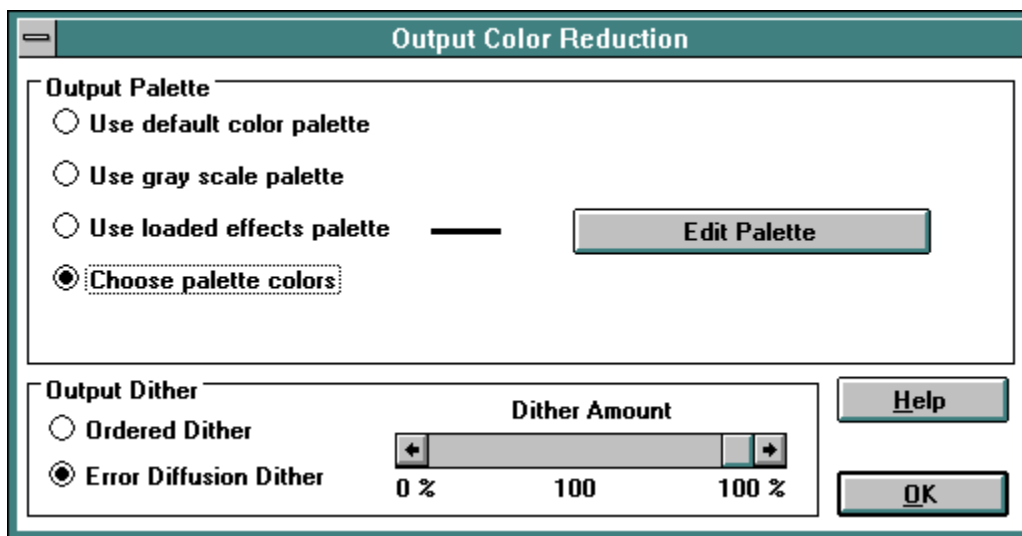
**Counter:** The counter will put an automatic four digit extension on to the current capture file name. This allows you to capture a number of sequential screens that have an identifying number. This number is automatically incremented whenever a new screen is captured. This counter can only be reset by entering a zero value.

## **Related Topics:**

[Output Color Reduction](#)

## Output Color Reduction

This allows you to specify how the color palette will be selected for any output format with less than full color. (See render methods.) This dialog contains a full range of palette and dither option that are used to specify the type of color reduction for your output needs. These color reductions can be used for single output images as well as entire sequences of animation frames. It is important to remember that color reduction is only valid for formats that are less than 24 bit color (256 or 16 color formats). There are two types of palettes in morph. There is the render palette which can be determined by color selection processes, it can be a default palette, or it can be an render palette. The render palette is the current palette in the actual render palette control dialog. This dialog can be accessed by selecting the Edit Palette option. The dialog below shows all of the Color Reduction tools. Clicking on one of the tools with the left mouse button will access help for that option.



### Output Color Reduction Controls:

**Use Default Palette:** This option, when selected, will render the image using a default set of colors. These colors are predetermined for both 16 and 256 color renders. A 16 color render will use the default Windows palette for rendering, and a 256 color render will use a preset palette designed at Black Belt Systems to produce high quality renders without any color selection. This method is the fastest render method, but also has the lowest quality.

**Use Gray Scale Palette:** The Gray Scale Palette render option will render the output in either 16 or 256 gray levels. The gray scale palettes are predetermined which makes the gray scale render very fast.

**Use Loaded Render Palette:** This option will use the range of colors which is currently loaded into the render palette. This range of colors can be specified manually or by loading a specific render palette file. The render operation will then use the colors in the effect palette as the render palette for the output files. This option is ideal for using a very specific palette for an output animation or sequence of files. Morph will only use the number of colors specified in the render palette. For example, if you were doing a 256 color Bitmap render with only 240 colors in the render palette, the rendered bitmap would only use the available 240 colors. The same is true for any number of colors. This means that it is possible to render a 256 color output with only 2 colors in the render palette. If you were to create a 16 color bitmap with 256 colors in the render palette, only the first 16 would be used.

The render palette can be altered by selecting the Edit Palette option located to the right of this control. Pressing the Edit Palette button will access the palette controls. You then have the option to load or

manipulate a palette in any manner that you like (see the [palette controls](#) for more details). Once you have the desired output palette, select the Close button. This will place you back in the main morph workspace. If you have any further color reductions to make, select the Output Color Reductions option again to make your adjustments. After you are satisfied with your selection, select the Ok button to exit the dialog. These changes will remain valid until they are changed by you. All non-24 bit files saved will use the specified color reduction method.

**Choose Palette Colors:** This option will allow morph to use its custom color selection process to select the best colors possible for the output image. The Spectral Color Selection process will determine the output colors which best represent the colors in the actual image. This format is valid for both 16 and 256 color render modes.

**Edit Palette:** The Edit Palette button will access morph's render palette. This palette can then be adjusted, altered, or a new palette can be loaded for use as the render palette. Once you have the desired palette, select the Close button to exit the palette. You can then use the Use Loaded Render Palette to generate a frame or sequence of frames which uses the current render palette as the output image palette. This is very useful for creating output files or animations that use the same exact palette for each file or frame. It is important to remember that the last set of colors in the render palette will be the one that is used for all renders that use the render palette. This palette can be changed at any time, and is saved upon exiting the render palette.

**Ordered Dither:** Ordered Dither will dither the image based on the current pixel, and that pixel's location in the actual image. This type of dithering will generally produce a lower quality image, but is necessary for animation that will be using any type of compression. The ordered dither allows for a great deal of interframe compression, which is needed to compress animation files. This type of dithering should only be used for the output of animation files. If you want to produce higher quality output images (not animations), you should use the EDD dither method. If you want to produce even higher quality render, you should use 24bit file or animation formats. Remember, the quality of the final result is directly related to the quality of the initial image.

**Error Diffusion Dither:** Error Diffusion Dither (or EDD) will dither the image based on the specific pixel colors, and the colors of neighboring pixels. This will generally produce the highest quality dithering in the image, with the best possible colors being represented by the dither. This is done at the expense of adding more "noise" to the image. This means that in some cases the dither is easier to perceive. This type of situation can be remedied by decreasing the dither amount, or by always working with 24bit files and output images. Remember, the quality of the final result is directly related to the initial image quality.

**Dither Amount:** The Dither Amount control is used to specify the percentage amount of dither in a render. This amount can range from 0 (no dither) to 100 (maximum dither). The dither amount can effect the amount of intraframe compression over the sequence. This can reduce the overall size of the animation frame. You can achieve greater interframe compression by selecting the ordered dither option instead of the EDD dither. Ordered dither, by nature, will give you more interframe compression in animation formats like AVI.

**Note:** Due to the superb color selection technology in morph, some animation that use low amounts or no dither will look nearly identical to animations using a high amounts of dither. This is especially true with the Choose Palette Colors render option. Generally a reduction in the dither amount can result in a loss in quality, but morph's color selection chooses colors that will minimize this quality loss. If you are trying to reduce the size of an animation, it is suggested that you use a dither setting of about 50%, and Ordered Dither. This will give you a large amount of interframe and intraframe compression.

**Which Color Reduction Method is Best?**

Each of the available color reduction methods and dither techniques have certain applications for which they are best suited. If you are producing single frames images that are less than 24 bit, you should use the Choose palette colors option with an EDD dither set to 90 - 100%. This will allow morph to select the best possible colors

## Section 6.1.2 Objects Menu

### Load Objects...

The shape relationship between the start and end images ( or between the start image and what it will be distorted to) is specified by control objects, such as lines and curves, placed over the images.

Points and lines can be placed on the images as described later. These points and lines with all their associated information can be saved and loaded. This option loads a set of points, links, and lines and displays them on the start and end images.

#### **Point and Lines files will also contain all associated information:**

- Velocity Curves and curve-point or curve-line associations,
- Transparency Curves and curve-point or curve-line associations.

These files are compatible with those saved from **Imagemaster** for the **Commodore Amiga** by **Black Belt Systems**.

### Save Objects...

This saves the points/lines with all associated velocity and transparency information.

### Delete Objects...

This deletes all the control objects currently placed on the start and end images.

### Shape from Corner...

This option allows you to toggle the IShape area selection from center to corner based area selections. Both methods work in the same manner, but have different anchor point (center or corner). If this option is selected, the area selection will be made using a corner anchor point. This means that the shape will "grow" from the initial mouse click which specifies the top left corner of the area selection. If this option is not selected, then the area selection will "grow" from a center anchor point. You can change this mode while specifying an object by holding down the ALT key while sizing the area. If you wish to return to the alternate mode, simply release the ALT button.

### Rectangle from Corner...

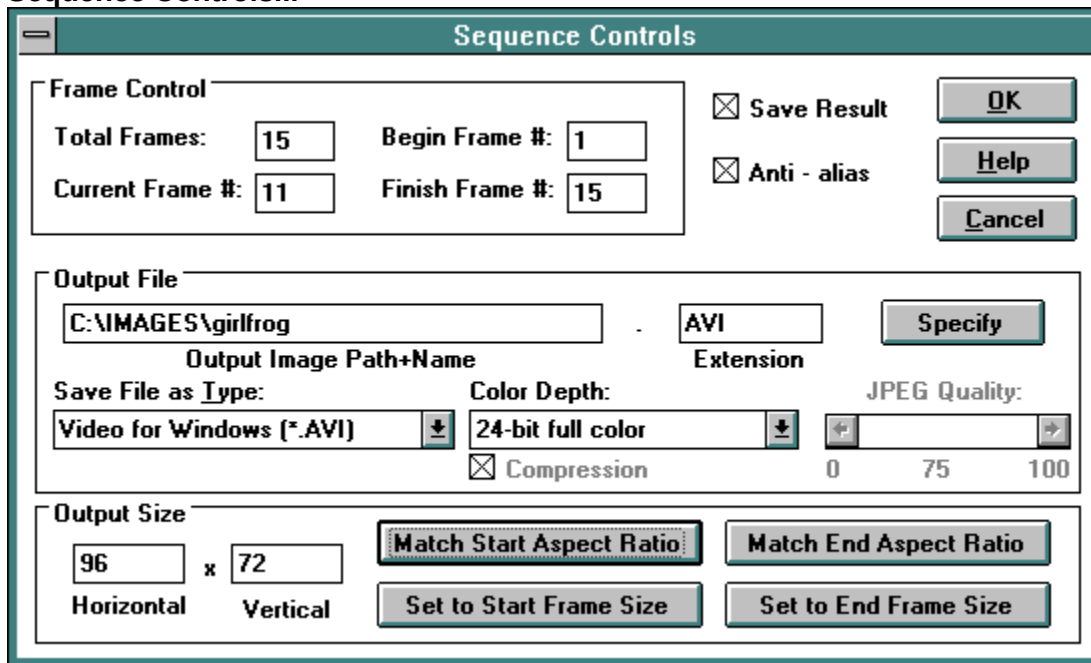
This option allows you to toggle the Rectangle area selection from center to corner based area selections. Both methods work in the same manner, but have different anchor point (center or corner). If this option is selected, the area selection will be made using a corner anchor point. This means that the shape will "grow" from the initial mouse click which specifies the top left corner of the area selection. If this option is not selected, then the area selection will "grow" from a center anchor point. You can change this mode while specifying an object by holding down the ALT key while sizing the area. If you wish to return to the alternate mode, simply release the ALT button.

### Ellipse from Corner...

This option allows you to toggle the Ellipse area selection from center to corner based area selection. Both methods work in the same manner, but have different anchor point (center or corner). If this option is selected, the area selection will be made using a corner anchor point. This means that the shape will "grow" from the initial mouse click which specifies the top left corner of the area selection. If this option is not selected, then the area selection will "grow" from a center anchor point. You can change this mode while specifying an object by holding down the ALT key while sizing the area. If you wish to return to the alternate mode, simply release the ALT button.

## Section 6.1.3 Generate Menu

### Sequence Controls...



The dialog box is titled "Sequence Controls" and contains several sections for configuring a morph sequence.

- Frame Control:** Includes input fields for "Total Frames" (15), "Begin Frame #:" (1), "Current Frame #:" (11), and "Finish Frame #:" (15).
- Save/Action Buttons:** Checkboxes for "Save Result" and "Anti - alias", and buttons for "OK", "Help", and "Cancel".
- Output File:** Includes a text field for the "Output Image Path+Name" (C:\IMAGES\girlfrog), a dropdown for "Extension" (AVI), and a "Specify" button.
- Save File as Type:** A dropdown menu showing "Video for Windows (\*.AVI)".
- Color Depth:** A dropdown menu showing "24-bit full color".
- JPEG Quality:** A slider ranging from 0 to 100, currently set at 75.
- Compression:** A checked checkbox.
- Output Size:** Includes input fields for "Horizontal" (96) and "Vertical" (72) dimensions, and buttons for "Match Start Aspect Ratio", "Match End Aspect Ratio", "Set to Start Frame Size", and "Set to End Frame Size".

This is where the user sets the working parameters for the morph. These include resolution, output format, and number of frames. The descriptions below detail all of this dialog's controls.

#### Total frames:

The total number of frames in the morph. The film strip is also this number of frames in length.

#### Begin Frame #:

This is the frame number where morphing will begin for a sequence generation.

#### Finish Frame #:

This is the frame number where morphing will finish for a sequence generation.

#### Current Frame #:

When 'Do one Frame' is selected, this is the frame that will be created. For example, if you set total frames to 15. A current frame of seven will generate the middle frame, half way between the Start and End frames. If you then set Begin Frame to 1 and Finish Frame to 15, all the frames of the morph animation will be generated.

#### Anti-Alias:

Anti-aliasing affects the spacial (or position) accuracy of the morph result in distances less than one pixel width. Have this switched on for the best quality result, or switched off for slightly faster operation.

#### Save Result:

When a morph frame is generated, this switch tells the program to automatically save the resulting image. You must have this selected to save to an Animator FLIC animation, because each frame needs to be saved as it is created. The files will be saved in the format specified in the **Save File as Type** option found in this dialog

**Output file:**

The file name that will be used when the morph result is automatically saved.

**Specify:**

This opens a file requester to locate a valid path and file name for the output file. When saving to an Animator FLIC animation this file name will be used directly. Otherwise, the last four characters of the file name (before the extension) will be replaced with the frame number (0001 to 9999).

ie.

**C:\IMAGES\ MYIMAGE.TIF** will be changed to

**C:\IMAGES\ MYIM0007.TIF** for frame seven.

This requester also contains all of the output file information. This includes format, Color Depth, Compression, and output path and file name. Morph will automatically alter the output file format if you change the extension of the image name. For example, if you changed the extension from AVI to FLC, morph would automatically alter the file type to FLC/FLI.

**Save File as Type**

This drop down box allows you to select the output file format for a sequence of morph frames. Changing the save type will also change the save options (Color Depth, Compression, and JPEG Quality) that are available. For example, if you select BMP as the output format, you would be able to select a 24 bit, 8 bit, 4 bit, or 1 bit render Color Depth for that format. It is important to remember that not all file formats will have output options such as color depth. These options will only be available for the file types which use them.

**Output size:**

This is the resolution of the morph results created. It is the main determinate of the output quality. The film strip resolution is not the same as this size; however, the filmstrip quality can never be better than the output resolution.

For example,

**320 x 200** is a low resolution VGA output,

**640 x 480** is a high resolution VGA,

**768 x 482** is about home video resolution (NTSC).

**768 x 512** is about home video resolution (PAL).

**Match Start Aspect Ratio -**

Matches the output size to the ratio of dimensions of the Start Frame.

**Match End Aspect Ratio -**

Matches the output size to the ratio of dimensions of the End Frame.

**Set to Start Frame size -**

Matches the output size to the exact dimensions of the Start Frame.

**Set to End Frame size -**

Matches the output size to the exact dimensions of the End Frame.

**Do one frame...**

This generates one 'Result' morph frame. The frame number that will be generated was set in the **Sequence Controls**. The result image will be held by the program and displayed in the result window, therefore, it will not be automatically saved. You should save the result manually if you desire using the **Save Result** option in the File menu. This selection will allow you to specify the output file format, path, and name.

### **Sequence generate...**

This generates an entire sequence of morph frames. The extent of the sequence was specified in the **Sequence Controls** and usually goes from Frame # 1 to the last frame (which equals the **Total Frames** value set in the Sequence Controls .

If the **Save Result** option was set in the Sequence Controls, then each frame will be saved as it is generated.

### **Process Alpha**

WinImages:morph will morph the alpha channel (image transparency) of images if the original images have alpha channels and if this menu item is checked. The result images will then be created with an alpha channel. Alpha channel information is available from 32-bit Targa files.

If Targa is selected as the output format, images will be saved as 32-bit if they have an alpha channel otherwise as 24-bit. Use the **Display Alpha** menu option to see the alpha channel associated with an image.

**The Generate menu is continued in the [next topic](#).**

## Section 6.1.3 Generate Menu (continued)

### Motion Morph

A motion morph involves a sequence of start frames and a sequence of end frames. Morphing is done between successive pairs of frames. Different control point/lines files are required for positions along the sequence because the subjects in successive pairs of frames have moved. (See the definition of Motion Morphing in the Glossary).

This switch tells the program that the current project is going to be a motion morph and will require the sequence of start frames, end frames, and point/lines files to be specified.

Someone new to the program should try a regular morph before tackling motion morphing which adds an extra level of complexity to the process.

### Specify Motion start frames...

This opens a window holding the list of start frames for a motion morph. A start image has to be specified for every frame of a motion morph. You construct the list by using the following options.

- **Specify File** - Adds a file to the list. You specify files by using the file requester. You can specify more than one file at a time in the file requester by dragging the pointer over a group of files or by clicking on files with the SHIFT key depressed. Systems using extended file systems (such as NTFS and HPFS): For this to work properly, avoid putting spaces in file names.
- **Remove Entry** - Deletes the current entry from the list.
- **Show Path** - Changes the display method to show full paths with the file names.

#### *An informative line will show:*

- **At** = current position;
- **Have** = the total number of frames specified so far;
- **Need** = the total number of frames required for this morph.

### Specify Motion end frames...

This opens a window holding the list of end frames for a motion morph. This window works the same as the Specify Motion start frames window.

### Specify Motion point files...

This opens a window holding the list of point files for a motion morph. Point files have to be specified for at least the first frame of a motion morph and should be specified for not too distant intervals along the sequence. This window is similar to the **Specify Motion start frames window** with the following additions:

- **Tween** - This adds a tween entry to the list.
- **Skip** - This adds a skip entry to the list.
- **Help** - Calls the online reference for help on setting up a motion morph.

A tween entry will make the program attempt to tween (or interpolate) a set of control points or lines for that frame from the closest real point/line files either side of it. For example, you might specify a point set for frame 1 and frame 3 but let the program tween the set for frame 2. The tweening algorithm has a

limitation though. **Tweened point files must have similar control points and lines in the same order.** For example, a file with three points: subjects left eye, right eye, mouth; must have the other tween partner file in the same order: left eye, right eye, mouth. The same holds true for lines and curves. This simply means that you should use the same point files for each frame, and then manipulate the existing points and lines to fit the features for a particular frame.

How do you create point sets that match in this way? You create the first point set, save it, change the current frame, and then move the points without deleting any for the matching set, and then save them.

A skip entry causes the last real point file to be used again. This would be done when two successive frames show no movement.

Once your motion morph project has been set up you should save it in a project file. All the image names and point file names get saved in the project file, but not the point files themselves. You should save them individually.

**See Also:** [Supplied Examples](#)

### **Load the Motion files for this frame...**

This will load the Start and End images and point file for the current frame that you specified for this motion morph project.

If a motion morph project file was loaded then the Motion files for the current frame will be loaded automatically. The files will also get loaded automatically when the current frame number is changed in the Sequence Controls menu option.

## Section 6.1.4 Display Menu

This is a list of display options that Morph will use for the start frame, end frame, result and film strip display. You should choose the mode that works best for your display adapter and monitor.

### **RGB 24-bit For full color 24-bit displays.**

This mode is the highest quality color representation possible. It is sometimes called photo-realistic, full color, or true color because each screen pixel exactly represents the color of images shown on it. 256 levels each of red, green, and blue are used allowing the full 16.7 million colors. It will be faster than any other display mode if you have a 24-bit display, however, it cannot be used effectively on low color displays.

### **RGB 16-bit For 65,536 color displays.**

Displays with 16-bit capability provide 32 levels of red, 64 levels of green, and 32 levels of blue; allowing 65,536 colors. The program dithers these limited color levels to approximate true 24-bit images.

### **256 Color For 256 color (Super-VGA) displays.**

Displays that use 256 colors (and displays with fewer colors) make use of a palette so that each of the 256 choices on screen become one of 256 possible red, green, blue combinations. The program selects an optimum palette and uses dithering so that the picture looks closely like the 24-bit image it represents.

### **256 Gray For 256 level monochrome displays.**

The 256 level monochrome display reaches the full range of brightness levels but without any color information.

### **16 Color For 16 color (VGA) displays.**

Although 16 color displays use a palette, the palette has to be preset for use by Windows. The program uses dither to it fullest, however a 16 color display can only achieve about 60% color accuracy. It certainly works, but we would encourage anyone who works with full color images to get a display with more color capability. There may be a compensating factor, however, if you have a very high resolution display, the number of pixels can make up for low color accuracy, similar to the way that magazine pictures get away with only four (or actually five) colors.

### **16 Gray For 16 level monochrome displays.**

This mode uses 16 levels of gray from black through to white, and dithers to achieve the look of full gray scale.

### **2 level B+W Black and White display.**

This uses just black and white with dithering to represent the gray component of images.

### **Show Placement Tools...**

This selection will open or close the Placement Tools dialog. These tools are used to specify lines and points on the start and end images. [Press Here](#) for more information on these tools. These tools can also be accessed/closed by pressing the a/A keystroke.

### **Dark background**

This is a switch which sets the main window to show either a gray or black background.

### **Size Windows...**

The Size Windows... menu option opens a settings window that allows you to precisely set the size of the display area for the three view windows and the film strip window. Each of the Start, End, Result

and Film strip windows can be sized. The exact view area of each window is shown in the Width and Height text boxes. The numbers here can be set manually to a desired size. By hitting the 'Enter' key in a Height text box the associated window (and its image) is redrawn.

The 'Match Image' buttons set the associated window sizes to exactly match the size of the image, so each pixel in the image will be displayed "one for one" on the screen. Be careful though, if the image is larger than your entire display, not all of it will be visible.

The 'Match Aspect' buttons set the associated window to display the image with the correct aspect ratio. You set the initial width of the window and the program determines the correct height for that width.

This dialog also contains controls for sizing the filmstrip control window. Selecting the Match Image control will cause the filmstrip window to be the same resolution as the last sized image. This is not the same as having the actual filmstrip the same resolution as the current action image. In this case we are only changing the size of the window, not the resolution of the contents. This can be changed through the Filmstrip menu's Filmstrip Pixel Resolution control. (Note: Using large filmstrip pixel resolution can cause memory shortages.) The filmstrip, and its controls, are always aspect correct.

The Rescale with Main window control will force all of the views to resize if the Main program window is resized. The Maintain Aspect Ratio button allows you to have all of the current views maintain their aspect ratio when resized. This control is also available in the Display pull down menu.

### **Hold Aspect**

If Hold Aspect is selected then the display windows will be forced to show images in their correct aspect ratio. When this is turned off, view windows can be sized to any dimensions.

If you size a view window with Hold Aspect selected, its height will be changed to match the width. When a new image is loaded, the appropriate window is resized automatically to match the aspect ratio of that image.

### **Hold Relative Size**

This option, when selected, will force all of the image views (start, end, and result images) to match their actual size. This allows you to work on your images in a pixel exact or pixel for pixel mode. For example, if the start image was 320x200, then the start image view would appear as 320x200 in the program. If you zoom the image, then the image views will be resized to match the relative zoom size. If the example image described above was zoomed by 50%, then the image would appear as a 160x100 image. You may wish to turn this option off when zooming into an image.

### **Set Zoom Level**

This option allows you to specify a percentage value for zooming into the image. The zoom percentage can range from a minimum of 1% to a maximum of 1100% of the original image size. A setting of 100% will result in the image being displayed in a pixel for pixel mode. This means that a 320x200 image will be displayed as 320x200 in the program. If you select a zoom ratio which is larger than the display resolution of the program, then morph will automatically size the image to an appropriate size on screen. You will then be able to use scroll bars to move through the image. Morph provides you with several standard zoom ratios, but you can always specify your own with the slide gadget. This option is only available if the **Hold Relative Size** option is selected.

### **Show Alpha in Views**

WinImages:morph will display the alpha channel (image transparency) of images in the Start window, End window and Result window if the original images have alpha channels and if this menu item is checked. The alpha will be represented as a grey scale where black means fully transparent and white means fully

opaque. Images that do not have an alpha channel will be displayed normally.

### **Set Alpha View Color...**

This option is used to specify the alpha channels color for the Show Alpha in Views option. Selecting this option will bring morph's color selection dialog to the front. You should use the provided color selection tools to select the desired alpha channel color, and then press the Done button. In the example image below, the Alpha View color has been set to a green color. If you would like to view more information on the Color Selection dialog, [Press Here](#).

### **Set Off Image Color...**

The Set Off Image Color option is used to specify the color that will appear at the image's edge in maximized or full screen mode. This color is set using the Color Selection dialog. This dialog has a wide range of tools, and preset colors which can be used as the "off image" color. If you would like to view more information on the Color Selection dialog, [Press Here](#).

### **Beep when palette changes**

This option simply turns on an informative beep sound whenever WinImages:morph changes or detects another program changing the display palette. On computers with 256 color displays, the palette is shared by programs. If another program has changed the display palette, WinImages:morph will redraw with a new palette, however some compromise in quality may occur.

## Section 6.1.5 Settings Menu

### **Set Transparency...**

This opens the Transparency Curve control window. see [Section 6.6.2](#) describing Transparency controls.

### **Transition**

This option tells morph that you are creating a transition morph. This means that the start and the end image are separate images. If this option is selected, you can use both the velocity and transparency curves for the points and lines on the images.

### **Distortion**

This option tells morph that you are creating a warp morph. Selecting this option will cause morph to automatically place the current start frame into the end frame. You can only use velocity curves for warp morphing.

### **Set Velocity...**

This opens the Velocity Curve control window. see [Section 6.6.1](#) describing Velocity controls.

### **Buttons use Text**

This option, when selected, force the velocity and transparency graph dialog to use text based buttons instead of the default icons. If this option is not selected, the buttons will appear as icons.

### **Set Line Color...**

Selecting this option will access the **Color Selection** dialog. This dialog can then be used to specify a color for non-selected lines. This can be any color that you like, but colors that are bright are suggested. For more information on the Color Selection dialog [Press Here](#).

### **Set Selected Color...**

Selecting this option will access the **Color Selection** dialog. This dialog can then be used to specify a color for selected or currently active lines. This can be any color that you like, but colors that are bright are suggested. This color should also be different from the normal line color setting. For more information on the Color Selection dialog [Press Here](#).

### **Set Handle Color...**

Selecting this option will access the **Color Selection** dialog. This dialog can then be used to specify a color for the handles used to move control objects. This can be any color that you like, but colors that are bright are suggested. This color should also be different from the normal line color setting. For more information on the Color Selection dialog [Press Here](#).

### **Set Link Color...**

Selecting this option will access the **Color Selection** dialog. This dialog can then be used to specify a color for links between control objects. This can be any color that you like, but colors that are bright are suggested. This color should also be different from the normal line color setting. For more information on the Color Selection dialog [Press Here](#).

### **Set Line Thickness...**

This dialog allows you to specify the thickness of the lines on the start and end images. This thickness can range between one and four pixels. The thickness is used for all lines on the images.

### **Show Chronograph**

Selecting this option will front F/x's operation chronograph. The chronograph will state the operation, start time, end time, and the elapsed time. The chronograph will only update these values when a new operation is performed. The chronograph can also be opened by pressing the 'c' key, and closed by pressing the 'Shift C' key stroke.

### **Keep a log file**

For some problems, such as difficulty loading a type of image, or for a detailed record of the morph operation technically inclined users may find it useful to turn on the **Keep a log file** switch from the Settings menu. After the program is closed view the file MORPHLOG.txt that will be created in the morph program directory with a text editor.

## Section 6.1.6 Film Strip Menu

The film strip is a preview and animation area for morphs. Its resolution is independent of the Morph output resolution. (see [Section 6.5 The Filmstrip](#)) There is one frame in the film strip for each output frame of the morph. If Show Filmstrip is selected each frame of the film strip will display the frames of the morph as they are generated.

### Filmstrip Resolution

This sets the resolution of each frame in the film strip. Unlike the shots taken with a camera, the film strip frames can be any rectangular shape.

You should take care not to make the film strip too large. This will slow down the program and use memory. As a rule, the memory usage for the film strip is -

$$\text{FrameWidth} \times \text{FrameHeight} \times 3 \times \text{NumberOfFrames} .$$

So a 200 x 100 film strip of 15 frames will require 900,000 bytes. A large 320 x 200 film strip of 30 frames will require almost 6 megabytes. Since this is intended as a preview area to gain an idea of the motion over the sequence of the morph, a resolution of 96 x 72 is recommended.

Users should not confuse film strip resolution with display size. The film strip window can be scaled to any size independent of the film strip resolution.

### Animation Settings

**This switches the animation methods -**

**pong**, which runs through the sequence beginning to finish to beginning, or **normal** which just runs forwards beginning to finish and then repeats, and **reverse**, which runs through the sequence from finish back to beginning.

### Load filmstrip...

Load a film strip off disk. The type of files WinImages:morph will load into the film strip are .FLM FILM strip files saved from the program and Animator (Pro) FLIC animation files.

### Save filmstrip...

Saves the currently shown film strip to disk. The Film Strip can be saved as a FiLM (Morph's Film Strip format) file, a FLI/FLC animation, or as an AVI animation. In general, it is more efficient to use the **Save Results** option in the **Sequence Controls** dialog, rather than saving the film strip in a FLI/FLC or AVI format. Load and Save film strip are also in the Film Strip menu.

### Save filmstrip as FLI/FLC...

This saves each frame of the filmstrip into an FLI or FLC animation file. If the film strip has a resolution per frame of 320 x 200, then an FLI will be created, otherwise an FLC.

### Save filmstrip as 8-bit AVI...

This saves each frame of the filmstrip into an 8-bit 256 color AVI animation. Remember that using the film strip to hold many large output frames will require a lot of memory, and that an AVI file can be created during the morphing process instead.

### Save filmstrip as 24-bit AVI...

This saves each frame of the filmstrip into a 24-bit full color AVI animation. The film strip is always held internally as 24-bit images and this option will retain all the information in the sequence, but will require more advanced hardware to play and more space to store.

### **Animation File Frame Rate...**

This opens a dialog for setting the frame rate that is saved with animation files such as FLIC animations. The playback speed for the film strip is independent of this setting.

The dialog shows the frame rate in three interdependent ways. Changing one will change the others.

**Milliseconds per frame** - This is the way the frame rate is held inside the program. This is the number of 1/1000 seconds between frames. It is 1000 times the value of microseconds per frame that .AVI files use.

**Frames per second** - A value of 10 f.p.s. would mean 100 milliseconds per frame.

**Jiffies (per frame)** - A jiffy is 1/70 th of a second. So a value of seven (7) would represent 10 frames per second.

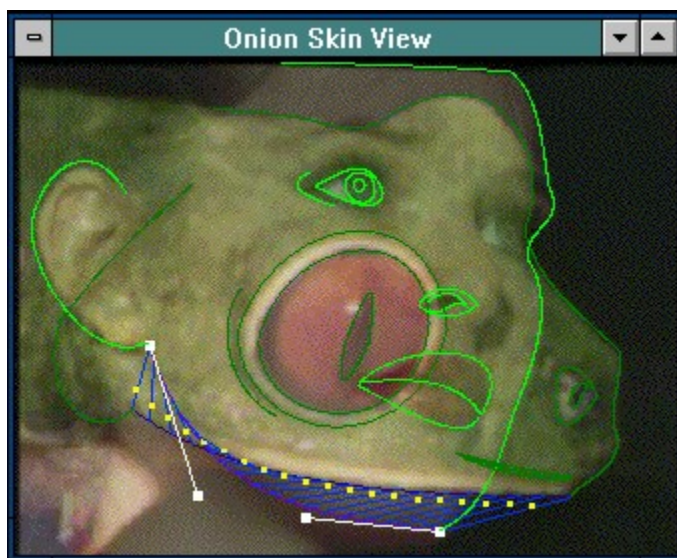
## Section 6.1.7 View Menu

### Play AVI...

This option will play any AVI animation file that was just created using the Time Line, or WinImages:morph. The AVI will automatically be opened by morph, but must be closed by the user. This option will only play AVI files. If you would like to animate any other file type in the program, you should select the play option on the filmstrip.

### Show Onion Skin View...

The Onion Skin Transparency window gives you an alternative method for examining start and end image point correlations. This special window will appear with both the start and end images superimposed over each other, with lines of correspondence running from the start image objects and the end image objects. The dialog contains many controls for altering the appearance of the onion skin transparency/images, the current frame values, and the number of points in a line or curve object. Seeing this correspondence of objects for a sequence of frames can give you a better idea of how the points and other objects will interact and move for the sequence. This window can also be used for specifying new object files. This method of object specification works in the same manner as the regular start/end image view object creation. After an object has been specified for both the start and end images, lines of correspondence will appear from the start image object to the end image object. At this point you can increase or decrease the number of points, or leave the object as they are. You can also use the onion skin window for editing existing objects and point sets by using the standard editing tool, and the provided **S** (start) and **E** (end) image toggles. Pressing the S or E buttons will cause the start or end image to be currently "on top" of the other image. By toggling between the two image views, you can do all of the standard object creation and editing as if the views were separate from one another. You will notice that the "regular" start and end image views are still visible and active. This allows you to create new objects in the regular image views, and immediately view the object correspondence in the Onion Skin window. The onion skin window can be treated like any other window in the program. This means that the window can be resized, maximized, or minimized like any other image view. Below you will find complete documentation that details each of the controls in the onion skin window, and object creation and editing using the onion skin view.



The screenshot shows the 'Onion Skin Controls' dialog box. It has a title bar with a minus sign. Inside, there are several rows of controls. The first row is 'Show Through' with a slider bar and a numeric field showing '50', followed by radio buttons for 'S' (selected) and 'E'. The second row has 'Start Cont' and 'Bright' sliders, both at '0', with radio buttons for 'S' and 'E'. The third row has 'Finish Cont' and 'Bright' sliders, both at '0', with radio buttons for 'S' and 'E'. The fourth row has 'Pt Density' with a slider at '20' and radio buttons for 'Sel' (selected), 'All', and 'Off'. The fifth row has 'Frame' with a slider at '11' and a label 'of 15'. A 'Generate' button is at the bottom right.

## The Controls:

**Show Through:** The Show Through control allows you to adjust the level of transparency between the start and end image views in the onion skin window. The default setting (50) will result in the onion skin view containing 50% of the color information from the start and end image. Adjusting the slider to the left will give you more color information from the start image (make it more opaque), and adjustments to the right of 50 will result in more of the end image showing through. This means that you can have any amount of either image showing in the onion skin view. Editing and creating control objects is handled exactly the same regardless of this setting.

**S/E:** The S and E (start and end) radio buttons allow you to switch the layering of the onion skin from start image objects on top to end image objects on top, and vice versa. This will also change which image is currently active for receiving input from the mouse. Clicking in the onion skin window with an object creation tool selected will result in a new object being specified in the currently active image (start or end). After you have completed the object creation for the start image (right mouse will stop the object specification for all object tools), alter the S/E button to the other image view and specify the corresponding object. You will see lines of correspondence between the two objects after you have completed the second object.

The same method can be used for editing an object in the onion skin window. Begin by selecting the object that you wish to edit. This can be done by using the Tab or Shift+Tab keystrokes to scroll through all of the objects, or you can press the Ctrl key and left click on the object that you want to edit. After you have finished editing the currently active image's object, switch to the other image and edit the object. You will see the lines of correspondence altering as the object is being altered. You can continue to edit other objects, or stop editing at this point.

**S/E Contrast:** The Start and End image Contrast controls allow you to alter the onion skin image's contrast for the start and end image views. This is particularly useful when the start and end images are very similar in color, and you would like to make one image more distinct than the other. Each control alters only the contrast of the start or end image (dependent on the slider that you are using). The contrast does not alter the actual images, only how they are displayed in the onion skin window. The actual images are never altered by the contrast adjustments. You should notice that after the contrast slider has been moved, the onion skin window is refreshed with the new image contrast information. Returning the contrast sliders to 0 will result in both images appearing un-contrasted in the onion skin window.

**S/E Brightness:** The Start and End image Brightness controls allow you to alter the onion skin image's brightness for the start and end image views. This is particularly useful when the start and end images are very similar in color, and you would like to make one image more distinct than the other. Each control alters only the brightness of the start or end image (dependent on the slider that you are using). The brightness does not alter the actual images, only how they are displayed in the onion skin window. The actual images are never altered by the brightness adjustments. You should notice that after the

brightness slider has been moved, the onion skin window is refreshed with the new image brightness information. Returning the brightness sliders to 0 will result in both images appearing un-brightened in the onion skin window.

**Selected/All/Off:** These controls allow you to specify which control objects will display their lines of correspondence. The first option is to show the currently selected object's correspondence lines. This will change as the current object is changed. The next option is to display all of the correspondence lines for all of the objects in the morph. It is important to remember that with a large number of objects, this selection can become confusing. The Off selection will display no correspondence lines, only the control objects themselves.

**Frame:** The Frame control allows you to show the progression of an object for a particular frame. The control ranges from 1 to the total number of frames specified in the Sequence Controls dialog. If the Frame control is set to 1, then the current object's points will appear on the start image object. As the frame value is increased, the points will move along the line of correspondence until they reach the final frame in the sequence. At that point, all of the points will appear on the end image's control object. You can select to generate any of the frames in a sequence by setting the frame value with this control, and then pressing the generate button on this dialog. This will generate the specified frame at that time. If you would like to generate a sequence of frames, select the Sequence Generate option from the Generate menu.

**Point Density:** The Point Density control allows you to specify the total number of points in a line or curve. The default setting is 20 points for an object. This means that there are twenty distinct correspondence points along the line or curve. The number of points in a line or curve can be increased or decreased through this control. Increasing the number of points in a line or curve will give that particular object more priority than a line or curve with a lower density setting. For example, a line with a point density of 100 has a higher priority than a line with a density of 20. The number of points in a line will only effect the amount of time needed to setup the morph (this is the first step). It will not effect the amount of time to generate a frame. **Note:** It is important to remember that lower point densities can lead to poorer output quality morph sequences.

**Generate:** This option will generate the current frame as set by the onion skin Frame control. This generation process will create only a single frame, and should be used primarily as a preview tool. If you would like to generate an entire sequence of frames, please use the Sequence Generate option from the Generate menu.

### **Image Information...**

This panel displays image information about the current views. This information includes the image name, pixel size, DPI, size (inches), size (millimeters), source file, image format or file type, bit depth, the parent image, and Alpha channel if it exists.

### **Change Image Information...**

This dialog allows you to alter the Name, DPI setting, Parent Image, and if the image has an alpha channel for all of the current images. These changes are only temporary, and will be lost if the image is not saved. An image can be changed as many times as you like.

## Section 6.1.8 Help Menu

WinImages:morph makes use of an online manual for help throughout the program. The relevant section of the reference can be accessed from message and error windows and from this help menu. An online manual of this form allows us to deliver up-to-date documentation on newly added features and allows you to keep your information neatly and compactly on disk. **Possibly of even greater importance in the long run, the online manual reduces our consumption of paper products for the sake of our environment.**

### **About morph...**

This displays copyright and program version information.

### **Getting Started...**

This opens the online reference to a section explaining simply how to start a morph.

### **Display quality...**

This takes the online reference to a topic describing the factors which effect the quality of the images you see on screen or export from morph.

### **Manual...**

This opens the online reference to its main contents.

### **Search for Help on...**

This option opens the help file's index system. You can then specify a topic that you would like to view more help on.

## Section 6.2 The Object Placement Tool Box



*Click on the specific Object Placement Tool for detailed help.*

The **Object Placement Tool Box** contains nine separate tools used for specifying points, control lines, and control curves in a morph. Points, lines, and curves can be referred to as control objects. Control objects allow you to specify sections of an image that should change into each other. For example, if you are morphing two faces, you would place control objects around the eyes, nose, mouth, etc. Morph offers a wide range of tools that include freehand lines, ovals, rectangles, polylines, splines, shapes, and bezier curves. Each of these tools can be used to place control lines on the start image, and then on the end image. An object placement method is selected by pressing the desired icon in the tool box. After you have done this, the selected mode will become current. This means that this mode will be used for all line or point placement until a new mode is selected.

The Left mouse is used to specify a point or the initial point of a line or curve. The left mouse button is also used for sizing ovals, rectangles, and IShapes. Each line mode has a little bit different use of the left button, so you should read each of those sections for more details. The right mouse button is used to move the entire control line or curve. The right mouse button is also used to signal morph when you are done drawing a polyline, spline, or bezier curve.

Each control object has a direction based orientation. For example, all ellipses are drawn clockwise from vertical. This means that the orientation of the object is clockwise from vertical. This is very important especially when you change from tool to tool. Let's say that you have drawn an oval in the start image, and would like to draw a freehand control line in the end image. The oval's orientation is always clockwise from vertical. This means that the line would need to be drawn from the top of the feature clockwise around it. If you were to draw the counter-clockwise from vertical the feature would become inverted over the sequence. You must always keep this in mind when specifying any lines. If you start to outline an eye in the start image from the top going counter-clockwise, then you must outline the eye or feature in the end image in the same manner - from the top going counter-clockwise.

Another important issue is the amount of lines to use for a particular morph. In most cases you will produce a better quality morph if you specify a series of short, specific lines, instead of one long line. This is due to the fact that long lines are less specific, and therefore tend to shift the position of the image data more than short lines. For example, let's say you are morphing a profiles, and would like to create a "Pinocchio Nose" effect over the sequence of frames. If you were to use one long line to specify the outline of the nose and face, you would see that the sequence would shift some image data from the

forehead and lips into the area that should be the nose. This can be avoided by specifying shorter lines that outline each feature independent of the other lines. For this example you would specify a line for the forehead, the nose, the lips, and the chin. Remember, there is no limit to the number of lines that you can use. So, use lines, curves, points, and links where ever you need them in your morphing sequence.

### **Related Topics:**

[Section 6.2.1 The Point Tool](#)

[Section 6.2.2 The Freehand Tool](#)

[Section 6.2.3 The Oval Tool](#)

[Section 6.2.4 The Rectangle Tool](#)

[Section 6.2.5 The Polyline Tool](#)

[Section 6.2.6 The Ishape Tool](#)

[Section 6.2.7 The Spline Tool](#)

[Section 6.2.8 The Bezier Curve Tool](#)

[Section 6.2.9 The Move Object Tool](#)

[Section 6.2.10 Load I-shape](#)

[Section 6.2.11 Save to I-shape](#)

## Section 6.2.1 The Point Tool

### The Point Tool:

The Point tool allows you to specify single control points on the start or end image. Placing a point in one of the images (start or end) will automatically place the same point in the other image. The point will be placed in the exact same position in the other image. All points are specified by a single left mouse click. Once a point has been specified, you can "grab" or move the point by clicking on it with the right mouse button. Once the point is in the desired location, release the right mouse button. You can switch from point to point (object to object) by pressing the left and right arrow keys on the keyboard. Doing this will scroll you through each of the available point and line objects in the start and end images.

Points and lines can be deleted by selecting the Delete button from the tool bar, or by pressing the **Delete** on the keyboard. Once a point or line is deleted, it can not be retrieved. In some cases the arrow keys may appear to not be working. This is because the input focus for the program has shifted from the image views to the filmstrip. If this occurs, simply click anywhere in the background to return the arrow controls to the image views.

## Section 6.2.2 The Freehand Tool

### The Freehand Tool:

The freehand tool allows you to draw a free form area as a control line. The line is specified by holding down the left mouse button and drawing the desired region on the start or end image. After the freehand area is set to the desired shape, release the left mouse button. Morph will then wait for you to make a freehand control line in the other image. Once this has been completed, the specified lines will be drawn using the specified color and thickness values. The area can be repositioned by pressing both the left and right mouse buttons while drawing. After the freehand line is in the correct position you may continue drawing by releasing the right mouse button or finish drawing the line by releasing both buttons. Freehand lines can be placed in the exact same position in the other image by pressing the **Enter** key. This will simply drop the line into the other image using the same size and position information.

## Section 6.2.3 The Oval Tool

**The Oval Tool:** 

The oval tool allows you to draw an elliptical shape as a control line in the start or end image. The oval is sized using the left mouse button, and its position is manipulated by using both mouse buttons at the same time. Once the mouse buttons are released, morph will wait for you to make an elliptical line specification in the other image. Once both ovals have been placed in the images, morph will draw the lines using the specified color and thickness settings. An oval can be directly placed into the other image by pressing the **Enter** key. This will simply drop the elliptical line into the other image using the same size and position information.

## Section 6.2.4 The Rectangle Tool

### The Rectangle Tool:

The rectangle tool allows you to select rectangular control lines. The rectangle is sized by pressing the left mouse button, and is moved by pressing both the left and right mouse buttons. Once the mouse buttons are released, morph will wait for a rectangle to be placed in the other image using the same method. After both rectangles have been placed, morph will draw the rectangle lines using the specified color and thickness settings. Rectangular lines can be placed in the exact same position in the other image by pressing the **Enter** key. This will simply drop the line into the other image using the same size and position information.

## Section 6.2.5 The Polyline Tool

### The Polyline Tool:

The polyline tool allows you to create lines between specified points. The left mouse button is used to specify all of the points except the final one. The polyline is completed by simply pressing the right mouse button after the final point has been specified. This will signal morph that you have finished drawing in the first image. You also have the option to simply begin drawing in the other image once the first polyline is complete. After the lines have been placed in both images, press the right mouse button to finish drawing the lines. You may move the polyline at any time prior to completing it by pressing both the left and right mouse buttons at the same time. Once you have repositioned the polyline, you may continue drawing sides or complete the shape. After you have specified the first line, you can specify the second line in the other image. Morph will automatically draw the lines using the specified color and thickness information when the second line is completed. Polyline lines can be placed in the exact same position in the other image by pressing the **Enter** key. This will simply drop the line into the other image using the same size and position information.

## Section 6.2.6 The Ishape Tool

**The IShape Tool:** 

IShapes are custom lines ranging from the outline of North America to the skyline of London. The IShape Tool works like this:

- (1) Select the IShape to be used by clicking on the Load IShape icon in the Tool Box.
- (2) Select the IShape tool.
- (3) Use the left mouse button to size the shape and both left and right mouse buttons to move the shapes position on the start or end image.
- (4) When the IShape is the proper size and in the proper position, release both mouse button and the outline will be drawn. You can then repeat this process for the other image (start or end), or you can press the **Enter** key to drop the current IShape in the other image using the same size and position information. Once both the start and end image IShapes have been placed, Morph will fill in the lines using the specified thickness and color.

WinImages:morph also gives you the ability to create your own custom IShapes. The procedure is extremely simple. First, outline the area that you wish to be an IShape using one of the area selection tools (preferably polyline or freehand). For example, if you wanted to create an IShape of a face, you would use the polyline tool to trace the around the face. After you have completed the shape, press the **Save IShape** icon in the Tool Box. After the Save IShape icon has been selected, you can then specify a name for your IShape, and where it is to be stored. You can then call your new IShape at any time by selecting the Load IShape icon, and specifying the proper name and path for the IShape.

IShapes can not be created from a point, a group of points, or links. IShapes can only be created using one of the provided line or curve drawing tools.

**See Also:** [Load IShape](#)

[Save IShape](#)

## Section 6.2.7 The Spline Tool

**The Spline Tool:** 

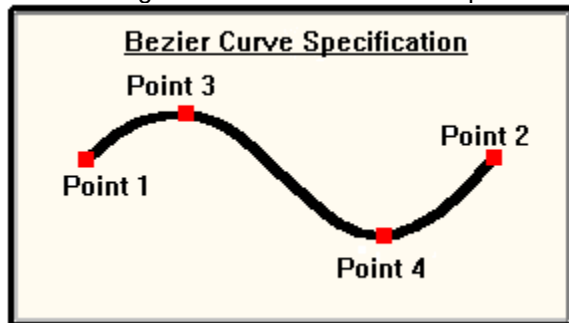
The Spline tool allows you to place curved lines on the start and end images. These curves are determined using a best fit curve between points. Points are specified using the left mouse button. If you press and hold the left mouse button, you will be able to visibly alter the curvature between the existing points. This curve can be altered on point at a time around to desired object. When specifying a point, it is important to remember that the desired curvature of the line is set at the same time. This means that you should click and hold the left mouse button down for each point. Then move the mouse until you find the desired line curvature. After the line is the proper length and curvature, release the left mouse button, and apply the next point. If this is the last point in the curve, right click after it has been positioned. This will signal morph that you have completed this curve, and will begin a new curve in the alternate view window. **(Note:** starting a new curve in the same window will eliminate the old curve.) After you have completed the second spline curve, press the right mouse button to complete the drawing. Morph will replace the outlines with the specified line color and thickness.

## Section 6.2.8 The Bezier Curve Tool

### The Bezier Curve Tool:

The Bezier Curves Tool allows you to place bezier based control curves on the start and end image. A Bezier curve is a tangential based spline curve. This means that the curve from point one to point three (see diagram below) is based on a tangent to the original line. Bezier curves have four separate control points. The initial position, the end position, and two middle curvature points. These two middle points determine the curvature between the initial and terminating points of the curve. Below is a step by step guide to using the bezier tool.

- 1 Select the Bezier Curve tool from the Tool Box.
- 2 Move the cursor into one of the available views (Start or End).
- 3 Press the left mouse button to place one end of the curve, and then drag the cursor. A line will stretch from the first point to the mouse position. When the line is the length you want, click the left the mouse button.
- 4 Drag the cursor away from the specified line. You should notice that a curve will appear. When the curve is the desired shape, press the left mouse button to place the third control point.
- 5 Now, move the cursor until the curve has the desired shape. When the curve is in the desired position and shape. place the final control point with the left mouse button. If you continue to draw with this tool on the current image, the curve will be continued from the second point specified. The diagram below shows an example bezier curve:



It is important to remember that the right mouse button can be used in conjunction with the left mouse button to move the entire curve. Pressing the right mouse button without the left pressed will signal morph that you are finished drawing the curve. You can then place the desired curve in the other image, or you can drop the curve into the other image by pressing the **Enter** key. If you continue to draw in an image view after the right mouse button has been pressed, you will be creating a new curve. The previous curve will be eliminated.

This area selection mode can be edited by selecting the Edit area selection icon from the area tool box. Once you are in edit mode, no new points may be added to the Bezier curve. You may only adjust the existing points position and the lines' curvature settings. If you drag a point you will simply be moving the points position which can effect the overall curvature of the line. If you would like to alter only that points curvature, press the CTRL key after right clicking on the desired point. This will allow you to alter the curvature of that point without eliminating the overall curvature of the entire line. If you would like to increase or decrease the curvature of an entire group of points, press the Shift key while editing the

points. By doing this, you will be editing the whole curve while maintaining the overall curvature of the line. You also have the option of moving the curve while leaving the current points curvature angle. This means that only the angle at the initial point will remain the same, and the curvature of the rest of the line will be altered. The keystroke for this type of Bezier editing is CTRL and Shift after you have right clicked on the desired point.

## Section 6.2.9 The Move Object Tool

**Move Object:** 

The Move Object option allows you to resize or alter the position of a control point, line, or curve. Selecting the **Move Object** button from the Tool Box will place morph into the move object mode. In this mode all control objects can be moved using the left and right mouse buttons. The Move Object tool is primarily used for resizing and editing an existing control object. All objects, except points, will have **handles** associated with them in this mode. A handle allows you to move and manipulate that section or portion of the line or curve. They can also control the curvature for spline and bezier curves. The left mouse button will always change the position of the current object handle. The right mouse button can be pressed over any of the handles to move the entire object. Releasing the right mouse button will drop the object. The arrow keys can be used to switch from object to object. As each control object is encountered morph will provide the appropriate handles for the object. When you have finished moving the desired objects, select any of the other tools to exit the move mode.

Pressing the **Enter** key with a freehand line selected will cause that line to change into a spline curve.

In some cases a spline based curve is easier to manipulate than a freehand line. Once a line is converted it can not be changed back.

## Section 6.2.10 Load I-shape

**Load an IShape:** 

The **Load an IShape** tool allows you to select an IShape to be used with the IShape line placement mode. The IShapes range from stars to the outline of Australia. You may also load your own custom IShape creations. The IShape that you load will remain current even if you change object placement modes.

**See Also:** [IShape Tool](#)

[Save an IShape](#)

## Section 6.2.11 Save to I-shape

**Save an IShape:** 

The **Save an IShape** function allows you to save altered or custom IShapes. After creating the IShape you can save it using this function. You can also create IShapes using one of the line specification modes. It is important to remember that this option will save the last line that was drawn. For example, if you were drawing the outline around a face on the start image, and then on the end image, the end image's line would be saved by this option. This process is described in greater detail in the section on the IShape line specification tool.

**See Also:** [IShape Tool](#)

[Load an IShape](#)

## Section 6.3 Main Window Buttons

### Delete Point



Will remove the currently selected point (and any links connected to it) or line .

### Create Link



If you click on this button it will stay selected until you click on it again. With this button down clicking with the left mouse button on two points will connect them with a link. Clicking on two points that are already connected with a link will remove the link. To prevent connecting a point with the last selected point click on the selected point again and it will become de-selected. Links are not available between lines and other control objects.

### Point Curve



Sets the velocity or transparency curve assignment for the currently selected point or line. It is important to remember that this is the only way to specify a transparency or velocity curve for a control line. You can not specify separate transparency or velocity information for the same line. For example, you can not specify the top half of a line as an **early** transparency curve, and the bottom half as a **late** transparency curve. The entire line must be either the late or the early transparency setting.

### Group Curve



After clicking this button, the program will ask for either Velocity or Transparency to be set. Draw a rectangle on either the start or end images. The program will then present a list of velocity or transparency curves. All points that lie within the rectangle you drew will be assigned to the selected curve. All points which are assigned to this curve will be redrawn with a red outline. Note: You can not use this option to specify a transparency or velocity curve for a control line or curve. Velocity and transparency information can be set for lines and curves through the **Point Curve** option.

### Bound Curve



After clicking this button, the program will ask for either Velocity or Transparency to be set. Draw an arbitrary shape on either the start or end images. The program will then present a list of velocity or transparency curves. All points that lie within the shape you drew will be assigned to the selected curve. All points which are assigned to this curve will be redrawn with a red outline. Note: You can not use this option to specify a transparency or velocity curve for a control line or curve. Velocity and transparency information can be set for lines and curves through the **Point Curve** option.

### Set Layer



The Layer button in the tool bar allows you to specify control objects into layers of control. You may be wondering what a layer even is, and how it can benefit your morph sequence. Layers and layering allow you to separate various objects from the rest of the morph, and morph them independent of objects not in the same layer. For example, the Bounce motion morph project uses two layers. The first layer (also known as the Base Layer) contains no control objects, and is essentially the background of the motion morph frames. The second layer contains 1 object (the circle and square outlines), which is place above

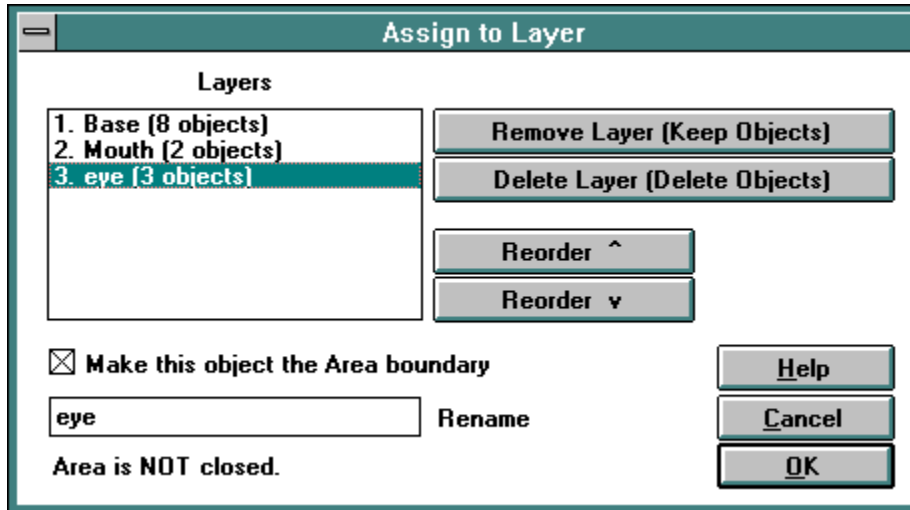
the background. When the morph is generated, the base layer is created first, and then any subsequent layers that have been specified. In this case there is only one other layer, so it is created and placed on top of the base layer. The overall effect is the ball morphing into the square without ever altering the background information. In previous releases of the software, this functionality was not available. Users had to specify more control points and lines to keep the background from moving. Layering eliminates the need for these "holding points".

Each layer that is specified can contain any number of control objects, and is morphed independent of all other layers. Each layer can contain any number of transparency and velocity information as well. It is very important to remember that each specified layer must be a closed region, or have a surrounding boundary area. For example, an eye may have several components that are within an outline of the outer eye. The outer eye object should be closed (with a link) and then the other objects inside the boundary should be added. If you specify layers that are not closed (in most cases with a link), then the morph will not be able to generate. In general, creating a layer is very simple:

1. Start by selecting an object to be placed in the layer. In general you will want to select areas of an image that contain similar information (i.e. the eyes, the mouth, nose, etc.). Objects can be selected by pressing the CTRL key while left clicking on the desired object. You will probably want to start with the boundary object for a layer, and then specify all objects within the boundary.
2. After the object has been selected, press the Layers icon in the Tool Bar. This will bring up the Assign to Layer dialog. This dialog contains a wide range of tools for specifying and modifying morphing layers. You will notice that the first time you enter the dialog that there is only one layer available in the layers list (base). To place an object in a layer other than the base, select the Add New Layer button. The current object will be automatically placed into this layer. If you wanted to place an object in an existing layer, you would simply select the object and the layer that you wanted to associate the object with in the list of layers. If you like, you can rename the currently selected layer with a suitable name (i.e. eyes, mouth, etc.). You can alter the priority or level of the layer by selecting the up or down reorder buttons. Moving the layer "up" will move it closer to the base layer (lower level), and moving the layer "down" will move the layer further away from the layer (increase level). You also have the option of deleting the current layer and its objects, or simply deleting the layer while leaving the objects intact.
3. This same process can be followed for each layer in the morph until you have specified all of the desired layers. If an area is specified as an area boundary, that object must be closed. This is something to keep in mind as you create control objects for a morph. After you have completed the layering, you will want to save your work as a project file in the File menu.

It is important to remember that the morph can not be generated if area boundary layers are not closed. This can be checked by selecting the area boundary object by pressing the Ctrl key and then left clicking on it. After you have done this, press the Layers button to access the layers dialog. If this object has already been placed into a layer, that layer will appear highlighted. At the bottom of the display you should see a small readout that says: **Area is Closed** or **Area is NOT Closed**. If all of the boundary areas are closed, then the morph will generate without any further alteration. If the current object is a boundary (Area Boundaries will have the area boundary setting checked in the layers dialog) and it is not closed, the morph will not be able to generate. Once you have determined that an area boundary is not closed., you can proceed to close it. This is done by selecting the point tool in the object tool box, and then pressing the Links button in the Icon Bar. Links are the only method of closing unbounded shapes like curves and lines. The linker can be used to close the area boundary by selecting the desired object (Ctrl left click on the object), and then clicking on it a second time to place the link. If the ends of the line or curve are close together the two ends will be linked automatically. If the ends of the object are further

apart, the edge will connect the end off the line closest to the initial click with the object closest to the final click. After you have closed the area boundary with a link, turn off the linking mode by left clicking on the link icon. Enter the Layers dialog with the area boundary selected. The readout should now state that the region is closed. If it does not review where the links were placed, and try again to close the area boundary. You will not be able to generate the morph until this boundary is closed.



### Controls:

**Layers:** This portion of the dialog contains a list of all of the layers, and how many objects are in that layer. The example layers dialog contains three layers (Base, Mouth, and eye) each with a number of objects in the layer. You should notice that the "eye" layer is selected, and at the bottom of the dialog it states **Area NOT closed**. This morph sequence would be unable to generate because the layer is not closed. Layers are formed of boundary objects (must be closed) and objects inside the boundary object (do not have to be closed).

This portion of the dialog also displays the priority or depth of each of the layers. The further down the list a layer gets, the higher it gets. For example, in the morph example above the Base layer would be morphed first, then the Mouth layer, and finally the Eye layer.

**Add New Layer:** This option will place a new layer in the list of possible layers for the morph. Once created, the new layer can be named and have control objects placed into it. It is very important to remember that new layers must have an area boundary, and this boundary must be closed. If these conditions are not met, the morph will not generate properly. Review the previous two paragraphs for more information on area boundaries and closing them.

**Remove Layer (Keep Objects):** This option will delete the currently selected layer (and all related information), but it will leave the objects in the view windows. This allows you to eliminate layer associations without eliminating specified objects.

**Delete Layer (Delete Objects):** This option will delete the currently selected layer, and all of the objects within that layer. Once this button has been pressed, all of the objects in that layer will be deleted from the image views.

**Reorder ^:** This will move the currently selected layer up one position. It will move the layer that is above it into its initial position. This is true for all layers except the Base layer which can not be moved.

**Reorder v:** This will move the currently selected layer down one position. It will move the layer that was

below it into its initial position. This is true for all layers except the Base layer which can not be moved.

**Make area boundary:** This option, when selected, will make the currently selected object into an area boundary for a layer. This means that this object must be closed, and all other objects in the layer must be found within its boundaries. If this is not the case, the morph will not generate properly. If this option is not selected, then the object will be treated like any other object in a layer.

**Rename:** This option allows you to alter the name of the currently selected layer. This can be useful for defining particular regions in an image all within the same layer heading. You may alter the name of every layer except the Base layer.

**Area Status:** This status line tells you whether the currently selected layer is closed or not. Remember, layers that are not closed will cause the program to halt creation of a single image or sequence. Layers (or layer boundaries) can be closed with a link.

**Animate** 

This displays the film strip if it is not already displayed and starts it animating. Clicking on the button again will stop the animation.

**Zoom/Negative Zoom** 

The Zoom/Negative Zoom button is broken into two sections. The top right section of the icon allows you to access the zoom tool, and the bottom left side of the icon allows you to access the negative zoom tool. After pressing the Zoom button, morph will alter the cursor to look like a magnifying glass. You can then draw a rectangle on either the Start, End, or Result images. The area inside the rectangle will be zoomed to fill the entire window. If you simply click in the view window, morph will do a 2X zoom with the center of the zoom being where you initially clicked.

**To draw a rectangle for this, or any other function:**

- 1 Click in a view window - holding down the left mouse button;
- 2 Drag the corner of the rectangle while holding down the left mouse button;
- 3 Also pressing down the right mouse button will let you move the entire rectangle;
- 4 Release the left mouse when you are happy with the rectangle position.

Pressing the Negative Zoom button allows you to select a view to be de-zoomed. If you only have one view zoomed, morph will automatically de-zoom the view. Selecting negative zoom on an unzoomed image will result in the image being zoomed out -2x. This means that the image will appear within a solid color background smaller than full size.

## Section 6.4 View Windows

**There are three view windows which are open at all times:**

**Start** - which shows the start frame

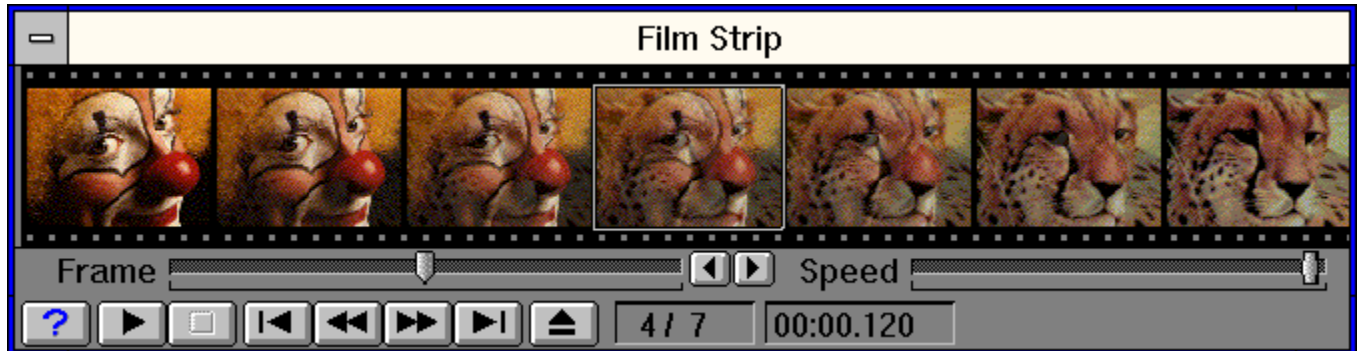
**End** - which shows the end frame

**Result** - which shows the last frame created by morphing











Onion Skin - Displays the start and end frame "on top" of each other. This display has a special control panel that allows you to alter the amount of transparency between the two images, number of points in an object, and other related settings. (For more information select the hypertext link (Onion Skin) to jump to the specific Onion Skin documentation.)

These windows display the images at a resolution that exactly fits in their display area. You can re-size each window manually, or use the **Size Windows...** menu option to set them more precisely. Using **Size Windows...** you can set the view windows to match the aspect ratio, or exact size of the images.


## Section 6.5 Film Strip



The film strip can be turned on or off. It keeps a smaller sized copy of each frame as it is created by the morph. It can also animate this sequence of frames by showing each frame in rapid succession. The film strip controls will be familiar to users of other Windows video products; they imitate your VCR.

-  **Help** - Access the online reference help on filmstrip controls.
-  **Play** - Play the film strip as an animation.
-  **Stop** - Stop the animation.
-  **Beginning** - Rewind to the first frame.
-  **Rewind** - Rewind 8 frames.
-  **Forward** - Move forward 8 frames.
-  **Seek to End** - Move to the last frame.
-  **Eject** - Eject the film strip contents. An Eject Confirmation is asked prior to ejecting the filmstrip.
-  **Left One Frame** - Rewind just 1 frame.
-  **Right One Frame** - Forward just 1 frame.

**Frame**  **Frame Position** - Manually adjust frame position.

**Speed**  **Animation Speed** - Control animation playback speed. This does not alter the animation's actual frame rate, but instead alters the playback speed of the filmstrip.

**There are also readouts for the current position.**

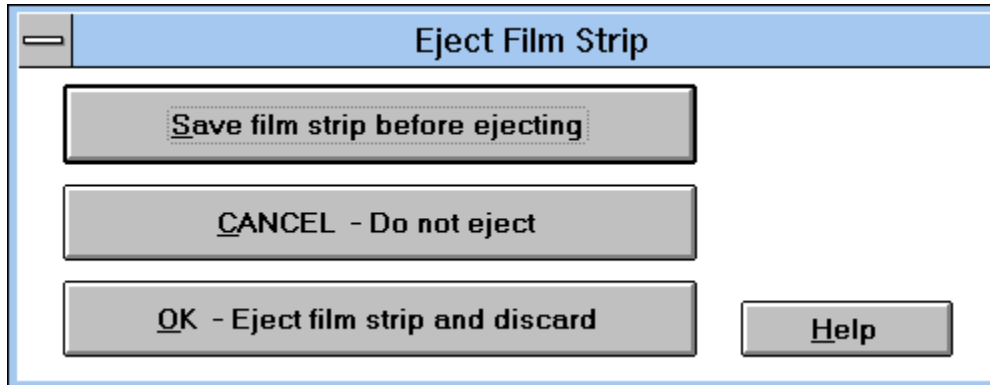
  **Film Frame + Film Time**

The first readout shows the current position as a frame number (3 in this case) and the total number of frames in the film strip (7). The second shows the time from the start of this animation in minutes : seconds . and milliseconds.

Film strip files can be stored on disk and shared and displayed on different computers. Other controls for the film strip window are in the Filmstrip Menu Options.

Animation speed depends on the film strip window size, the type of computer and the type of display adapter used. If you have an unaccelerated display device, animation cannot run very fast. On an XGA or 8514/A type accelerated display and 486, a 100 pixel by 100 pixel film strip animation should be able to run at about 40 frames per second. Animating film strips with frame resolutions greater than 320 x 200 require massive amounts of computer power. We therefore suggest that film strip sizes be kept reasonably small.

## Section 6.5 Film Strip : (continued) Eject Film



This dialog will be displayed when the film strip **Eject** button is pressed. It allows you to confirm your action before discarding the film strip contents. If you hit **OK** the film strip contents will be lost unless they have been previously saved. Pressing **Save** will present file requester for saving film strip. Then if the film strip is saved, it will be removed from the film strip window. Pressing **Cancel** in the file requester will also cancel the eject. Pressing **Cancel** will return to the program without ejecting the film strip contents.

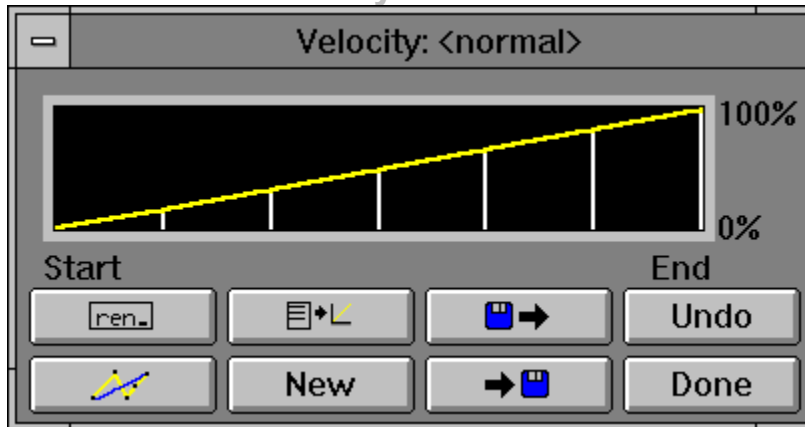
## Section 6.6 Other Control Windows

Section 6.6.1 Velocity Curve Window

Section 6.6.2 Transparency Curve Window

Section 6.6.3 Sequence Controls

## Section 6.6.1 Velocity Curve Window





Velocity curves control the rate at which the start image distorts towards the end positions. Any point or line can be associated with any velocity curve.

There can be any number of curves in a morph at one time. The first curve is named <normal>. Control points/lines can be associated with a Velocity curve making the area around the point move during the morph as specified by the curve. The <normal> curve is associated with all points and lines by default. Each curve can be adjusted by clicking and dragging it with the pointer. Curves can be independently loaded and saved to disk.


**The buttons on the window are as follows:**


**Rename:**  Changes the name for the currently viewed curve.

**Smooth:**  Smooths changes made the curve.

**Choose:**  Selects a different curve to view and change.

**New:** Creates a new velocity curve. The default shape for the curve is smooth like <normal>.

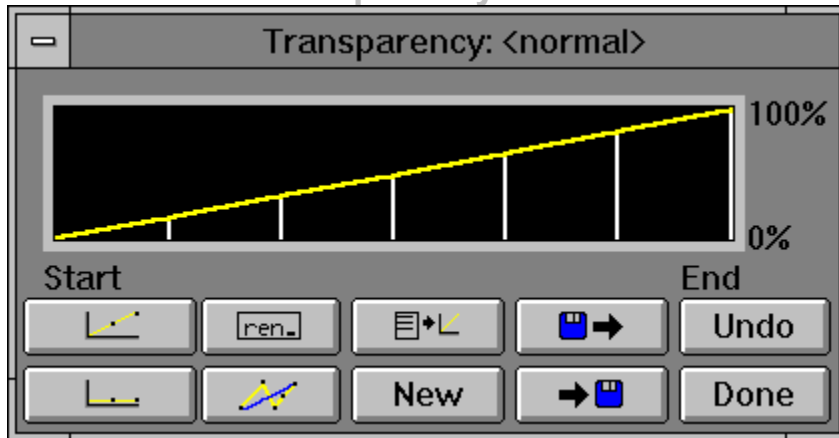
**Load:**  Load a velocity curve.

**Save:**  Save the shown velocity curve.

**Undo:** Returns the curve to the state before the last set of changes were made.

**Done:** Closes the Velocity Curve Control window.

## Section 6.6.2 Transparency Curve Window




Transparency curves are used to control the amount of fade from the start image to the end image. This transparency level can be set


There can be any number of curves in morph at one time. The first curve is named <normal>. Control points or lines can be associated with a transparency curve making the area around the point or line fade as specified by the curve. The <normal> curve is associated with all points/lines by default. Each curve can be adjusted by clicking and dragging it with the pointer. Curves can be independently loaded and saved to disk.


**The buttons on the window are as follows:**

**Transition:**  Sets the transparency to smoothly fade from start to end.


**Distortion:**  Set the transparency to NONE, so that all color in the result comes from the start frame.


**Rename:**  Changes the name for the currently viewed curve.

**Smooth:**  Smooths changes made the curve.

**Choose:**  Selects a different curve to view and change.

**New:** Creates a new transparency curve. The default shape for the curve is smooth like <normal>.

**Load:**  Load a transparency curve.

**Save:**  Save the shown transparency curve.

**Undo:** Returns the curve to the state before the last set of changes were made.

**Done:** Closes the Transparency Curve Control window.

## Section 6.6.3 Sequence Controls

The screenshot shows the 'Sequence Controls' dialog box. It is organized into several sections. The 'Frame Control' section at the top left includes input fields for 'Total Frames' (set to 15), 'Begin Frame #' (set to 1), 'Current Frame #' (set to 11), and 'Finish Frame #' (set to 15). To the right of this section are checkboxes for 'Save Result' and 'Anti-alias', both of which are checked. Further right are 'OK', 'Help', and 'Cancel' buttons. Below the 'Frame Control' section is the 'Output File' section, which contains a text field for the 'Output Image Path+Name' (C:\IMAGES\girlfrog), a dropdown for 'Extension' (AVI), a 'Specify' button, a 'Save File as Type' dropdown (Video for Windows (\*.AVI)), a 'Color Depth' dropdown (24-bit full color), a 'JPEG Quality' slider (0 to 100), and a 'Compression' checkbox. The 'Output Size' section at the bottom left includes input fields for 'Horizontal' (96) and 'Vertical' (72) dimensions, and buttons for 'Match Start Aspect Ratio', 'Match End Aspect Ratio', 'Set to Start Frame Size', and 'Set to End Frame Size'.

This dialog contains all of the tools the user will need to set the output parameters of a morph sequence. This includes morph length, resolution, and file type. Below is a brief description of each of the controls in the **Sequence Controls** dialog.

### Total frames:

The total number of frames in the morph. The film strip is also this number of frames in length.

### Begin Frame #:

This is the frame number where morphing will begin for a sequence generation.

### Finish Frame #:

This is the frame number where morphing will finish for a sequence generation.

### Current Frame #:

When 'Do one Frame' is selected, this is the frame that will be created. For example, if you set total frames to 15. A current frame of seven will generate the middle frame, half way between the Start and End frames. If you then set Begin Frame to 1 and Finish Frame to 15, all the frames of the morph animation will be generated.

### Use Anti-Aliasing method:

Anti-aliasing affects the spacial (or position) accuracy of the morph result in distances less than one pixel width. Have this switched on for the best quality result, or switched off for slightly faster operation.

### Save Result:

When a morph frame is generated, this switch tells the program to automatically save the resulting image. You must have this selected to save to an Animator FLIC animation, because each frame needs to be saved as it is created.

### Output file:

The file name that will be used when the morph result is automatically saved.

**Specify:**

This opens a file requester to locate a valid path, file name, and output format for the output file. When saving to an Animator FLIC animation this file name will be used directly. Otherwise, the last four characters of the file name (before the extension) will be replaced with the frame number (0001 to 9999).

ie.

**C:\IMAGES\ MYIMAGE.TIF** will be changed to

**C:\IMAGES\ MYIM0007.TIF** for frame seven.

**Output size:**

This is the resolution of the morph results created. It is the main determinate of the output quality. The film strip resolution is not the same as this size; however, the filmstrip quality can never be better than the output resolution.

For example,

**320 x 200** is a low resolution VGA output,

**640 x 480** is a high resolution VGA,

**768 x 482** is about home video resolution (NTSC).

**768 x 512** is about home video resolution (PAL).

**Match Start Aspect Ratio -**

Matches the output size to the ratio of dimensions of the Start Frame.

**Match End Aspect Ratio -**

Matches the output size to the ratio of dimensions of the End Frame.

**Set to Start Frame size -**

Matches the output size to the exact dimensions of the Start Frame.

**Set to End Frame size -**

Matches the output size to the exact dimensions of the End Frame.

## Section 6.7 The Status Bar



Click on any of the tools for quick help or look below for detailed documentation.

### Status Bar Controls

**Current Object (Ob):** The Current Object display will show the number of the currently selected object. An object is defined as any point or line defined in either the start or end image. This will display the currently selected object, and any associated transparency or velocity curves. These curves are numbered based on how they appear in the curve list. For example, the default transparency list is normal, early, late. So for this example, a normal curve would be 1, a early curve would be 2, and a late curve would be 3. All time line objects can be selected by right clicking on the line or point. This will also change the line or point's color from the default color to the selected color.

**Current Cursor Position (At):** The At area displays the current pixel position in the image for points and lines. The image coordinates will only be displayed if an image has been loaded into the start or end frames. This coordinate system can be useful for exact specification of points and lines for a morphing sequence. The coordinates are displayed in an X and Y format with X=0, Y=0 being the top left corner of the image.

This area is also used to display the name of the object that the cursor is currently over. The example above shows the Oval drawing tool to be the current position of the cursor. Once you are over an object, you can press the F1 key to access the documentation for that object. This is true for all objects that are defined by the **At:** display.

**Operation Progress Bar:** This area will display the current progress percentage for each operation in the program. The progress bar will be used for loading, saving, rendering, and all other operations. This area will display the progress for each portion of a morph as it is executed. The progress bar to the right of this display will show the overall progress for the whole morphing sequence.

**Sequence Progress Bar:** The Sequence Progress Bar displays the current progress percentage for an entire morphing sequence. This progress bar is also used for progress of FLI/FLC saves and multiple image file loads.

**Pause Sequence:** This control will pause the generation of the morph when it becomes possible. You can not pause the loading or saving of image files. Once the pause button has been pushed, the sequence can be restarted by pressing this button again. Pausing a sequence allows you to temporarily suspend all of morph's CPU activities. This allows you to utilize the computer for another CPU intensive task (like printing), and then return to morph to restart the sequence.

**Stop Sequence:** Pressing this button will stop and cancel the current operation sequence. Once this button has been pressed, all save and sequence operation will stop.

## Section 6.8 Keystrokes

### Commonly used Keystrokes in Morph:

**a/A** - Show/Hide area tools

**b** - Set velocity by drawing a freehand area

**c/C** - Open/Close chronograph

**e** - Eject filmstrip

**f/F** - Show/Close filmstrip

**g** - Set velocity by drawing a rectangle

**k** - HELP file on keystrokes

**l** - Show splash page

**o/O** - Open/Close Onion Skin view

**p** - Animate filmstrip

**s** - Set sequence controls

**v/V** - Show next or previous view

**y** - Set velocity or transparency for the current object

**z/Z** - Zoom/Negative Zoom an image view

**left/right arrow keys** - Select next object

**DEL** - Delete current object

**ENTER** - When an object is partly drawn - closes the area and adds it in both views

When in Move/Edit mode - converts the freehand line to a bezier

## There are several factors which affect Display Quality:

### **(1) DISPLAY TYPE.**

A 24-bit display represents the image exactly. 256 color displays show fewer colors and therefore show the image less accurately. You should choose a display option that matches your hardware configuration.

### **(2) DISPLAY RESOLUTION.**

Morph takes advantage of high resolution displays by allowing you to scale windows to any size.

### **(3) IMAGE RESOLUTION.**

A low resolution image will still look blocky, even on a high resolution display.

### **(4) IMAGE QUALITY.**

Low color images cannot be restored to full color. Full color images such as 24 and 32 bit Targa and 24-bit TIFFs use 16.8 million colors. An 8-bit BMP, by comparison, may only use 256 colors.

To produce full color morph results, start with full color Start and End images. **Note!** Even though your display hardware may not be capable of 24-bit display, Morph holds and processes images as full color 24-bit at all times.

## Error and Information Messages

Message 000

Message 001

Message 002

Message 003

Message 004

Message 005

Message 006

Message 007

Message 008

Message 009

Message 010

Message 011

Message 012

Message 013

Message 014

Message 015

Message 016

Message 017

Message 018

Message 019

Message 020

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[Message 075](#)

[Message 076](#)

[Message 077](#)

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[Message 085](#)

[Message 086](#)

Message 089

Message 090

Message 091

Message 100

Message 101

## Message 000

### **Not enough memory to render**

The program was not able to get enough memory to render (draw) the image for display. Try making more memory available by closing other programs or make the view windows smaller. (see [Making More Memory Available](#))

## Message 001

### **Not enough real memory for film.**

A film strip is really a string of images. When a film strip is created for the first time or when a new image is copied to the film strip morph must keep one frame of the film strip in real memory . This message means that morph could not get the memory for one frame of the film strip during its creation.

Try making more memory available by closing other programs or make the film strip resolution (not view size) smaller. (see [Making more Memory Available](#))

## Message 002

### **Not enough real memory for film record.**

A film strip is really a string of images. When a film strip is created for the first time or when a new image is copied (or recorded) to the film strip morph must keep one frame of the film strip in real memory . This message means that morph could not get the memory for the record of frames for the film strip.

Try making more memory available by closing other programs or make the film strip resolution (not view size) smaller. (see [Making More Memory Available](#))

## Message 003

### **Not enough real memory for film insertion**

A film strip is really a string of images. When a film strip is created for the first time or when a new image is copied (or inserted) to the film strip morph must keep one frame of the film strip in real memory. This message means that morph could not get this amount of memory during the recording of one frame to it.

Try making more memory available by closing other programs or make the film strip resolution (not view size) smaller. (see [Making More Memory Available](#))

## Message 004

### **Not enough memory for new film.**

When the existing film strip in memory is resized, a new film strip is created and the old film strip copied to the new one. This requires scaling to the new frame resolution and clearing new frames if the new film strip is longer than the old one. This message is displayed if there was not enough memory for the new film strip in addition to the old one.

Try making more memory available by closing other programs or make the new film strip resolution and size smaller. (see [Making More Memory Available](#))

## Message 005

### **Large Film window height is not recommended.**

This is an informative message to suggest that a large film window height will require a large amount of computer resources as explained in Section 6.5 The Filmstrip. This message will not be displayed a second time from the same window.

To insist on the new size, click on the Done button again.

## Message 006

### Could not open the image file.

The program could not find or open the image file asked for.

Check to see that the image file exists and has the same name specified. If it does check that no other program is requiring exclusive access to it. Under the MS-DOS operating system the **FILES=** line in your CONFIG.SYS file may specify a number that is too small.

## Message 007

### **Not enough memory for new image.**

The program was not able to get enough memory to hold the new image. Memory requirements for an image are calculated by  $\text{Width} \times \text{Height} \times 3$ .

Try making more memory available by closing other applications or by specifying a larger area for virtual memory in Windows. (see [Making More Memory Available](#))

## Message 008

### **Could not write the file header.**

When trying to save an image file, the file was created but the program could not save the first part of the image specification.

Check that there is enough space on the disk being saved to and that the disk is free from bad sectors.

## Message 009

### **Could not write the palette.**

When trying to save an image file, the file was created but the program could not save the image palette.

Check that there is enough space on the disk being saved to and that the disk is free from bad sectors

## Message 010

### **Could not write the first frame.**

When trying to save a frame to an animation file, the file was found but the program could not save the image just created (frame 1).

Check that there is enough space on the disk being saved to and that the disk is free from bad sectors

## Message 011

### **No Start Frame loaded.**

An operation was asked for that requires an image in the Start Frame. When a start frame has been loaded, it will be displayed in the Start window.

Load a start frame by using the Menu option Load Start Frame.....

## Message 012

### **No End Frame loaded.**

An operation was asked for that requires an image in the End Frame. When an end frame has been loaded, it will be displayed in the End window.

Load an end frame by using the Menu option Load End Frame.....

## Message 013

### Unable to find transparency file

The transparency file requested was not found.

Check that a file of that name exists.

## Message 014

### **File is empty.**

The transparency file requested had no transparency curve information in it.

The file was possibly not successfully written when saved. Transparency files can be viewed with a standard text editor (not word processor).

## Message 015

### **File not found.**

The program could not find or open the file asked for.

Check to see that the file exists and has the same name specified. If it does, check that no other program is requiring exclusive access to it. Under the MS-DOS operating system the **FILES=** line in your CONFIG.SYS file may specify a number that is too small.

## Message 016

### **Not enough memory for new curve.**

When a transparency or velocity curve is created or loaded from disk, the program requires the following amount of memory:  $\text{Frames} \times 4 + 20$ . So, a 30 frame morph will require 140 bytes of memory for each curve it uses.

Try making more memory available by closing other applications or by specifying a larger area for virtual memory in Windows. (see [Making More Memory Available](#))

## Message 017

### **Incorrect file type.**

This is a rarely encountered error, meaning that the image file being loaded had an identifying header that showed it was one type of image, but that the actual contents of the file was inconsistent. This could happen if morph encounters a new image file type or if the file has been corrupted.

If you encounter an image file that you think WinImages: morph should load please send it to us (see the [Introduction](#) for phone numbers and address). We especially encourage use of our bulletin board service. Entirely new image file formats may require some additional file specification.

## Message 018

### **Image file type is not recognized.**

The program was unable to load the type of image file specified. (see [File Menu](#) Documentation for a list of currently handled formats.)

If you encounter an image file that you think WinImages: morph should load please send it to us (see the [Introduction](#) for phone numbers and address). We especially encourage use of our bulletin board service. Entirely new image file formats may require some additional file specification.

## Message 019

**No Film strip loaded or created.**

An operation was requested that requires a film strip.

Film strips can be loaded from disk or created by morphing.

## Message 020

**Both Start and End images need to be loaded.**

For operations such as morphing, images need to be loaded for the start frame and, unless a distortion (or warp) morph is specified, also into the end frame.

Load a start and end image and continue.

## Message 021

**One or more points are needed.**

To be able to morph control points are needed to specify the movement of the images.

Add control points to continue.

## Message 022

### **Not enough memory for operation.**

Operations such as morphing require working memory. If this message is displayed, the program has failed to obtain the working memory and will cancel the operation.

Try making more memory available by closing other applications or by using smaller images in the morph.  
(see [Making More Memory Available](#))

## Message 023

### **Problem opening the window.**

The program opens windows for control of transparency curves and other morph parameters. In some circumstances, Windows cannot provide the program with the window it requires. This will happen if Windows uses all of its resources.

Try closing other applications.

## Message 024

**Could not get the file header.**

When reading a file, the program could not read past the start.

The file may be corrupted.

## Message 025

### **File is truncated.**

When reading an image file, the program could not get all of the image data.

The file may have been corrupted by a bad disk or incomplete save operation. When possible, the program will continue after this error and show the part of the image that was successfully loaded.

## **Message 026**

### **Problem writing file.**

When saving a file out to disk, the program could not complete writing.

Check that the disk has enough free space to hold the file.

## Message 027

### **Not enough real memory for image.**

For operations such as morphing, the data for the start and end frames and for the result must all be in memory. This message is displayed if the program cannot put all the images in memory at once.

Try a smaller morph size and smaller start and end images. Users with 386 or higher computers can also utilize virtual memory, and effectively use more memory than the computer can actually store using its memory chips.

## Message 028

**You need to add points before adding links.**

Links are used to connect points. Before links can be added you must specify some morph control points.

## Message 029

**You need to add points before moving them.**

The right mouse button can be used to move points once they have been added with the left mouse button or loaded from disk.

Add some control points with the left mouse button.

## Message 030

**The current frame is larger than the total number.**

The range of frames set in the Sequence Controls panel should be between one and the last frame number.

Change the Current Frame to be greater than zero and less than or equal to the number of Total Frames.

### Message 031

**Morph entered without any control points.**

Control points need to be added to the start or end frames with the left mouse button and moved to specify the appropriate image motion before morphing.

## Message 032

**Number of frames must be more than one.**

A morph specifies movement of an image. The movement is shown over a sequence of frames. So, the number of frames of the morph must be two or more.

### **Message 033**

#### **Could not open new project file.**

While trying to save the project data to disk, the program could not open the file.

Check that the disk is not write protected or if the file is being saved to the root directory of an MS-DOS disk, that the root directory has not reached its maximum number of files.

### Message 034

#### **File is not a Morph Project File.**

A request to load a project file was made but the file found did not have an **MPROJECT** identifier in the first line.

### Message 035

**No result frame has been generated yet.**

A request to save the result frame was made before one was created by morphing.

## Message 036

### **File is not a TIFF image.**

When trying to load a TIFF image file, the contents of the file was not consistent with the identifying header.

The file may be damaged.

### **Message 037**

**Could not create the new image file.**

The program was unable to create a new file to hold the image being saved.

Check that the disk being written to is not write protected and that it has some free space.

## Message 038

### **Not enough memory for velocity curves.**

When a transparency or velocity curve is created or loaded from disk, the program requires the following amount of memory:  $\text{Frames} \times 4 + 20$ . So, a 30 frame morph will require 140 bytes of memory for each curve it uses.

Try making more memory available by closing other applications or by specifying a larger area for virtual memory in Windows. (see [Making More Memory Available](#))

## Message 039

### **Not enough Memory to add Link.**

Morph uses just eight bytes of memory to store each link.

Try making more memory available by closing other applications or by specifying a larger area for virtual memory in Windows. (see [Making More Memory Available](#))

## Message 040

**A point needs to be selected first.**

To delete a morph control point, or have its velocity or transparency curve assigned, the point must be selected first with the right mouse button. The currently selected point is displayed in aqua.

Select a point with the right mouse button before selecting this operation.

## Message 041

**No points have yet been added.**

Before a morph control point can be deleted, or have its velocity or transparency curve assigned, there has to be at least one point added.

Add control points with the left mouse button before selecting this operation.

## Message 042

**File does not match the type requested.**

A request to load a file was made, for example, a morph control points file, but the file was not recognized as the type asked for.

Check that the file is the type asked for.

## Message 043

### **Not enough memory for I/O buffer.**

When loading image files, such as TIFF, the program requires a small amount of real memory to hold incoming information. This greatly increases the speed over how an image file could otherwise be read. This message means that Windows was unable to provide that amount of buffer memory (usually 1024 to 4096 bytes).

Try to make more memory available. (see [Making more Memory Available](#))

## Message 044

### **Not enough memory decompression buffer.**

When loading compressed image files such as BMP or TIFF the program uses about 20k (20,000 bytes) of real memory to decompress the image. This amount of memory may be larger for images that are wider than 1024 pixels. This message means that the system was unable to provide the required amount of memory.

Try to make more memory available. (see [Making more Memory Available](#))

## Message 045

### **Decompression over-run in file.**

When loading a compressed image file (usually an Animator FLIC) the program had trouble decompressing (or in other words understanding) the data. This may mean that the file has been corrupted or that a compression method is in operation that WinImages:morph is not familiar with.

As with other file formats, if you have confidence that the file is OK, send the file to Black Belt Systems Technical Support along with a note describing the problem (we encourage you to use the Black Belt Bulletin Board at 1-406-367 2227) and we will endeavor to extend the loader to handle it.

## Message 046

**The current frame is before start.**

The range of frames set in the Sequence Controls panel should be between one and the total number of frames.

Change the Current Frame to be greater than or equal to one.

## Message 047

### **Start image not specified for this frame.**

When trying to do a motion morph, the program needs to know a list of start images, end images, and control points. A start image and end image has to be specified for each frame of the morph. This message means that the list of start images was incomplete; and did not have a start image specified for this frame number.

Specify the start image for this frame number in the Motion Morph controls.

## Message 048

### **Start image not specified for this frame.**

When doing a motion morph, the program needs to know a list of start images, end images, and control points. A start image and end image has to be specified for each frame of the morph. This message means that the list of end images was incomplete; and did not have a end image specified for this frame number.

Specify the end image for this frame number in the Motion Morph controls.

## Message 049

### **Control points not specified for this frame.**

When doing a motion morph, the program needs to know a list of start images, end images, and control points. Control point files have to be specified for at least the first and last frames of the morph. This message means that the list of control point files was incomplete; and the program was unable to find a control point file or interpolate a set of control points for this frame.

Specify the control point file for this frame number in the Motion Morph controls, or specify control point files either side of this frame.

## Message 050

### **Not enough memory for new film frame.**

Each frame of the film strip is a 24-bit image when filled. This message means that when inserting a result image into a new film strip frame, the program was unable to get enough memory for the new film strip image.

Try to make more memory available (see [Making More Memory Available](#)) or reduce the film strip resolution specified in the FilmStrip menu.

## Message 051

### **Not enough memory for motion list.**

When building the area to store names of each frame in a motion morph, the program could not get the required memory. If the program cannot set up the motion morph, it will turn the motion morph selection off.

Try to make more memory available (see [Making more Memory Available](#)).

## Message 052

### **Operation is only for Motion Morphing.**

This message is displayed when an action was tried that is only valid when the Motion Morph selection is made. For example, you do not need to specify Motion Start Frames if not motion morphing.

If the action is what you intended, select Motion Morph from the generate menu first.

## Message 053

### Unable to create FLC/FLI file.

When saving the first frame of a morph to an Animator file, the program must create (or over-write) the output file. This message means that the program could not create the file. It is really saying that the operating system could not create the file for us.

#### Possible causes are:

- The Output file name in the Sequence Controls may be invalid.
- If saving to the root directory of a FAT file system disk, the maximum number of entries may be reached.
- The disk being saved to may be write protected.
- The disk being saved to may be full.
- Under the MS-DOS operating system, the FILES= entry in CONFIG.SYS maybe set too low.

Use the **Specify** button to verify the path and name of the output file.

## Message 054

### **Not enough memory to open program interface.**

When WinImages:morph begins, it requires a minimum amount of memory just to get started. This message means that the amount of memory (about 4k) was not available.

Try to make more memory available (see [Making more Memory Available](#)).

## Message 055

### **Points file not found.**

The points file specified in the file requester dialog or in the project file being loaded was not found.

Check the path and file name. If a project file was being loaded, you may need to tell WinImages:morph the path for points files by simply loading a point file from that directory and then loading the project , or alternatively change the project file, or load the files individually.

## Message 056

**Film strip is already ejected and empty.**

You have asked to eject the contents of the film strip, but each frame is empty, so ejecting will have no effect.

## Message 057

### **AVI files must be saved as a sequence.**

You have asked to save a single image (the start, end , or result image) as an AVI, however AVI files contain a sequence of frames.

To save to an AVI file select AVI as the **Save File as Type...** format in the **Sequence Controls** dialog, and select **Save Result**. Then you can generate the sequence. Morph will automatically save the result images as an AVI animation. You can also save the filmstrip as an AVI after generating a morph.

## Message 058

**Zoom or De-Zoom was requested with no images loaded.**



Either the **zoom** or **dezoom**



button was pressed, but there are no images loaded or viewed that can be zoomed.

Once an image is loaded and displayed in either the Start, End or Result window they can be zoomed for a more magnified look.

## Message 059

### **Animation file is being saved with incomplete frames.**

The filmstrip is being saved as a FLI or FLC, or AVI animation file but some of the filmstrip frames are empty. The animation file can still be saved, but unless the missing frames are added later, players will not be able to play the animation properly.

To successfully save an animation file, ensure that all the frames in the filmstrip have been generated, or loaded.

## Message 060

### **Not enough real memory for operation**

WinImages:morph is unable to execute the selected operation due to a lack of real memory. Try closing other applications to gain more memory.

**See Also:** [Making more Memory Available](#)

## Message 063

### **I-Shape file was not found.**

The IShape file that you specified was not found. Please verify the IShape name and path specifications.

## Message 070

### **Not enough memory for resulting image**

WinImages did not have enough memory to display the resulting image from a morphing sequence. Try making more memory available by closing other applications.

**See Also:** [Making More Memory Available](#)

## Message 071

**Could not open the requested file.**

The points or project file that you requested is not valid. Please verify the name, extension, and path for the points or project file.

## Message 073

### Could not write to the AVI file.

The AVI file could not be created because an output file path and name were not specified or the path/file name was invalid.

A valid file and path name would be: C:\images\mytest.AVI.

Some examples invalid paths/file names might look like this: C:\images\

.AVI

C:\\"

Specify the output path and file name in the **Sequence Controls** dialog in the **Generate** menu. It is strongly suggested that you use the **Specify File** button to ensure valid path and file names.

## Message 074

### **Animation file is being saved with incomplete Frames.**

The filmstrip is being saved as a FLI/FLC or AVI animation file, but some of the filmstrip frames are empty. The animation file can still be saved, but unless the missing frames are added later, players will not be able to play the animation properly.

To successfully save an animation file, ensure that all of the frames in the filmstrip have been generated or loaded.

## Message 075

**The loader for this file type was not found.**

The file loader that Morph requested was not found. This can happen if the DLL's that morph uses have the same name as another program's DLL.

Move the Morph DLL into the Morph root directory, or contact technical support about possibly changing the name of the DLL.

## Message 076

**The loader for this file type was corrupted.**

Morph attempted to access one of its DLLs, but the DLL has been corrupted.

In this case it may be necessary to re-install the program or the DLLs. Contact technical support for further information on re-installing DLLs.

## Message 077

### **System was unable to provide Timer.**

Morph was unable to obtain a system timer for the operation you specified. System timers are used to play the filmstrip at regular intervals, and in a few other areas of the program. This error message is very rarely encountered on most systems.

You can correct this error by stopping the filmstrip, or by turning off any other application that may be using a system timer.

## Message 078

**This operation cannot be done while program is Running or Paused.**

The operation or change that you have made can not be carried out while Morph is generating a sequence. For example, you can not change the number of frames in the sequence while it a sequence is being generated.

## Message 079

**The image file was too small to ID.**

The image file that you have specified does not contain enough information for a valid image file.

Check the name and directory of the specified file for errors.

## Message 080

**Could not find the image size from the file.**

The image file that you specified does not contain any information about the images size. Morph will not be able to properly load this type of file.

Please contact technical support if you find a supported file that exhibits this behavior.

## Message 081

**Two load operations have been requested simultaneously.**

You have selected to load two files at the same time. This operation can not be performed because the file loader can only load one file at a time. However, you are permitted to load a sequence of files using the drag and drop method, or by selecting multiple files from the file requester.

## **Message 084**

**Could not create the requested file.**

The time line file that you requested to save can not be saved to the directory you specified.

Check the directory and file name for errors.

## Message 085

**This cannot be done while an operation is in progress.**

The Operation that you have specified can not be carried out while another operation is in progress or paused. Wait for the operation to finish, and then try again.

## Message 086

**Placement mode cannot change while a placement is in progress.**

You have selected to change from a line mode to a point mode after specifying a line in one of the images. It is not possible to morph between a line and a point.

### Message 089

**There is no zoomed view to dezoom.**

You have selected to de-zoom an image view, and no views are zoomed.

## Message 090

### **Could not find the routine in the DLL.**

The DLL that the program found was corrupted, truncated, or has the same name as an F/x or Morph DLL. This can be fixed by re-installing the DLL's into your Windows directory.

## Message 091

### **The sequence output file already exists**

The output file name that you have selected for the sequence of frames already exists. You can select to overwrite the file with the new frames, or you can cancel the file save to select a new name for the sequence.

## Message 100

**The filmstrip is currently being rendered.**

You have selected to close the filmstrip or the program while the filmstrip is rendering. Wait until the filmstrip has completed its render before closing.

## Message 101

**LZW compressed TIFF (or GIF) files use techniques patented by UniSys and IBM. Clear legal title to the use of LZW is not possible to obtain at this time.**

Gif and the most common form of compressed TIFF use LZW compression. Both IBM and UniSys have patents on LZW. UniSys has recently instituted a fee for the use of LZW, after years of free usage. Until this matter is completely resolved, we will not load or save LZW compressed files.

## Making more Memory Available

Morphing and other image processing operations typically require large amounts of memory. If the program cannot get enough memory for a particular operation an appropriate message will be displayed. There are certain actions you can take to maximize the availability of memory to the program.

In some situations, you may be able to reduce the requirement WinImages:morph has for memory. The filmstrip can be an especially heavy memory user because each frame is a complete image. You can set a small filmstrip resolution or even close the filmstrip altogether when it is not needed.

Close other applications, especially other image processing programs that use large amounts of memory.

On '386 and higher processors you can specify a swap file for virtual memory use in Windows. A large swap file of 20 megabytes or more will help. Use a permanent swap file if possible. A permanent swap file will be static and contiguous and therefore minimizes disk fragmentation. With virtual memory you can load, for example, a 2400 x 1400 pixel image that takes 10 megabytes of memory on a machine with only 8 megabytes of RAM.

Of course, If your hardware and budget allow, you can buy and install more RAM.

## Supplied Examples

WinImages:morph is packaged with all the necessary files on Disk # 1 and Disk # 2

Additionally, Disk # 3 contains some example morphs to assist you gain a working understanding of the morphing process. The examples do not show the full range of possibilities. You can create many more varied effects with the package.

The example projects are as follows:

Project File -----	Start Image -----	End Image -----	Point File -----
CLOWNCAT.mpr	CLOWN.trm	CHEETAH.trm	CLOWNCAT.mpt
GIRLFROG.mpr	FIREGIRL.trm	FROGORIG.trm	GIRLFROG.mpt
ZOW.mpr	CLOWN.trm	CLOWN.trm	ZOW.mpt
BOUNCE.mpr	MOTNS01.trm	MOTNE01.trm	MOTNP01.mpt
	MOTNS02.trm	MOTNE02.trm	<tween>
	MOTNS03.trm	MOTNE03.trm	<tween>
	MOTNS04.trm	MOTNE04.trm	<tween>
	MOTNS05.trm	MOTNE05.trm	MOTNP05.mpt
	MOTNS06.trm	MOTNE06.trm	<tween>
	MOTNS07.trm	MOTNE07.trm	MOTNP07.mpt
	MOTNS08.trm	MOTNE08.trm	<tween>
	MOTNS09.trm	MOTNE09.trm	<tween>
	MOTNS10.trm	MOTNE10.trm	MOTNP10.mpt
	MOTNS10.trm	MOTNE10.trm	<skip>

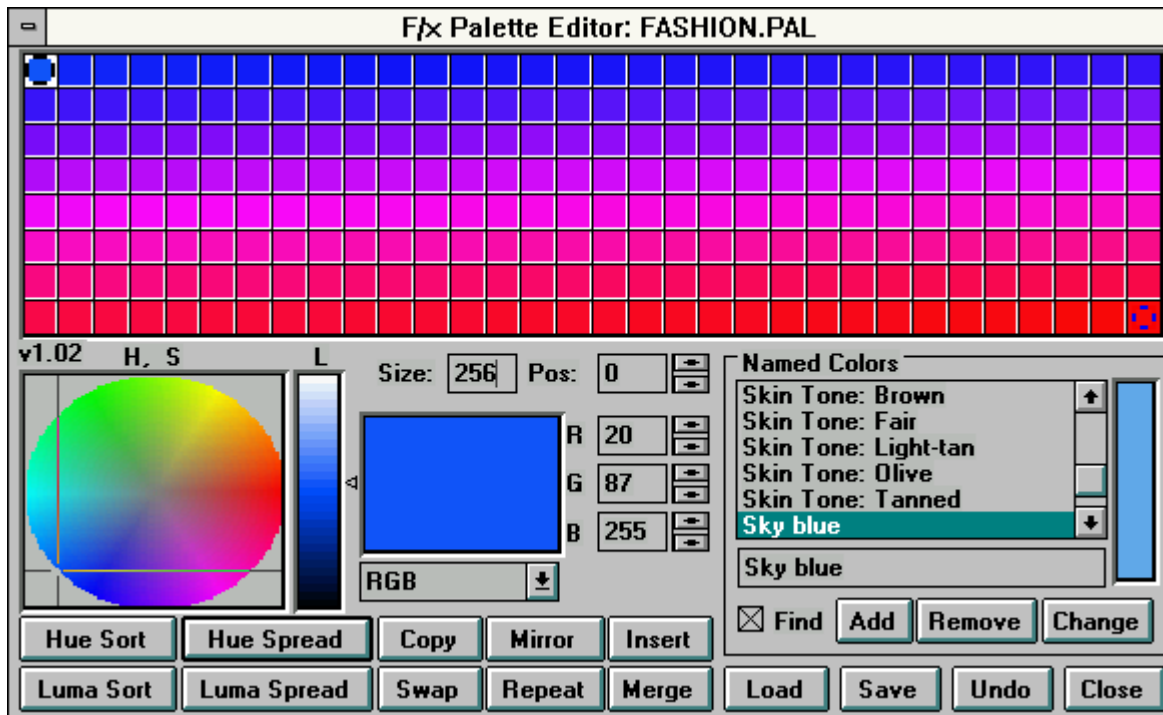
This last project **BOUNCE.mpr** is a motion morph and so requires one pair of images for each of its eleven (11) frames.

Because project files contain the full path of the images, you will have to change the project files **if** the images or data files are moved to a different directory.

The installation procedure will set the paths in the example project files for you. Additionally, when loading a project, the path where the project file was located is used as an alternative path for images and data files. Your default image and data path is also checked. So, projects can be directly loaded from the distribution diskette.

If after all these searches, your project files still cannot locate the images, then try loading the projects manually: start frame, then end frame, and then point file.

## The Color Palette Controls



*Click on any of the functions for quick help or look below for detailed documentation.*

WinImages:morph's palette control allows you to manipulate and alter existing palettes or create new palettes and ranges of color. The Palette controls include operations that will merge two palettes, insert a new palette, mirror the palette, and create various color spreads and sorts. This tool is particularly useful for loading a specific palette for an animation, thus keeping the original palette intact, or for editing a palette to remove or add colors in an animation. Morph's palette can load Microsoft Windows Paintbrush palettes, AVI (Video for Windows) palettes, Bitmap palettes, Adobe Color Table (ACT) palettes, and IFF palettes. The palette itself is broken up into a number of squares which contain the colors in the current palette. You have the option to increase or decrease the number of squares or cells available in the palette. Your palettes can contain anywhere between 2 and 1024 separate color cells. Throughout the remainder of the documentation the terms "left color" and "right color" will be used to describe the to palette position selectors. The "left color" is a white with black marker that outlines the current color. This color can be altered using the Hue and Saturation Color Wheel, or the provided RGB text entry fields. This color is the starting point for all spreads, sorts, and mirrors. The left color position can be altered by clicking on the palette with the left mouse button. The "right color" is a blue and red marker which defines the ending position for all spreads, sorts, and mirrors. You can not manipulate the right color. You do have the option of copying the left color into the right color position, or you can move the left color to the right color position to alter the color, and then move the left color back to its initial position. The right color's position can be altered by pressing the right mouse button while over the desired palette position.

### Related Topics:

[The Palette Controls:](#)

## The Palette Controls:

**Hue and Saturation Color Wheel:** The Hue and Saturation color slice allows you to select a color's Hue and Saturation values. These values are then combined with the Luminance setting (the control to the right) to create a color. The Hue and Saturation "wheel" begins with red and then moves through yellow, green, cyan, blue, magenta, and then back to red. The color is "purest" (has the most saturation) at the edge of the wheel, and as you move in towards the center of the wheel the saturation drops. The center of the wheel is a greyscale value. A color is selected by simply clicking, and holding the left mouse button on the color wheel. You can then move the mouse towards the desired color. The current color that the mouse is over will be displayed in the Color Preview Box to the right of the luminance control. Once you have the color you desire, or a lighter or darker version of the desired color, release the left mouse button. Remember, the left mouse button controls the "left color" or the beginning of any range spreads. You can place a color in the "right color" or end of the range spread by copying the desired color from the left color, and then setting the right color to the desired color. The "brightness" of the color can be altered using the Luminance control. For example, you have a Red color (R=225, G=25, B=32, and Luminance at about 50%), but it is not dark enough for the range you are creating. So, you would adjust the Luminance to about 25%, and the new red would be much darker (R=102, G=15, and B=25). You do not need to use the color wheel and luminance color to create or specify colors. You have the option of manually altering the RGB (or CMYK, HSL, etc.) values in the provided text entry fields. By doing this you can increment one or more of the components to a specific value. For more information on using the Hue and Saturation wheel, please refer to the sections below on creating spreads and ranges of colors.

**Luminance Control:** The Luminance control allows you to specify the brightness or luminosity of the color in the preview area. The Luminance is measured on a percentage scale from 0 to 100. A setting of zero will result in no luminance (black), and a setting of 100 will result in the maximum possible luminance (white). This is true regardless of the current selected color. For example, a red color can be made black by setting the Luminance control to 0 (bottom of the Luminance control), or it could be made white by setting the control to 100 (top of the Luminance control). A setting in the middle of the control (50%) will produce colors which are completely saturated or "pure colors". The luminance is set by simply clicking, and holding, the left mouse button over the luminance control. As you move the mouse, you should see the color in the preview increase or decrease in brightness as you move the mouse up and down the control. The preview will reflect all changes that you make to the luminance as they are made. When you have the desired color, release the left mouse button. The color you see in the preview will also be placed in the "left color" position.

**Color Preview Box:** The preview box contains the currently selected "left color". This color can be specified using the Hue and Saturation color wheel, or the RGB entry fields to the right of the preview. Any changes made to the color wheel, luminance control, or the RGB entry fields will be directly reflected in the preview color and the "left color" in the palette itself. This color can then be copied to the "right color" position by selecting the **Copy** button.

**Size:** The Size control is used to set the actual size or number of colors in the palette. This value can range between 2 and 1024 colors. If you increase or decrease the size of the current palette, either more cells will be added or some of the current cells will be eliminated. The cell size will decrease as the number of colors increase. This means that a palette of 1024 colors will have extremely small cells for the colors in the palette. If you are loading a palette which contains more colors than the current palette, morph will automatically increase the size of the palette to accommodate the new palette.

**Position:** The Position control displays the current "left color" position, and can be used to manipulate the position of the left color marker. The up and down arrows can be used to move the left color marker through the palette, or you can enter a value in the provided text entry field. If you specify a numeric value which is beyond the size of the current palette, morph will place the left color marker in the last available color cell. Remember, manipulating the Hue and Saturation color wheel, the Luminance slider, or the numeric color inputs **will change the current left color**. This is done regardless of the position of the left color marker.

**Color Spaces:** This drop down box contains a wide variety of colors spaces commonly used in graphics, desktop publishing, desktop video, and NTSC video. The color spaces include RGB (red, green, blue), CMY (cyan, magenta, yellow), CMYK (cyan, magenta, yellow, black), HSL (hue, saturation, luminance), HSV (hue, saturation, value), and YIQ (luminance, chrominance). The default color space is RGB, but can be changed at any time by accessing this dialog, and double clicking on the desired color space. Once the new color space has been selected, all of the values will be recalculated to reflect the differences between the spaces. It is important to remember that morph is dealing with pure colors, **not** real colors. This allows for conversion from color space to color space without altering the current "left color". The color space's letter equivalents will be placed in front of the appropriate dialog, and can be altered as described below.

**RGB (or CMYK, CMY, HSV, HSL, YIQ):** The RGB controls allow you to enter specific Red, Green, and Blue values for the current "left color". Each of these components has two methods of entering the desired color values. The first is to simply manually enter the exact numeric values. This will alter the preview and "left color" colors. The second method is to use the up down gadgets located to the left of each text entry field. These allow you to increase or decrease the desired color component by clicking on the appropriate gadget (up for a value increase and down for a value decrease). You should notice that there are multiple color spaces available to you. You can alter the change the current color space by following the procedure described in the above section.

**Hue Sort:** The Hue Sort control will sort all of the colors currently **between** the left and right colors. This sort will rearrange the colors according to their individual hue settings. This includes all greyscales and color values between the left and right color markers. The hue sort begins with red and then moves through yellow, green, cyan, blue, and ends with magenta. If a greyscale color contains a portion of one of the above mentioned colors, it will be sorted in that color group. The colors themselves are sorted with the groups based on their saturation. This means that darker colors will always come before lighter colors of the same hue. You also have the option of sorting the colors "backwards" by pressing the **Shift** key and then this button. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Luma Sort:** The Luma Sort option allows you to sort all of the colors in the current palette by their luminance or brightness. Once this option is selected, morph will evaluate the palette and reorder the colors based on each color's RGB brightness value from dark to light. If you were to select this option for the default palette, you would notice that the palette is already sorted on luminance. The sort will only occur between the "left color" and the "right color" of the palette. All other colors outside of these markers will not be altered. You also have the option of sorting the colors "backwards" by pressing the **Shift** key and then this button. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Hue Spread:** The Hue Spread option will create a spread of colors between the current "left color" and "right color" using the hue values of those two colors. There are two methods of applying the Hue Spread. The first is to simply press the Hue Spread button. This will produce a spread of colors

between the current left and right colors without cycling through the complete hue spectrum. For example, a Hue Spread from red to magenta would simply create a range from red to magenta without cycling through yellow, green, cyan, and blue to get to magenta. This method can be thought of as a "shortest path" method. This means that morph will take the shortest Hue distance to reach the specified right color. The second method requires you to press and hold the **Shift** key while pressing the Hue Spread button. This will cause the new range to go through all of the colors linearly to reach the specified right color. If we use the above example, the hue spread from red to magenta would start with red, pass through yellow, green, cyan, blue, and would end with magenta. It is important to remember that the spread will only evaluate the current left and right colors. All other colors in the palette will be ignored. This includes all of the colors between the left and right colors. The new colors created by this spread will be determined by the initial left and right color. For example, setting the left color to red (R=255, G=0, B=0) and the right color to magenta (R=255, G=0, B=255), and then applying a hue spread, with the shift button down, between the two will create a range of colors that is very similar to the Hue and Saturation color wheel (beginning with red and then moving through yellow, green, cyan, blue, and ending with magenta). It is important to remember that morph does not always have to cycle the colors when doing a hue spread. For example, a non-shifted spread between yellow and red would be the exact inverse of a non-shifted spread between red and yellow. This is done to allow you the option of creating color ranges that are the inverse of one another. It is important to remember that pressing the **Shift** key in conjunction with this button will cause the spread to "cycle" through the hue space to create the spread. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Luma Spread:** The Luma Spread operation allows you to create a spread or range of colors between the current left and right colors based on their initial luminance. The luminance that morph uses is a measure of actual RGB brightness of the left and right colors. For example, the Hue Spread mentioned above went from red to magenta based on the hue values of the left and right colors. A Luma Spread of the same two colors would differ in that the colors created by the spread operation would be "between" red and magenta. The colors that are created would gradually shift in brightness and shade from red to magenta, with each color being slightly darker or lighter than the previous. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Insert:** The Insert option allows you to insert a palette of colors based on the position of the "left color" marker. This allows you to insert or append another palette into the current palette. After you have selected this button, you will be presented with a file requester for selecting the palette to be inserted. Once you have selected the desired palette file, select the **Ok** button. This will automatically load and insert the specified palette in the current left color position. If the palette which is being inserted is larger than the remaining space in the palette, the additional colors will be placed beyond the total number of visible colors. If you were to increase the total number of visible colors in the palette (increase the **Size** value), the colors that were inserted beyond the original palette will become visible. Morph will only use the number of colors specified in the Size control regardless of any colors that have been inserted beyond the visible palette.

**Merge:** The Merge option is used to merge together two separate palettes. The first step in using the merge option is to load the palette which will have colors merged into it. The next step is to press the **Merge** button. This will access a file requester which can be used to select the palette file to be merged. Once you have selected the desired palette file, press the **Ok** button. Morph will now merge the two palettes by comparing the colors of both palettes, and selecting the colors which best represent both palettes. This tool is especially effective for creating render palettes for animations based on two

separate palettes.

**Copy:** The Copy button will copy the current left color into the right color. This can be useful for specifying the right color for spreads and sorts. After you have copied the left color, you can then specify a new left color to be used for multiple color spreads.

**Swap:** The Swap option will swap the current left and right color. Only the colors will be swapped. The left and right color markers will remain in the same position. Pressing Swap again will return the colors to their original position.

**Mirror:** The Mirror operation will mirror the colors in between the current left and right color markers. The mirror will be a "reflection" of the range of colors based on the center position of the range. Morph will have to eliminate some colors to do this, but the overall effect is very dramatic. For example, if there were 32 colors between the left and right color markers, only 16 colors would be used and reflected inside the 32 color range. This means that half of the colors will be eliminated. You also have the option of applying multiple mirror's to the same range which can create some very stunning results. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Repeat:** The Repeat option will repeat the range of colors currently between the left and right color markers. Morph will evaluate the colors that it finds, and will then repeat the entire range of colors inside the two markers. For example, if you were to repeat the default greyscale palette, you would see two ranges of colors that start with black and move to white. Selecting the Repeat button again will repeat the two greyscale ranges, and will create a palette with a total of four black to white ranges. You should also notice that some of the colors are eliminated. This is due to the fact that morph will only repeat within the left and right markers. This means that some colors will be eliminated. For example, if you placed the left marker in position 0 and the right marker in position 31, only the colors between positions 0 and 32 would be repeated. This is a total of 32 colors in-between the left and right marker. This means that morph will select 16 colors from the original 32, and then repeat them. In this case, morph would select every other color in the range, and then repeat these colors. You can always undo the last change that you've made to the palette by selecting the palette's **Undo** button.

**Named Colors:** The Named Colors section of the Palette dialog allows you to give names to specific RGB values. For example, the default named colors file (colorset.ini) contains such colors as Cobalt Blue and Carnation Pink. These two colors have specific RGB values, but also have a name associated with them. The controls in this portion of the dialog can be used to add additional colors and names to the colorset.ini file, remove colors from the file, or replace existing colors with new RGB values or names. A named color is placed into the palette and preview color box by simply selecting the desired named color, and then clicking on the named color preview color box to the right of the list. This will automatically place the named color into the left color position of the palette, and will adjust the RGB values accordingly. The intent of the named colors are to allow you to specifically name colors that you use frequently. This means that you no longer have to remember an obscure RGB value, but can instead remember a name which describes the color in question.

All of the Named Colors are kept in a ASCII text file called **colorset.ini** located in your Windows directory. You can use any Text Editor to add new named colors to the file. You may find this method to be faster if you are entering multiple colors and names. The instructions at the top of the file describe the method for adding new colors to the list. Once you have added the desired colors and names save the file and exit the text editor. The next time that you open the palette the new named colors will be available. Remember, the named colors file (colorset.ini) is used for both the palette and the **Pick Color** selection

dialog. This is **not** the only method of adding colors to the named colors list. Named colors can be added to the list in both the palette and color selector by pressing the **Add** button. Its use is described below in the Add documentation.

**Find:** The Find control, when selected, will force morph to find the color in the named colors list that is **closest** to the current color in the Preview Color box. For example, if you were selecting a color with the Hue and Saturation color wheel, you would see the current named color shift from name to name (color to color) as you move the mouse pointer over the color wheel. Remember, this is the closest color in the named color list. The current preview color can be added to the named color list by entering a new name, and then pressing the **Add** button. This will add the color to the list with the specified name and color space values (RGB, CMYK, HSL, etc.). If the find control is not selected, the current name color will only change when a new color is specified or selected using the provided list requester.

**Add:** The Add control is used to add new colors to the named colors list. New colors are added to the list by selecting the desired color, entering a name for the color, and then pressing the Add button. The color can be selected with the Hue and Saturation color wheel, or by the manual RGB numeric entry fields to the right of the color wheel. After the color is set, enter an appropriate name for the color. Morph will place the color directly above the currently highlighted named color. Morph will not automatically alphabetize the new named color entry. If you would like the list to remain alphabetical, you will need to manually select the appropriate location for the new named color. After you have the color set, named, and ready to go into the desired position in the list, press the Add button. This will automatically place the new name and color into the list, and make it the current named color. Remember, clicking on the named color preview box (to the right of the name list) will place the color in the current left color position as well as alter the RGB values to their appropriate settings.

**Remove:** This control is used to remove colors which are no longer needed. The remove control works by simply selecting the color to remove, and then pressing the Remove button. Once a color is removed from the list it will not appear again unless the color is re-added at a latter time. The remove feature can also be used to remove newly added colors that are in the wrong position in the list. You also have the option of Changing the color instead of removing it.

**Change:** The Change control is used to change the name or RGB values of the currently selected named color. You have the option to change the name, the color, or both. The first step in changing a named color is to select the color to be changed. If you are going to change the name, but not the color, you must first click on the named color preview color box to the right of the names list. This will place the current named color into the palette color preview. Next, enter the change to be made to the name, and press the Change button. This will replace the old name with the new name, but will not alter the actual color. If you would like to change only the color, do not click on the named color preview color. Instead, alter the color using the Hue and Saturation color wheel, or the manual RGB entry fields. After you have the desired color in the palette color preview, press the Change button. You can follow the same procedures to change the name and color. The only difference is that after setting the color you will also need to alter the name. Once that is complete, you can select the Change button to alter the color and color name. The changes made to the named colors list will be saved colorset.ini file when the palette is closed.

**Load:** This will load a previously saved palette. The current palette will be eliminated, and morph will automatically resize the palette to best fit the newly loaded palette. Morph's palette can load Microsoft Windows Paintbrush palettes, AVI (Video for Windows) palettes, Bitmap palettes, Adobe Color Table (ACT) palettes, and IFF palettes. The palette can also load custom palettes that have been saved using the Save option. Pressing the load button will access a file requester for selecting the desired palette

file. Once you have the palette selected, press the **Ok** button to load the palette. Remember, once a new palette is selected for loading, the current palette will be lost.

**Save:** This control will save the current palette. The palette will be saved with a **.pal** extension. Once a palette is saved it can be reloaded using the Load option. After the save button is pressed, a file requester will appear. After you have specified the desired directory, file name, and extension, select the **Ok** button. This will save the palette with the specified name and extension. It is possible to load morph palettes into Video for Windows' Palette Editor. Palettes which exceed 256 colors will be truncated by the Video for Windows Palette Editor.

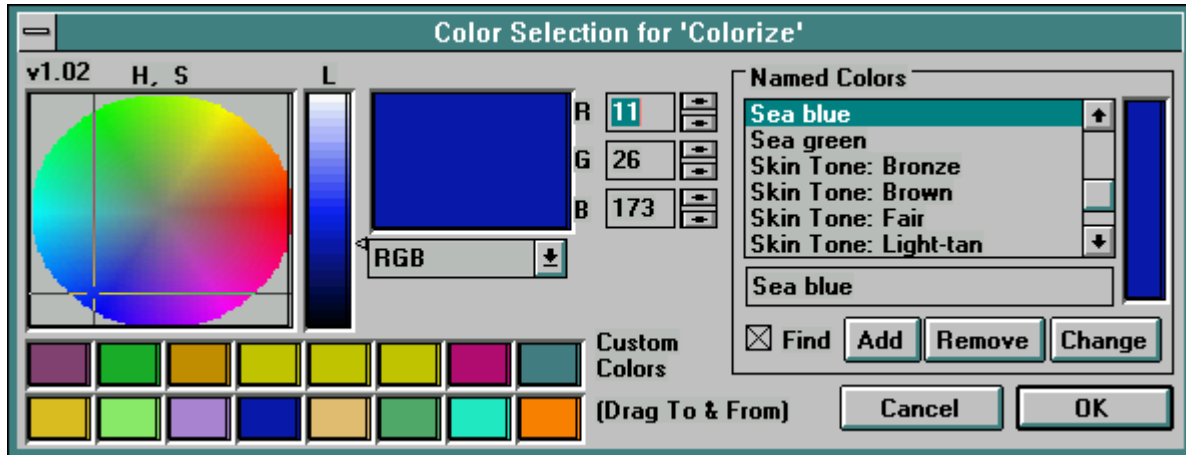
**Undo:** This selection will undo the last modification made to the palette. This allows you to apply an effect, and then undo the results if they are not to your liking. The undo is available for only the last operation that was performed. For example, if you do a Luma Sort and then a Hue Spread, only the Hue Spread can be undone. You can undo all operations except the changing of the "left color" settings. Pressing the Undo button a second time will give you back the modified palette.

**Close:** This will close the Palette dialog, and will allow you to use any modifications made to the palette. Remember, the last palette that is visible before closing will be used for the Use Loaded Palette render option. (See the Output Color Reduction dialog) Once the palette is closed, you can always reopen it by selecting the **Adjust Palette** button from the Output Color Reduction dialog.

#### **How to Create a Range of Colors:**

The creation of spreads of color is probably one of the most common tasks you will perform with morph's palette. The spreads can be used as backgrounds, and for other fill and text fill applications. This example will create a simple blue to red color spread, which could then be used as a render palette in morph. First, you will want to set the palette size to 256 colors by clicking on the size button, and then entering 256. If the palette is already 256 colors you may skip the previous step. Next, move the "left color" marker to position 0. This can be done by clicking with the left mouse button in the top left corner, or by entering a 0 in the position control. You will want to place the right color marker in position 255. This can be done by clicking the right mouse button on the final position in the palette (bottom right corner). Now, we will want to set the last color in the range. Since we want our range to go from blue to red, we will need to set the final color to red. This can be done in one of two ways. The first method is to select a red color using the Hue and Saturation color wheel. The documentation above describes how to select a color by this method. The second way of specifying a color is to enter the values using the provided RGB controls. Once you have a red hue in the color preview box, select the button marked **Copy**. This will place the current left color into the right color position. The next step is to set the blue color for the beginning of the range. You can use one of the two methods above to select a blue color. Once you have the blue color set, press the **Luma Spread** button. This will create a luminance based color spread between the specified blue and red. If you do not want to keep this spread, press the **Undo** button. All spreads (Hue and Luma) are created in this manner. You can create multiple color spreads by specifying multiple colors and performing spreads between each. Try applying a Hue Spread (and a Shifted Hue Spread) using the colors you have selected. Once you feel comfortable with that, try using some of the advanced tools like **Mirror**, **Repeat**, and **Merge**.

## The Color Selection Controls



*Click on any of the functions for quick help or look below for detailed documentation.*

The Color Selection Dialog is used to select colors for selected and non-selected lines and points. The dialog can be accessed by selecting the **Set Line Color** or **Set Selected Color** options in the **Display** pull down menu. The color selection dialog is divided into two sections. The first section deals with actual color selection, and contains a Hue and Saturation Color Wheel, a Luminance Bar, a color space selector, and manual color space entry fields. These controls can be used together to create a mind boggling array of colors and hues. The second portion of the dialog allows you to maintain a group of Custom Colors and a list of Named Colors. Each of these are described below in great detail. The dialog takes full use of Drag and Drop so that you can manipulate the colors quickly and efficiently. After the desired color is in the Color Preview box, press the **Ok** button to select the color for use. You can exit the dialog with out selecting a color by pressing the **Cancel** button.

### Related Topics:

[The Color Selection Dialog Controls:](#)

## The Color Selection Dialog Controls:

**Hue and Saturation Color Wheel:** The Hue and Saturation color wheel allows you to select a color's Hue and Saturation values. These values are then combined with the Luminance setting (the control to the right) to create a color. The Hue and Saturation "wheel" begins with red and then moves through yellow, green, cyan, blue, magenta, and then back to red. The color is "purest" (has the most saturation) at the edge of the wheel, and as you move in towards the center of the wheel the saturation drops. The center of the wheel contains a group of gray scale values. A color is selected by simply clicking, and holding the left mouse button on the color wheel. You can then move the mouse towards the desired color. The current color that the mouse is over will be displayed in the Color Preview Box to the right of the luminance control. Once you have the color you desire, or a lighter or darker version of the desired color, release the left mouse button. The "brightness" of the color can be altered using the Luminance control. For example, you have a Red color (R=225, G=25, B=32, and Luminance at about 50%), but it is not dark enough for the effect you are creating. So, you would adjust the Luminance to about 25%, and the new red will be much darker (R=102, G=15, and B=25). You do not need to use the color wheel and luminance bar to create or specify colors. You have the option of manually altering the RGB (or CMYK, HSL, etc.) values in the provided text entry fields. By doing this you can increment one or more of the components to a specific value. Remember, the final color in the preview will be the one used for the selected or non-selected lines.

**Luminance Control:** The Luminance control allows you to specify the brightness or luminosity of the color in the preview area. The Luminance is measured on a percentage scale from 0 to 100. A setting of zero will result in no luminance (black), and a setting of 100 will result in the maximum possible luminance (white). This is true regardless of the current selected color. For example, a red color can be made black by setting the Luminance control to 0 (bottom of the Luminance control), or it could be made white by setting the control to 100 (top of the Luminance control). A setting in the middle of the control (50%) will produce colors which are completely saturated or "pure colors". The luminance is set by simply clicking, and holding, the left mouse button over the luminance control. As you move the mouse, you should see the color in the preview increase or decrease in brightness as you move the mouse up and down the control. The preview will reflect all changes that you make to the luminance as they are made. When you have the desired color, release the left mouse button. It is important to remember that the final color in the preview will be the color used for the selected or non-selected lines.

**Color Preview Box:** The preview box contains the currently selected preview color. This color can be specified using the Hue and Saturation color wheel, or the RGB entry fields to the right of the preview. Any changes made to the color wheel, luminance control, or the RGB entry fields will be directly reflected in the preview color. This color can then be copied to the Custom Colors set by clicking on it, and then dragging it to the desired Custom Color cell.

**Color Spaces:** This drop down box contains a wide variety of colors spaces commonly used in graphics, desktop publishing, desktop video, and NTSC video. The color spaces include RGB (red, green, blue), CMY (cyan, magenta, yellow), CMYK (cyan, magenta, yellow, black), HSL (hue, saturation, luminance), HSV (hue, saturation, value), and YIQ (luminance, chrominance). The default color space is RGB, but can be changed at any time by accessing this dialog, and double clicking on the desired color space. Once the new color space has been selected, all of the values will be recalculated to reflect the differences between the spaces. It is important to remember that morph is dealing with pure colors, **not** real colors. This allows for conversion from color space to color space without altering the current preview color. The color space's letter equivalents will be placed in front of the appropriate dialog, and

can be altered as described below.

**RGB (or CMYK, CMY, HSV, HSL, YIQ):** The RGB controls allow you to enter specific Red, Green, and Blue values for the current preview color. Each of these components has two methods of entering the desired color values. The first is to simply manually enter the exact numeric values. This will alter the preview color as the value is changed. The second method is to use the up down gadgets located to the left of each text entry field. These allow you to increase or decrease the desired color component by clicking on the appropriate gadget (up for a value increase and down for a value decrease). You should notice that there are multiple color spaces available to you. You can alter the change the current color space by following the procedure described in the above section.

**Custom Colors:** Morph has a total of 16 available custom colors. These custom colors can be placed into the Custom Color cells using the **Drag and Drop** method. This means that you simply have to click on the Preview Color or on the Named Color Preview, and then drag the paint can icon to one of the custom color cells. This also works for specifying a preview color using one of the Custom Colors. To do this grab the desired custom color by clicking on it, and then drag it to the preview color box. If you drag one of the custom colors to the named color preview, morph will select the named color that is closest to the custom color selected. Custom colors allow you to maintain a group of visible colors for quick color selection. These colors will be saved and available for use the next time you open the Color Selection dialog.

**Named Colors:** The Named Colors section of the Color Selection dialog allows you to give names to specific RGB values. For example, the default named colors file (colorset.ini) contains such colors as Cobalt Blue and Carnation Pink. These two colors have specific RGB values, but also have a name associated with them. The controls in this portion of the dialog can be used to add additional colors and names to the colorset.ini file, remove colors from the file, or replace existing colors with new RGB values or names. A named color is placed into the preview color box by simply selecting the desired named color, and then clicking on the named color preview color box to the right of the list. This will automatically place the named color into the preview color box, and will adjust the RGB values accordingly. The intent of the named colors are to allow you to specifically name colors that you use frequently. This means that you no longer have to remember an obscure RGB value, but can instead remember a name which describes the color in question.

All of the Named Colors are kept in a ASCII text file called **colorset.ini** located in your Windows directory. You can use any Text Editor to add new named colors to the file. You may find this method to be faster if you are entering multiple colors and names. The instructions at the top of the file describe the method for adding new colors to the list. Once you have added the desired colors and names save the file and exit the text editor. The next time that you open the palette the new named colors will be available. This is **not** the only method of adding colors to the named colors list. Named colors can be added to the list in both the palette and color selector by pressing the **Add** button. Its use is described below in the **Add** documentation.

**Find:** The Find control, when selected, will force morph to find the color in the named colors list that is **closest** to the current color in the Preview Color box. For example, if you were selecting a color with the Hue and Saturation color wheel, you would see the current named color shift from name to name (color to color) as you move the mouse pointer over the color wheel. Remember, this is the closest color in the named color list. The current preview color can be added to the named color list by entering a new name, and then pressing the **Add** button. This will add the color to the list with the specified name and color space values (RGB, CMYK, HSL, etc.). If the find control is not selected, the current name color will only change when a new color is specified or selected using the provided list requester.

**Add:** The Add control is used to add new colors to the named colors list. New colors are added to the list by selecting the desired color, entering a name for the color, and then pressing the Add button. The color can be selected with the Hue and Saturation color wheel, or by the manual RGB numeric entry fields to the right of the color wheel. After the color is set, enter an appropriate name for the color. Morph will place the color directly above the currently highlighted named color. Morph will not automatically alphabetize the new named color entry. If you would like the list to remain alphabetical, you will need to manually select the appropriate location for the new named color. After you have the color set, named, and ready to go into the desired position in the list, press the Add button. This will automatically place the new name and color into the list, and make it the current named color. Remember, clicking on the named color preview box (to the right of the name list) will place the color in the color preview box as well as alter the RGB values to their appropriate settings.

**Remove:** This control is used to remove colors which are no longer needed. The remove control works by simply selecting the color to remove, and then pressing the Remove button. Once a color is removed from the list it will not appear again unless the color is re-added at a latter time. The remove feature can also be used to remove newly added colors that are in the wrong position in the list. You also have the option of Changing the color instead of removing it.

**Change:** The Change control is used to change the name or RGB values of the currently selected named color. You have the option to change the name, the color, or both. The first step in changing a named color is to select the color to be changed. If you are going to change the name, but not the color, you must first click on the named color preview color box to the right of the names list. This will place the current named color into the color preview. Next, enter the change to be made to the name, and press the Change button. This will replace the old name with the new name, but will not alter the actual color. If you would like to change only the color, do not click on the named color preview color. Instead, alter the color using the Hue and Saturation color wheel, or the manual RGB entry fields. After you have the desired color in the color preview, press the Change button. You can follow the same procedures to change the name and color. The only difference is that after setting the color you will also need to alter the name. Once that is complete, you can select the Change button to alter the color and color name. The changes made to the named colors list will be saved colorset.ini file when the color selection dialog is closed.

# Tutorials

The Tutorials section of the manual is intended to give you a brief overview and "hands-on" experience with some of the various morphing methods and tools found in WinImages:morph. All of the tutorials will use images from the original WinImages:morph disks. These images are provided with the original diskettes, and should be in the directory called **Images**. Each tutorial will show you one method of using morph and its controls. This should not be taken as the only way to use the tool or the program. Instead, the tutorials should be viewed as a leaping off point for your own new and imaginative use of all of the operations in this program.

The tutorials are arranged in groups based on complexity. The tutorials start with a section on morphing basics, and end with a motion morphing section. It is also important to remember that the definitions of all of the controls can be found in the individual sections on the various tool. A basic understanding of an operation or tool's purpose, and method of control, can be ascertained from reading these sections. It is strongly suggested that you first look at the main documentation before beginning any of tutorials.

## Related Topics:

[Morphing Basics - The User Interface](#)

[Morphing Basics - Warp Morphing](#)

[Warp Morphing - Nuts and Bolts](#)

[Warp Morphing - Frames, Points, and Links](#)

[More on Warp Morphing - Warp Motion Morphing](#)

[Transition Morphing - The Basics](#)

[Transition Morphing - Nuts and Bolts](#)

[Transition Morphing - Frames, Points, and Links](#)

[Transition Morphing - Motion Transition Morphing](#)

## Morphing Basics - The User Interface



**Morphing:** the word conjures up pictures in the mind of something normal-looking twisting and turning, features running like wax and through some film-maker's voodoo, finally turning into... something else, maybe normal looking, but maybe not. WinImages:morph can do every bit of that; and do it well, too.

The process is not really very complex, either. The following section contains everything you need to understand how to use WinImages:morph to create outstanding looking morphs, including two carefully constructed tutorials.

We'll begin with a concise description of what we mean by morphing in a technical sense, followed by an overview of the controls in morph, and then go immediately into a pair of tutorials designed to get you going quickly.

Once you've been through the tutorials and have a basic understanding of how the morphing works, you can begin exploring all of the extra-special morphing techniques and tools available!

### What Morphing Means:

The concept of "morphing images" has two meanings in Morph:

- 1** - Distorting a single image into a new image using positional control information supplied by the user. This is commonly known as warping an image, or **warp morphing**.
- 2** - Combining distortions of two images to form a new image, using color information from both source images, along with positional control information supplied by the user. This is known as **transition morphing**.

Morphing can also be taken generally to mean the generation of a sequence of images using either method 1 or 2 as just discussed, instead of just a single image. Such a sequence provides a continuous (or as nearly so as possible) change from one image to the other when these images are played back in

real time as in a video or a movie. If a sequence of images is desired as morph output, then the user can supply a second control element, timing, in addition to the positional controls.

One further extension of these ideas is that of Motion Morphing. The idea here is to create a series of morphs from a varying sequence of input images. An example of this would be two sets of 30 frames of two different people walking down a street, where the desired effect is to have one person change into the other during the (moving) 30 frames. This requires that you provide the two complete sets of images to be used as input to the morphing tools and then specify the control information that is needed to control the morph in a realistic manner. This is perhaps the type of morph with the greatest complexity. It requires the most from the user in terms of setting up the input images for the best results, and then specifying the proper control information to the software. Motion morphing is not suggested for new users of Morph.

The morphing capability implemented in WinImages:morph provides the tools to generate individual frames as needed, or a sequence of frames to your specifications using either of the two basic methods. Series of frames may be generated from either static (non-moving) images, or from sequences of pairs of images as motion morphs.

When using WinImages:morph to generate morphs from static images, you have excellent control over the three most important factors in the process:

**Geometry** - Localized positional changes of the image surface

**Velocity** - Rate of change of each localized positional change

**Colorimetry** - Transparency changes between two images

When using WinImages:morph to generate motion morphs, in addition to the above three elements of the morph, you also have control over the following additional issue:

**Tweening** - Automatic generation of control information for frames in which you have not specifically defined controls.

As mentioned previously, there are two kinds of morphing available in WinImages:morph - single image (warp) morphing and dual image morphing. It is suggested that you begin with the Warp Morphing Tutorial, and then look at the Compose Morphing Tutorial.

## The Tools:

There are four separate groups of tools and controls in WinImages:morph. Each of these groups contributes to creating morphed images and sequences. These groups are: The Pull Down Menus, The Icon Tool Bar, The Tool Box, and The Filmstrip. Each of the four tools are described below.

**The Pull Down Menus:** The Pull Down Menus contain many settings and controls used for file manipulation, point control, morphed animation creation, the filmstrip, and the display. Clicking on any of the menu titles will access the contents of that menu. Each of these menus, and their contents, are discussed in further detail in the sections on pull down menus. The Pull Down Menus are:

**File:** The File menu is used for all loading and saving of single images. This panel also contains controls for specifying the Output Color Reduction (image output palette), and project loading and saving. All output sequences are controlled through the **Sequence Controls** panel in the **Generate** menu.

**Points:** The Points menu allows you to load, save, and delete the current point set. It is important to remember that selecting the **Delete points...** option from the Points menu will delete all of the current points. These points can be retrieved unless the point set is saved prior to being deleted.

**Generate:** The Generate menu contains options for generating the output of a sequence of morphed

frames. The **Sequence Controls** option allows you to specify the output file type, name, resolution, and the total number of frames. This menu also offers two methods of generating morphed output - As a sequence of frames or as a single output image. The Generate menu also contains all of the controls for setting up and creating **Motion Morphs**.

**Display:** This menu contains options for setting the display characteristics for the program, images, and objects. Morph will automatically detect the best display mode for your system. It is possible to change this to another display mode, but this is generally not necessary. You can also alter the display color of selected and unselected objects in the display panel. Once you have selected the object color to modify, morph will automatically present you with the **Color Selection Dialog**. You can then select the desired color using the provided color selection tools. ([Press Here](#) to view more information on the color selection dialog.)

**Settings** This menu allows you to specify the type of morph, and any special Transparency or Velocity Curves for your morphing sequence. The morph type refers to the **Warp Morph** and **Transition Morph** options in this menu. These two selections will set the default transparency curve that is used. If Transition Morph is selected, then a default ramped transparency curve will be used. If Warp Morph is selected, then no transparency curve will be applied. The Velocity and Transparency options allow you to edit existing curves, or create new curves for the transparency and velocity of a morph. These curves can then be applied to various objects (lines, points, and links). You can even assign a specific velocity or transparency curve for an entire level in the morph.

**Filmstrip** The Filmstrip menu contains several options related to sizing, loading, and saving filmstrips. Each of these options is discussed in greater detail in the [Filmstrip](#) documentation section. It is important to remember that morph sequences should generally be saved in the desired animation format using the Sequence Controls' **Save Result** option. Saving a filmstrip as an animation format requires more memory and time than simply saving the frames as they are generated.

**Help.** This option will access the WinImages:morph help documentation. There are several options for accessing different manual sections and tutorials. You can access specific help for the icon tool bar and dialogs by placing the cursor over the item you wish to view help on, and then press the F1 key. This will automatically open the manual to the correct section. In some cases it will be necessary to scroll down the page to find the desired information.

**See Also:** [Pull Down Menus](#)

**The Icon Tool Bar:** The Icon Tool Bar contains many of the tools needed to manipulate points, lines, and links. The icons available are:

**Delete:** The Delete icon allows you to delete the currently selected point, line, or object. The current object will appear as a different color from all other objects. This color can be set using the **Set Selected Color...** option in the **Display** menu. You can change the current object by pressing the left or right cursor keys. Once the object to be deleted is selected, press this button or the Delete key to delete the object. It is important to remember that once an object has been deleted it can not be retrieved. If you accidentally delete an object from a saved points file, simply reload the points file, and replace the current point set.

**Link:** A Link is used to connect control objects in a morph. Links differ from Lines and Points in that the link is not a "hard" control element. This means that a line or a point will not allow image information to move beyond the point or line. Links, on the other hand, will allow image information to move beyond their position. Thus, links should mainly be used to connect Lines and points, and not to define specific

control. The Links button is an On/Off state button. This means that links can only be placed when the button is in the On position, and you can stop placing links by clicking the Links button again.

**Point Curve:** Sets the velocity or transparency curve assignment for the currently selected point or line. It is important to remember that this is the only way to specify a transparency or velocity curve for a control line. You can not specify separate transparency or velocity information for the same line. For example, you can not specify the top half of a line as an **early** transparency curve, and the bottom half as a **late** transparency curve. The entire line must be either the late or the early transparency setting.

**Group Curve:** After clicking this button, the program will ask for either Velocity or Transparency to be set. Draw a rectangle on either the start or end images. The program will then present a list of velocity or transparency curves. All points that lie within the rectangle you drew will be assigned to the selected curve. All points which are assigned to this curve will be redrawn with a red outline. Note: You can not use this option to specify a transparency or velocity curve for a control line or curve. Velocity and transparency information can be set for lines and curves through the **Point Curve** option.

**Bound Curve:** After clicking this button, the program will ask for either Velocity or Transparency to be set. Draw an arbitrary shape on either the start or end images. The program will then present a list of velocity or transparency curves. All points that lie within the shape you drew will be assigned to the selected curve. All points which are assigned to this curve will be redrawn with a red outline. Note: You can not use this option to specify a transparency or velocity curve for a control line or curve. Velocity and transparency information can be set for lines and curves through the **Point Curve** option.

**Set Layer:** The Layer button in the tool bar allows you to specify control objects into layers of control. You may be wondering what a layer even is, and how it can benefit your morph sequence. Layers and layering allow you to separate various objects from the rest of the morph, and morph them independent of objects not in the same layer. For example, the Bounce motion morph project uses two layers. The first layer (also known as the Base Layer) contains no control objects, and is essentially the background of the motion morph frames. The second layer contains 1 object (the circle and square outlines), which is placed above the background. When the morph is generated, the base layer is created first, and then any subsequent layers that have been specified. In this case there is only one other layer, so it is created and placed on top of the base layer. The overall effect is the ball morphing into the square without ever altering the background information. In previous releases of the software, this functionality was not available. Users had to specify more control points and lines to keep the background from moving. Layering eliminates the need for these "holding points".

**Animate:** This displays the film strip if it is not already displayed and starts it animating. Clicking on the button again will stop the animation.

**Zoom/Negative Zoom:** The Zoom/Negative Zoom button is broken into two sections. The top right section of the icon allows you to access the zoom tool, and the bottom left side of the icon allows you to access the negative zoom tool. After pressing the Zoom button, morph will alter the cursor to look like a magnifying glass. You can then draw a rectangle on either the Start, End, or Result images. The area inside the rectangle will be zoomed to fill the entire window. If you simply click in the view window, morph will do a 2X zoom with the center of the zoom being where you initially clicked.

## Morphing Basics - Warp Morphing

The simplest way to familiarize yourself with WinImages:morph (and morphing in general), is to simply start creating morphs. We will begin this tutorial with the simplest type of morphing: warp morphing or warping. This type of morphing uses a single image with two distinct sets of points or objects. These points or objects are set around features in the Start image, and the exaggerated or moved in the End image to create a "warped" effect. Warp morphing is the least complex of the various morphing operations, and working with it will provide a good general understanding of the basic tools available for all types of morphing within the application.

The first step in creating a warp morph is to load the image that you wish to morph. This can be accomplished by accessing the File menu's **Load Start Frame...** option. For this example you will want to load the **firegirl.trm** image file located in your C:\Images directory. Morph will automatically identify the image file type, and load the image into the Start Image View Window. We will now need to place the same image in the End image view so that we have both a start and end image. This can be done by selecting the File menu's **Load End Frame...** option, or by selecting the **Distortion Morph** option from the Settings menu. The latter method will simply *clone* the existing start image into the end image view window.

The WinImages:morph interface consists of five separate control elements: Pull Down Menus, the Tool Bar, the Object Tool Box, the Image Views, and the Filmstrip. Each of these areas of the program were explained in the last tutorial section. (Note: This tutorial will assume that you have read the information in the previous tutorial section.) Each of these control elements are used to create a morph. In the morph program window, you should see two view windows with the firegirl image in both, the filmstrip, and the object Tool Box.

We will begin by specifying a series of points on and around the left eye of the girl in the Start image. This is done by first selecting the point tool from the Object Tool Box, and then clicking with the left mouse button where you would like the control points to appear. The control points specify areas of the image that you would like to "focus" control on. This point also has a corresponding point in the End Image. Start specifying points by left clicking while the pointer is over center of the girl's eye. You should see a small red cross appear where you clicked (this color can vary based on your display settings). Now, look in the End image; you should see a control point in that image in exactly the same location on the End image.

Now, use the right mouse button to click on and drag the end control point in the End Image somewhat off-center (if you're using the face that we suggested, drag it to the right of the eye about the width of the eye). What you have done is told WinImages:morph that the part of the image identified by that control point on the start image (the starting point) is to be moved, or distorted, to the location indicated by the ending control point.

Let's take a look and see what kind of results you get from this single control point. In this case we will want to generate only one frame. This can be accomplished by entering the Sequence Controls dialog to specify the frame we want generated, and the resolution that it should appear as. The Sequence Controls dialog is located in the Generate menu. This dialog contains a number of controls that affect the output frames of a morph sequence. For this example, we will want to set the **Total Frames** control to 15, and the **Current Frame #** option to 15 as well. This tells morph that we would like to move the points and objects from their start position to their end position over 15 frames. These settings also tell the program that when a single frame is to be generated, that we would like the final frame of the output.

There are several other controls for altering the morphing method, saving, output file type, and output size. All of these controls are documented in the section related to the Sequence Controls dialog. The final two controls that we will want to set are the Save Results control and the Output Size parameters. For this example morph, you will not want to save the results. This can be set by making sure that the **Save Results** check box is not selected. If this control is selected, then each output frame created by morph will be saved in the output file type specified in the middle section of the Sequence Controls dialog. The other option that we need to set is the Output Size or resolution. This size automatically defaults to 96x72 which is the filmstrip resolution. This is done so that preview morphs can be quickly generated, and then edited until a final result is ready for generation. In almost all cases you will want to increase this resolution for your final output frames. In this case we want to clearly see in the Result Image view the 15th frame. The low resolution settings (96x72) will not be clear enough to view the changes we made to the image. The resolution can be set to any custom width or height, or you may select the resolution based on the start or end image's resolution or aspect ratio. For this example, you will want to select the **Set to Start Frame Size**. This will cause F/x to generate the output in the same resolution as the start frame or image. In this case that resolution is 300x400 pixels. We have now completed setting up the output requirements for this first morphing test. Select the **Ok** button at the top of the dialog to confirm these changes. The next step in generating a single frame is to select the **Do one frame...** option from the Generate menu. This will tell morph that you would like to generate the current frame based on the current control points and objects.

As the morph frame is generated, a progress bar will indicate how far the morph operation has to go to completion. When the morph completes, the preview image will be drawn in the Result Image view. Depending on just how far you moved the end point, the morphed image may look slightly distorted or very distorted.

Now, add a second start point by clicking on the Start Image, and again move the corresponding end point. Put the new start point in the middle of the other (right) eye and drag the end point on End Image to the left of the eye, again by about the width of the eye. Let's see how this new control point effects the morph. The frame can be generated by selecting the **Do one frame...** option from Generate menu. Morph will now re-generate the preview frame.

You should be getting the idea now; many unique and interesting warp morphs can be specified using control points just the way we've been showing you. These same basic principles can be used with other control objects (lines & curves) to create more complex movements and distortions.

Usually, a large number of control points are used to completely specify the exact distortions required. These control points can easily be replaced with lines or curves of control. It is important to remember that the more points or lines you use, the better the resulting morph will be. For the best results, you would completely outline features you want to change (like the eyes) and then change the endpoints in the end view to represent the new form you want the image to take. The Start Image view contains the same image as the End Image view so you have a reference of just how far to go, or how much distortion you want.

We'll go through a quick example of this and in the process teach you how to use **links** and a few more of the morphing tools. First, you'll want to delete the two points you've already placed. To do this, enter the Objects pull down menu, and select the Delete Objects option. Morph will automatically delete all of the points on both the start and end images. (**Note:** In most cases, you will want to save your point set before deleting it.)

Next, since we're going to be doing a bit more exacting operation, let's zoom in on the area where we'll be

working, the left eye. To zoom, first click on the zoom button located in the top right-hand corner of morphs Tool Bar. You will notice that the normal morph pointer will change into the shape of a magnifying glass. You should now point the zoom pointer about 1/2 inch above and to the left of the left eye, click and hold the left mouse button and drag the mouse down and to the right. A box will appear; keep pulling until the box entirely encloses the eye (about 1/2 inch below and right) and then let go of the mouse button. The Box can be repositioned by pressing the right mouse button in addition to the left. **(Note:** The area could also be zoomed by left clicking the mouse with the cursor over the center of the area that you would like to zoom. This will cause morph to do a simple 2x zoom with the cursor position as the center.) The image will now be zoomed in. If the result is not to your liking, click on the dezoom button and the zoom will be turned off. Repeat these steps, beginning with re-selecting the zoom button, to get a better zoom around the end image eye. When you have both the start and end image eyes nicely centered in a zoomed images, continue.

The Tool Box control should still have the point tool selected. If it does not have the point tool selected, please select it at this time. Now, point at the start image and drop points all around the edge of the eye. About eight points should be fine. Looking at the end image, the same points should be visible; just leave them alone for the moment. When we do this, we place the points as follows; one at each corner of the eye; one directly above, and one directly below the pupil; and the final four, one at a time between the corners of the eye and the points by the pupil; The final placement looks somewhat like this:

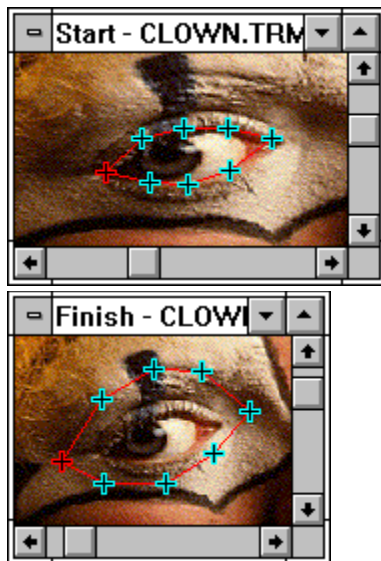


Now we're going to add links. Select the Links button located in the Icon Tool Bar. The icon looks like this. You should notice that when you click on this button, it looks as though it has been pressed down. In Morph this is known as a **state button**. A state button will remain in its current position or state until selected again. In most cases when the button is down, the option is on, and vice versa. Left clicking on the Links state button has turned on the linking in morph. Points (and other control objects) can be linked by simply left clicking on the point or object to be linked, and then left clicking on the next point or object to be linked. You can proceed in this fashion until all of the desired points or lines have been linked. It is important to note that you do not have to link control objects together, but linking can help you to better visualize how a morph will look and will give you greater control.

In the start image, beginning with any point you like, click on each point in turn all the way around the eye. As you go, you'll see blue links appear between each point. Continue until the eye is completely surrounded by links. When you get to the last point, click on it twice to de-select it. Looking over at the

end frame, you'll see the links are there as well.

Now, we will de-select the Links state button, so that we can move the points and links without creating new links. This can be done by left clicking on the Links button in the Tool Bar. This will turn the Linking mode off. We are now ready to move the points and links in the end image to create a warping effect. In the end image, move each of the points in turn away from the eye - we're going to make the eye swell up. This is done by right clicking on the desired point, moving the mouse to the new position, and then releasing the right mouse button. Morph will then place the point in the end image in the new location. Any links that are attached to the point will be automatically stretched to the proper length. Continue to move all of the points in the end image in this manner. Adjust each of the points in turn until the outline is about the same shape as the outline in the start image, but larger.



Let's see how these new control points and links effects the morph. The frame can be generated by selecting the **Do one frame...** option from Generate menu. Morph will now re-generate the preview frame. When the morph is complete, the result should look something like this:

When the preview completes, you should have a nice image of a face with an enlarged eyeball staring at you.

You may also find it beneficial to repeat this process using the Freehand or B-Spline tools to place a continuous line or spline around the eye, and then edit the end image line so that it is enlarged. (**Note:** It is not necessary to link lines in this case.) In this manner you can familiarize your self with all of the object tools available, and how they interact.

More complex morphs are usually made up of several regions such as the one you just created around the eye. As is the case with many things, even the most complex morph is the sum of a series of simpler operations.

### Have any Problems?

If you didn't get the results described here, we suggest you go back and go through the tour again. Most likely, you've missed a step somewhere.

## Warp Morphing - Nuts and Bolts

Now that you've seen the morphing tool in operation, let's briefly go over what you did from a more specific, technical point of view.

You placed **control points**. These actually consist of two elements, *start* and *end* points. These specify an exact amount of movement for the point of the image which is exactly under that particular control point. Areas of the image which are not directly underneath a control point move in such a way as to agree with all the control points nearby; the closer a control point is to a portion of the image, the more the image will move in a manner similar to the motion of that point. Control points which are very far away from a location on an image will have little or no effect on that location.

You also placed **links**. These are lines that go between two control points. They suggest to the software that no image information should *cross* the links; while control points alone may not exactly control an area, the combination of links and control points, or other control objects, can create almost any needed distorting motion that is reasonable.

We brought up an interesting issue in the last paragraph - what kinds of motions are reasonable and what kinds are not? It is a fact that the kinds of motion that can be specified with control objects and links is nearly infinite, but not all of them are reasonable. WinImages:morph has to attempt to keep the motions you specify for the image surface *connected*, so that portions of the image flow together in a natural manner. It is possible to specify motions that cause *tearing* or *folding* of the image, though, and normally this will not be what you want.

As you attempt more complex motions, you'll begin to encounter these situations. To solve them, you can either eliminate the offending motions or try to be more specific in those regions by adding more control objects and links.

Note that when we were discussing links earlier, we said they **suggest** control. This is because some types of edge combinations are impossible, such as where two links cross each other, and links in those situations will either be ignored or will cause image tearing and/or folding. A good rule of thumb is to have as few as possible crossing links in any morph you attempt to do.

## Warp Morphing - Frames, Points, and Links

### Warp Morphing and Frames:

When we speak of frames with regard to warp morphing, we are referring to the concept that many morphs are intended to be animated. Because of this, the morphs would be performed over a series of intermediate frames where the effect is slightly more apparent in each of the frames. For instance, when someone says they are creating a 15-frame warp morph, the idea they are conveying is that in frame 15, the effect of the morph is fully apparent. In frame 8, the middle frame, the effect would be 50% of the final result, and so on for each intermediate frame. When a sequence of frames are rendered, the "flow" of the surface of the image under control of the points and links is apparent as the frames are viewed in series.

When the object of the morph is a single final image and not a sequence of images, the convention is to assume that the desired image is the final image of a sequence (of any length). As an example, if Morph has been set for a 17-frame sequence, rendering frame 17 will provide a result with the effect 100% apparent. WinImages:morph allows you to choose a frame from anywhere within the currently set sequence length when you render a single frame instead of a sequence of frames. Simply remember that when you are creating a single warped image you should set the frame to be rendered to be the same as the length of the sequence. This is done by selecting the Do 1 Frame option in the Generate menu.

### Points:

Control points are used to define the flow of the image surface over the frames of a morph; when the object is one single warped image instead of a sequence, you should still think of the control points this way - it's just that you're only interested in the last frame of the sequence. The start point defines the portion of the image that will be moved, and the end point defines the location for that portion of the image for the final frame of the morph.

Control points can be thought of in two ways. First, and most conveniently, as a series of pairs of points (or lines), just as you see them in the main dual-window interface. Secondly, you can consider the two points as the endpoints of a path, over which the image must "flow" to accomplish the changes you are specifying with the points.

Placement of points should be done such that they are deposited at all key corresponding locations on the image surface. If we take the case of a face as an example, the corners of the eyes and mouth are obvious candidates. In addition, placement of points regularly along the edge of the profile will help control the image more exactly.

Points are never discarded by WinImages:morph's morphing procedures, even if they are defined in a conflicting manner. For this reason, you need to be careful that you do not place your points in such a way as to cause a conflict - one example of this is when the paths of two points cross each other during the course of a morph. This, and similar situations, will create folding and/or tearing in the image.

Points cannot completely restrain an image, because they only exactly control the portion of the image

directly underneath where they are placed. Areas of the image which are not directly underneath a point (or an edge) are adjusted according to the motions of the points which are nearest. Even points which are quite far away may add motion to an otherwise uncontrolled region. When a portion of an image needs more exact control, you should use points in conjunction with links, described next.

### **Links:**

Links are similar to points in that they specify movement for the surface of the image. They differ in that they control a much larger region, the entire area exactly under the line.

Links also differ in that WinImages:morph's morphing procedures may discard an edge under certain circumstances, such as when two links are defined that cross each other. When creating links, you should take care to ensure that you do not create a situation like this, as the results are undefined and will result in the image tearing or folding.

Placement of links should generally be done along lines in the image such as the links of eyes or a profile. They will restrict the motion of the image surface such that it will not transfer image data across the line, retaining colors precisely within the regions which are bounded by links. Most high-quality morphs will use almost as many links as they do points/lines.

### **Lines and Curves:**

Lines and Curves are used to specify continuous regions of control and movement. The lines can be thought of as a nearly infinite amount of points along the specified line. This means that sections of a line can have different velocities and transparencies. Lines and curves are a quick and easy method of specifying control and movement in a morph, and in some cases, are easier to use than points and links. However, this does not mean that lines will produce superior quality over points and links. As with links, you will want to avoid crossing lines. Lines that cross will cause image folds or tearing.

### **Morphing Time:**

The time it takes Morph to generate morph output frames is based almost entirely upon the size of the output images in the sequence. Anti-aliasing also adds a certain amount of time to the generation of each frame, again directly proportional to the size of the output image. A small amount of additional time is needed to compute frames that contain custom point-velocity computations. The size of the input images has no effect (and they may even be different resolutions, also with no effect on time); WinImages always scales images as needed during operations.

## More on Warp Morphing - Warp Motion Morphing

**To perform a motion warp morph, Morph requires that you...**

1. Completely specify the single stream of images which are to be contained in that warp morph...
2. Set up the points for two (or more) key frames, and optionally...
3. Specify the transparency, and velocity controls. Morph will then be able to generate a full-motion morph for you in an automated fashion.

When you begin, there are two options;

- Load a project file (Load Project under the File menu), created from a previous session with the motion morph operations, or...
- Select the Motion Morph option in the Generate pull down menu to start a new project.

If this is a new project, specify the number of frames in the project (Sequence Controls dialog); then choose the Start Frames using the menu option provided for that purpose (Generate Menu). Next, select the Distortion Morph option from the Settings menu. This tells the program that you will be creating a Warp Motion Morph.

Now, you'll be setting up the images and the control points/lines for the start frames. You can begin by specifying frame one of the sequence as the current frame. This is done by selecting the Sequence Controls option in the Generate menu, and then changing the current frame value to 1. This will cause F/x to load the first frame in the Start Frames list. Now, specify the desired points and the start and end image (they should be the same picture). You will want to outline the features that you want to warp or twist. This is done for a number of frames in the sequence so that the software knows where the points should be interpolated to. After you have specified the first frame's points, save the point set by selecting the Save Object option in the Objects menu. You will be asked to specify a specific directory path and name for the object file. After this is done, enter the Sequence Controls dialog, and select the last frame in the sequence as the current frame. For example, if you specified 30 frames as the start image, then the final frame value would be 30. Morph will now automatically update the start and end image view to reflect the change in frame number. Using the existing points, manipulate the points and lines to the new feature positions. (WARNING: Do not add new points or lines. This can cause problems when the software attempts to interpolate the points to their new positions.) After you have adjusted and warped the control objects to your liking, save the objects using the method above under a related file name. This process can now be carried out for any or all of the intermediate frames (remember more point sets = more control). You must have at least the first and last frame point set before you can generate the morph.

Now that you have the point sets for the frames, you need to tell Morph how to use the points. This is done by selecting the Generate menu's Specify Motion Point Files option. This will present you with a

dialog that is similar to the start image dialog. The only difference is that you will be specifying object files instead of images, and you have the option to tween or skip a frame. On the right hand side of the dialog you will see a text line that reads: At 1 have 0 need 30. This status line tells you the current position of the frame value, how frames you have specified, and how many frames need to be specified. In the example above the highlight bar is at the frame one position, no object files have been specified, and there are a total of 30 frames to specify. You should also notice that there are buttons to specify a new entry, remove an entry, skip a frame value or tween a frame value. For example if we were to have load the bounce project we would see a Object list that looks like this:

Notice that there only a total of four object files, and all other frames are a tween or skip frame. If a frame contains a object file, then that frame will use the specified points. If a frame contains a tween listing, then the software will tween the last set of points to a new position based on the next set of points and how many frames are between them. For example, in the bounce project the first frame is specified by an object file, and then frame 2, 3, and 4 are tweened to frame five which contains a pint set. This sequence of instructions tells morph to use the first set of points for frame one, and then interpolate for frames 2,3, and 4 from the original position in frame on to the new object position in frame 5. In this manner you can get a wide range of motion with a few sets of points. A Skip frame tells the software to use the last set of objects regardless of their status. This means that a Skip frame will use the last frames point information regardless if it is an object file or a tween frame. This can be used to show a slight pause in animation, or at the end of an animation to add an extra frame that uses the previous points (like the bounce example). After you have completed this, select the Ok button, and save the project from the file menu.

## **How motion morphs work:**

Motion morphs are controlled by a special project file. This file contains the names of all the images that are involved in the morph; as well as the names of any sets of points or lines that are defined (by you) for any of the frames. The minimum information in one of these files would be the names of all the frames, and the point file names for the starting and ending frames. Using this information, Morph can determine the likely positions for all frames for which you did not specify the control points in an exact manner. Note that the guesses which Morph makes for this are based upon the assumption that the motion is linear - that is, the morphing objects are moving in straight lines between the two nearest specified frames. You always need to determine if this is so; after a few tries, you should be able to tell quite easily if it is, or not.

One thing to be aware of is you need to be careful about changing any point file that is involved in a motion morph outside of the motion control panel; that can get things quite out of sync, and cause you problems later. This includes adding new control objects to a single point set. If you are going to add a new control object, it will have to be added to every point set that is specified.

## **Motion Controls - Details**

In order to work with a motion morph, you must switch on the Motion Morph option in the Generate menu. Until you do, the program will treat the morph like any other warp or transition morph.

Once on, the first thing to do is to tell Morph how many frames you are going to be working with by

entering a value in the "frames" text entry field in the Sequence Controls dialog. Then, select the set of "motion start" frames, and the set of "motion end" frames. This is done by using the Motion Start and Motion End Frames options in the Generate menu.

Now, you'll need to begin working with the start of frame. So, select the Sequence Controls option, and set the current frame value to 1. This will automatically set you to frame 1 and load the starting images. Exit the sequence controls panel, and set up the control information (points and lines) just as you would for a non-moving warp morph. Then, when the first frame has been prepared, save the point set with a distinct name that describes the project and the frame number. Now, enter the sequence controls dialog, and set the current frame value to the last frame in the sequence. This will automatically set you to the last frame in your sequence, and it will leave up the points for frame 1. Using the existing points, manipulate their position to the new locations and save the point set as described above.

You will now need to enter the Specify Motion Object Files option in the Generate menu. This dialog allows you to specify how each frame of the Motion Morph will receive its point information. In this case you would specify the first frame's object file in position one, a tween frame for all other frames, and the end frame object file for the last frame in the motion morph. After you have completed this, you can select the Sequence Generate option from the Generate menu. This is all you have to do for the most basic type of motion morph. All the intermediate frames will have sets of points that are created from the two sets you have currently defined. The process of creating the intermediate points is called *tweening*.

If the motion morph is not controlled accurately enough, then you'll want to go into a frame near the middle of your series and specifically place the points for that frame as well. Morph can now tween the frames from the start to the middle and then the middle to the end, which will be considerably more accurate.

You simply continue this process until the resulting morph is controlled well enough to suit you. You can have motion morphs with anything from just the start and end frames defined, to every frame defined - it's up to you.

## Transition Morphing - The Basics

Dual image morphing is also available in WinImages:morph. In order to create a transition morph, you will need to have two separate images loaded, one as the start frame and one as the end frame. To work through this tour with us, you'll need two images, each of a different face. They can be similar, like brothers, or they can be quite different, like a cow and a dog - just so they are faces viewed from the front. We will be using the girl and frog images that are supplied on the original installation diskettes. (**Note:** We are assuming that you have already worked through the warp morphing tour - if you have not, please go back and do that first.)

Once you've loaded two images of a face (or the girl and frog images), one as Start Image and one as End Image, you will be ready to begin Transition Morphing. Looking at the image display area, you will see two color image views, one of your start image and one of your end image. These two image views act like any other window - they can be re-sized and re-positioned to best suit your needs. These images are used to guide you in placing your control points, lines, and links.

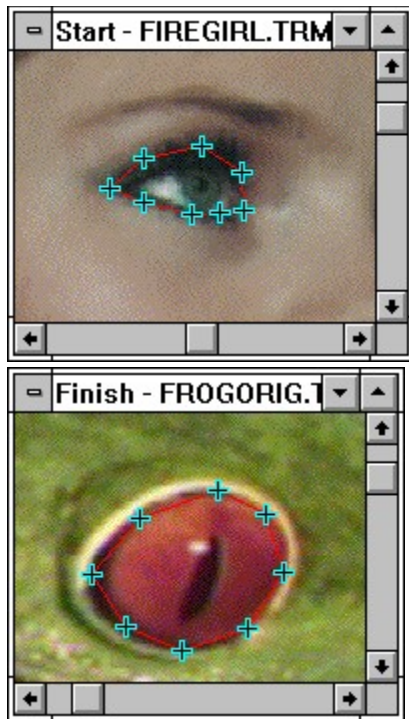
Begin by selecting the Sequence Controls option in the Generate menu. When the dialog opens, you'll see a text entry field marked **Total Frames**. If it does not read 15, then click in this field with your left mouse button and replace whatever was there with 15. Now press **Done**. For the best results when testing a dual image morph, you should always have an odd number of frames; this is so that there is a frame number that is exactly in the *middle* of the sequence. For instance, an 8-frame morph has frames 4 and 5, neither of which is in the middle; there is no middle frame.

Let's zoom in on the area where we'll be working, the left eye. To zoom, first click on the zoom button located in the top right-hand corner of the morphing panel. You will notice that the normal WinImages pointer will change into the shape of a magnifying glass. You should now point the zoom pointer about 1/2 inch above and to the left of the left eye (start image), click and hold the left mouse button and drag the mouse down and to the right. A box will appear; keep pulling until the box entirely encloses the eye (about 1/2 inch below and right) and then let go of the mouse button. The Box can be repositioned by pressing the right mouse button in addition to the left. The image will now be zoomed in. If the result is not to your liking, click on the dezoom button and the zoom will be turned off. Repeat these steps, beginning with re-selecting the zoom button, to get a better zoom around the eye. When you have the eye nicely centered in a zoomed image, continue.

Now, because you are working with two completely different images, the image in the right (end) view will need to be zoomed before we proceed. follow the steps from above to zoom around the left eye in the end image view.

Select the point tool from the tool box. Now, point at the start image's eye and drop points all around the edge of the eye, just as we did in the warp morph tour. And again, about 8 points should be just fine. When we do this, we place the points as follows; one at each corner of the eye; one directly above, and one directly below the pupil; and the final four, one at a time between the corners of the eye and the

points by the pupil; The final placement looks somewhat like this:

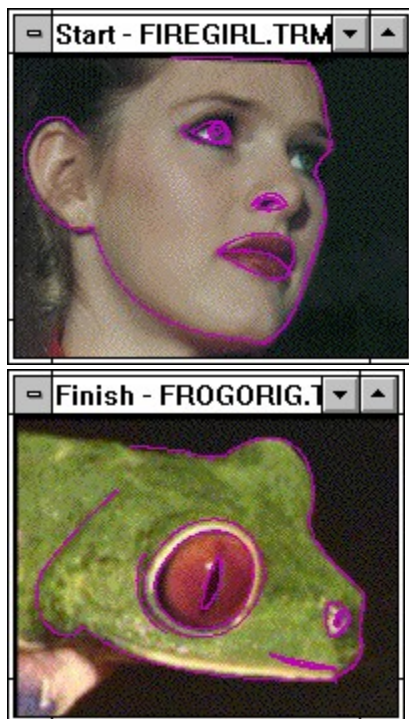


Looking at the end image, the same points will be visible, but they won't be correctly arranged around the end image's eye - that's because these are different eyes, unlike the warp morph, and Morph can't know exactly what you're trying to do. So, it's your job to get those points arranged in just the same manner around this other eye. It should be very obvious what needs to be done - the points should be in the same relative positions as they are in the left frame. You can point and move the points in the right frame now by right clicking on a point and then moving it into position. By the way, if you need to adjust any of the points in the start image view, right click on the desired point and move it to its new position. When you have the points arranged around both left eyes to your satisfaction, continue.

Now we're going to add links, again, just as we did for the warp morph tour. Click on the button in tool bar that reads Links. In the left image, beginning with any point you like, click on each point in turn all the way around the eye. As you go, you'll see colored links appear between each point. Continue until the eye is completely surrounded by links. When you get to the last point, click on it twice to de-select it. Looking over at the end frame, you'll see the links are there as well. Now, turn the linking tool off by clicking on its icon.

When you've got the entire group of points connected with links, click on the Negative Zoom button to turn off the zoom in each image view, and then click on the zoom button and zoom in a new area. This time, zoom the right eye of the start image. (**Note:** If you selected to do this tutorial with the girl and frog images, choose another feature to outline like the ear or mouth.) Now, simply repeat the process of adding points to the start image's eye, moving the points on the end image's eye to match up, and then

adding links. You should be familiar with the methods needed to do this; if you have problems, refer to the preceding paragraphs for more detail on what controls to select, and when. When you have the right eye set up, continue.



Enter the Sequence Controls dialog, and change the current frame value to 8. Now in the Generate menu, select the Do 1 Frame option. Morph will now generate the morph using the information that you specified. When the preview completes, you should have an image of the two faces mixed together, with the eyes (or another feature) tied perfectly together. You'll note that the rest of the face(s) are not perfectly matched up; that's because you don't have control points specified for the various matching features. The more features you tie together, the better the overall morph will look.

More complex morphs are usually made up of several regions such as the ones you just created around the eyes. As is the case with many things, even the most complex morph is the sum of a series of simpler operations.

To continue learning, we suggest that you work to make the rest of the features match up. You may also want to try the above tutorial using the lines and curves instead of points and links. You should be able to get the morph completely matched just using the techniques we've gone over - have fun!

### **Have any Problems?**

If you didn't get the results described here, we suggest you go back and go through the tour again. Most likely, you've missed a step somewhere.

## Transition Morphing - Nuts and Bolts

Now that you've seen the morphing tool in operation, let's briefly go over what you did from a more specific, technical point of view.

You placed **control points**. These actually consist of two elements, *start* and *end* points. These specify an exact amount of movement for the point of the image which is exactly under that particular control point. Areas of the image which are not directly underneath a control point move in such a way as to agree with all the control points nearby; the closer a control point is to a portion of the image, the more the image will move in a manner similar to the motion of that point. Control points which are very far away from a location on an image will have little or no effect on that location.

You also placed **links**. These are lines that go between two control points. They suggest to the software that no image information should *cross* the links; while control points alone may not exactly control an area, the combination of links and control points can create almost any needed distorting motion that is reasonable.

We brought up an interesting issue in the last paragraph - what kinds of motions are reasonable and what kinds are not? It is a fact that the kinds of motion that can be specified with control points and links is nearly infinite, but not all of them are reasonable. WinImages:morph has to attempt to keep the motions you specify for the image surface *connected*, so that portions of the image flow together in a natural manner. It is possible to specify motions that cause *tearing* or *folding* of the image, though, and normally this will not be what you want.

As you attempt more complex motions, you'll begin to encounter these situations. To solve them, you can either eliminate the offending motions or try to be more specific in those regions by adding more control points and links.

Note that when we were discussing links earlier, we said they *suggest* control. This is because some types of edge combinations are impossible, such as where two links cross each other, and links in those situations will either be ignored or will cause image tearing and/or folding. Odd things also happen when the vectors specified by control points cross each other. A good rule of thumb is to have as few as possible crossing vectors or links in any morph you attempt to do.

## Transition Morphing - Frames, Points, and Links

When we speak of frames with regard to dual-image morphing, we are referring to the concept that many morphs are intended to be animated. Because of this, the morphs would be performed over a series of intermediate frames where the effect is slightly more complete in each of the frames. For instance, when someone says they are creating a 15-frame dual-image morph, the idea they are conveying is that in frame 15, the morph has fully converted from the starting image to the ending image. In frame 8, the middle frame, the effect would be a 50% mix of both frames, and so on for each intermediate frame. When a sequence of frames are rendered, the "flow" of the surfaces of the images under control of the points and links is apparent as the frames are viewed in series.

When the object of a dual-image morph is a single final image and not a sequence of images, the convention is to assume that the desired image is the middle image of a sequence (of any length). As an example, if Morph has been set for a 15-frame sequence, rendering frame 8 will provide a result with the mix of the two images most obvious.

Morph allows you to choose a frame from anywhere within the currently set sequence length when you render a single frame instead of a sequence of frames. Simply remember that when you are creating a single frame result of a dual-image morph you should set the frame to be rendered to be the middle of the length of the sequence. This is done in the Sequence Controls dialog.

### Points

Control points are used to define the flow of the image surface over the frames of a morph; when the object is one single image instead of a sequence, you should still think of the control points this way - it's just that you're only interested in the middle frame of the sequence. The start point defines the portion of the image that will be moved, and the end point defines the location for that portion of the image for the final frame of the morph. Control points can be thought of in two ways. First, and most conveniently, as a series of pairs of points, just as you see them in the main dual-window interface. Secondly, you can consider the two points as the endpoints of a path, over which the images must *flow* to accomplish the changes you are specifying with the points. You can actually see these paths in the Onion Skin view window.

Placement of points should be done such that they are deposited at all key corresponding locations on the two image's surfaces. If we take the case of a face as an example, the corners of the eyes and mouth are obvious candidates. In addition, placement of points regularly along the edge of the profile will help control the images more exactly.

Points are never discarded by WinImages' morphing procedures, even if they are defined in a conflicting manner. For this reason, you need to be careful that you do not place your points in such a way as to cause a conflict - one example of this is when the paths of two points cross each other during the course of a morph. This, and similar situations, will create folding and/or tearing in the image. Often you will find it easy to determine if such a condition exists by observing the paths defined by the endpoints in the Onion

Skin interface.

Points cannot completely restrain an image, because they only exactly control the portion of the images directly underneath where they are placed. Areas of the images which are not directly underneath a point (or an edge) are adjusted according to the motions of the points which are nearest. Even points which are quite far away may add motion to an otherwise uncontrolled region. When a portion of an image needs more exact control, you should use points in conjunction with links or lines/curves, described next.

## **Links**

Links are similar to points in that they specify movement for the surface of the image. They differ in that they control a much larger region, the entire area exactly under the line. Links also differ in that WinImages' morphing procedures may discard a link under certain circumstances, such as when two links are defined that cross each other. When creating links, you should take care to ensure that you do not create a situation like this, as the results are undefined and will result in the images tearing or folding.

Placement of links should generally be done along lines in the images such as the links of eyes or a profile. They will restrict the motion of the image's surface such that image data will not be transferred across the line, retaining colors precisely within the regions which are bounded by links. Most high-quality morphs will use almost as many links as they do points.

## **Lines**

Lines are used to specify continuous regions of control and movement. The lines can be thought of as a nearly infinite amount of points along the specified line. The number of points that actually make up a line can be altered through the Onion Skin view interface. Lines/Curves are a quick and easy method of specifying control and movement in a morph, and in some cases, are easier to use than points and links. However, this does not mean that lines will produce superior quality over points and links. As with links, you will want to avoid crossing lines. Lines that cross will cause image folds or tearing.

## **Morphing Time**

The time it takes Morph to generate morph output frames is based almost entirely upon the size of the output images in the sequence. Anti-aliasing also adds a certain amount of time to the generation of each frame, again directly proportional to the size of the output image. A small amount of additional time is needed to compute frames that contain custom point-velocity computations. The size of the input images has no effect (and they may even be different resolutions, also with no effect on time); Morph always scales images as needed during operations.

## Transition Morphing - Motion Transition Morphing

To perform a motion morph, WinImages requires that you...

1. Completely specify the two streams of images which are to be contained in that morph...
2. Set up the points for two (or more) key frames, and ...
3. Specify how the points will be applied to the sequence of frames.

**When you begin, there are two options;**

1. Load a project file, created from a previous session with the motion morph operations, or...
2. Select the "motion morph" option in the Generate menu.

If this is a new project, specify the number of frames in the project; then choose the Motion start frames, and the Motion end frames using the option provided for that in the Generate menu. Once you've done this, set the current frame value in the sequence controls dialog to 1, and select Done. Now, you'll be setting up the control points for the first frame. When you have these points set up to your satisfaction, select the Save Objects option from the Objects menu. Now, set the current frame value to the last frame in the sequence, and press the Done button. This will load the final images. Modify the existing points to the new positions, and save the objects under another name. **Do NOT add any new objects or points to the motion morph.** You must adjust the existing point set.

Now, this may be enough to completely run your motion morph, if the images are moving in a very straight line. If not, you'll also need to set up one or more intermediate frames to account for non-linear motion. If you need to do one or more frames, do so now.

This process can now be carried out for any or all of the intermediate frames (remember more point sets = more control). You must have at least the first and last frame point set before you can generate the morph.

Now that you have the point sets for the frames, you need to tell Morph how to use the points. This is done by selecting the Generate menu's Specify Motion Point Files option. This will present you with a dialog that is similar to the start image dialog. The only difference is that you will be specifying object files instead of images, and you have the option to tween or skip a frame. On the right hand side of the dialog you will see a text line that reads: At 1 have 0 need 30. This status line tells you the current position of the frame value, how frames you have specified, and how many frames need to be specified. In the example above the highlight bar is at the frame one position, no object files have been specified, and there are a total of 30 frames to specify. You should also notice that there are buttons to specify a new entry, remove an entry, skip a frame value or tween a frame value. For example if we were to have load the bounce project we would see a Object list that looks like this:

Notice that there only a total of four object files, and all other frames are a tween or skip frame. If a frame contains a object file, then that frame will use the specified points. If a frame contains a tween listing, then the software will tween the last set of points to a new position based on the next set of points and how many frames are between them. For example, in the bounce project the first frame is specified

by an object file, and then frame 2, 3, and 4 are tweened to frame five which contains a pint set. This sequence of instructions tells morph to use the first set of points for frame one, and then interpolate for frames 2,3, and 4 from the original position in frame one to the new object position in frame 5. In this manner you can get a wide range of motion with a few sets of points. A Skip frame tells the software to use the last set of objects regardless of their status. This means that a Skip frame will use the last frames point information regardless if it is an object file or a tween frame. This can be used to show a slight pause in animation, or at the end of an animation to add an extra frame that uses the previous points (like the bounce example). After you have completed this, select the Ok button, and save the project from the file menu.

### **How motion morphs work:**

Motion morphs are controlled by a special project file. This file contains the names of all the images that are involved in the morph; as well as the names of any sets of points or lines that are defined (by you) for any of the frames. The minimum information in one of these files would be the names of all the frames, and the point file names for the starting and ending frames. Using this information, Morph can determine the likely positions for all frames for which you did not specify the control points in an exact manner. Note that the guesses which Morph makes for this are based upon the assumption that the motion is linear - that is, the morphing objects are moving in straight lines between the two nearest specified frames. You always need to determine if this is so; after a few tries, you should be able to tell quite easily if it is, or not.

One thing to be aware of is you need to be careful about changing any point file that is involved in a motion morph outside of the motion control panel; that can get things quite out of sync, and cause you problems later. This includes adding new control objects to a single point set. If you are going to add a new control object, it will have to be added to every point set that is specified.

### **Motion Controls - Details**

In order to work with a motion morph, you must switch on the Motion Morph option in the Generate menu. Until you do, the program will treat the morph like any other warp or transition morph.

Once on, the first thing to do is to tell Morph how many frames you are going to be working with by entering a value in the "frames" text entry field in the Sequence Controls dialog. Then, select the set of "motion start" frames, and the set of "motion end" frames. This is done by using the Motion Start and Motion End Frames options in the Generate menu.

Now, you'll need to begin working with the start of frame. So, select the Sequence Controls option, and set the current frame value to 1. This will automatically set you to frame 1 and load the starting images. Exit the sequence controls panel, and set up the control information (points and lines) just as you would for a non-moving warp morph. Then, when the first frame has been prepared, save the point set with a distinct name that describes the project and the frame number. Now, enter the sequence controls dialog, and set the current frame value to the last frame in the sequence. This will automatically set you to the last frame in your sequence, and it will leave up the points for frame 1. Using the existing points, manipulate their position to the new locations and save the point set as described above.

You will now need to enter the Specify Motion Object Files option in the Generate menu. This dialog allows you to specify how each frame of the Motion Morph will receive its point information. In this case you would specify the first frame's object file in position one, a tween frame for all other frames, and the end frame object file for the last frame in the motion morph. After you have completed this, you can select the Sequence Generate option from the Generate menu. This is all you have to do for the most basic type of motion morph. All the intermediate frames will have sets of points that are created from the two sets you have currently defined. The process of creating the intermediate points is called *tweening*.

If the motion morph is not controlled accurately enough, then you'll want to go into a frame near the middle of your series and specifically place the points for that frame as well. Morph can now tween the frames from the start to the middle and then the middle to the end, which will be considerably more accurate.

You simply continue this process until the resulting morph is controlled well enough to suit you. You can have motion morphs with anything from just the start and end frames defined, to every frame defined - it's up to you.

## Help System Files

## Repeat

The Repeat option will repeat the range of colors currently between the left and right color markers. Morph will evaluate the colors that it finds, and will then repeat the entire range of colors inside the two markers.

## Swap

The Swap option will swap the current left and right color. Only the colors will be swapped. The left and right color markers will remain in the same position. Pressing Swap again will return the colors to their original position.

## Mirror

The Mirror operation will mirror the colors in between the current left and right color markers. The mirror will be a "reflection" of the range of colors based on the center position of the range.

## Copy

The Copy button will copy the current left color into the right color. This can be useful for specifying the right color for spreads and sorts. After you have copied the left color, you can then specify a new left color to be used for multiple color spreads.

## Merge

The Merge option is used to merge together two separate palettes. Morph will take two palette and merge them together by comparing the colors of both palettes, and selecting the colors which best represent both palettes. This tool is especially effective for creating render palettes for animations based on two separate palettes.

## Insert

The Insert option allows you to insert a palette of colors based on the position of the "left color" marker. This allows you to insert or append another palette into the current palette. If the palette which is being inserted is larger than the remaining space in the palette, the additional colors will be placed beyond the total number of visible colors. If you were to increase the total number of visible colors in the palette (increase the Size value), the colors that were inserted beyond the original palette will become visible. Morph will only use the number of colors specified in the Size control regardless of any colors that have been inserted beyond the visible palette.

## Luma Spread

The Luma Spread operation allows you to create a spread or range of colors between the current left and right colors based on their initial luminance. The luminance that morph uses is a measure of actual RGB brightness of the left and right colors.

## Luma Sort

The Luma Sort option allows you to sort all of the colors in the current palette by their luminance or brightness. Once this option is selected, morph will evaluate the palette and reorder the colors based on each color's RGB brightness value from dark to light.

## Hue Spread

The Hue Spread option will create a spread of colors between the current "left color" and "right color" using the hue values of those two colors. There are two methods of applying the Hue Spread. The first is to simply press the Hue Spread button. This will produce a spread of colors between the current left and right colors without cycling through the complete hue spectrum. This method can be thought of as a "shortest path" method. This means that morph will take the shortest Hue distance to reach the specified "right color". The second method requires you to press and hold the Shift key while pressing the Hue Spread button. This will cause the new range to go through all of the colors linearly to reach the specified "right color". This will effectively cycle through all of the hue value between the selected colors from red to magenta based on the initial "left color".

## Hue Sort

The Hue Sort control will sort all of the colors currently between the left and right colors. This sort will rearrange the colors according to their individual hue settings. This includes all greyscales and color values between the left and right color markers. The hue sort begins with red and then moves through yellow, green, cyan, blue, and ends with magenta.

## Close

The Close option will close the palette dialog. The last visible palette will be the one that is used for animation rendering.

## Undo

This selection will undo the last modification made to the palette. This allows you to apply an effect, and then undo the results if they are not to your liking. The undo is available for only the last operation that was performed.

## Save

This control will save the current palette. The palette will be saved with a .pal extension. Once a palette is saved it can be reloaded using the Load option.

## Load

This will load a previously saved palette. The current palette will be eliminated, and morph will automatically resize the palette to best fit the newly loaded palette. Morph's palette can load Microsoft Windows Paintbrush palettes, AVI (Video for Windows) palettes, Bitmap palettes, and IFF palettes. The palette can also load custom palettes that have been saved using the Save option.

## Change

The Change control is used to change the name or RGB values of the currently selected named color. You have the option to change the name, the color, or both. Please refer to the detailed documentation below for a description on changing named colors.

## Remove

This control is used to remove colors which are no longer needed. The remove control works by simply selecting the color to remove, and then pressing the Remove button. Once a color is removed from the list it will not appear again unless the color is re-added at a latter time.

## Add

The Add control is used to add new colors to the named colors list. New colors are added to the list by selecting the desired color, entering a name for the color, and then pressing the Add button. The color can be selected with the Hue and Saturation color wheel, or by the manual RGB numeric entry fields to the right of the color wheel. After the color is set, enter an appropriate name for the color, and then press the Add button.

## Named Colors

The Named Colors section of the palette dialog allows you to give names to specific RGB values. For example, the default named colors file (colorset.ini) contains such colors as Cobalt Blue and Carnation Pink. These two colors have specific RGB values, but also have a name associated with them. The controls in this portion of the dialog can be used to add additional colors and names to the colorset.ini file, remove colors from the file, or replace existing colors with new RGB values or names. The intent of the named colors are to allow you to specifically name colors that you use frequently. This means that you no longer have to remember an obscure RGB value, but can instead remember a name which describes the color in question.

## RGB

The RGB controls allow you to enter specific Red, Green, and Blue values for the current "left color". Each of these components has two methods of entering the desired color values. The first is to simply manually enter the exact numeric values. This will alter the preview and "left color" colors. The second method is to use the up down gadgets located to the left of each text entry field. These allow you to increase or decrease the desired color component by clicking on the appropriate gadget (up for a value increase and down for a value decrease). You should notice that there are multiple color spaces available to you. You can alter the change the current color space by following the procedure described in the color space control section.

## Position

The Position control displays the current "left color" position, and can be used to manipulate the position of the left color marker. The up and down arrows can be used to move the left color marker through the palette, or you can enter a value in the provided text entry field. If you specify a numeric value which is beyond the size of the current palette, morph will place the left color marker in the last available color cell.

## Preview

The preview box contains the currently selected "left color". This color can be specified using the Hue and Saturation color wheel, or the RGB entry fields to the right of the preview. Any changes made to the color wheel, luminance control, or the RGB entry fields will be directly reflected in the preview color and the "left color" in the palette itself. This color can then be copied to the "right color" position by selecting the Copy button.

## Size

The Size control is used to set the actual size or number of colors in the palette. This value can range between 2 and 1024 colors. If you increase or decrease the size of the current palette, either more cells will be added or some of the current cells will be eliminated. The cell size will decrease as the number of colors increase. This means that a palette of 1024 colors will have extremely small cells for the colors in the palette. If you are loading a palette which contains more colors than the current palette, morph will automatically increase the size of the palette to accommodate the new palette.

## Luminance Control

The Luminance control allows you to specify the brightness or luminosity of the color in the preview area. The Luminance is measured on a percentage scale from 0 to 100. A setting of zero will result in no luminance (black), and a setting of 100 will result in the maximum possible luminance (white). This is true regardless of the current selected color. The luminance is set by simply clicking, and holding, the left mouse button over the luminance control. As you move the mouse, you should see the color in the preview increase or decrease in brightness as you move the mouse up and down the control. The preview will reflect all changes that you make to the luminance as they are made. When you have the desired color, release the left mouse button.

## The Hue and Saturation Color Wheel

The Hue and Saturation color wheel allows you to select a color's Hue and Saturation values. These values are then combined with the Luminance setting (the control to the right) to create a color. The Hue and Saturation "wheel" begins with red and then moves through yellow, green, cyan, blue, magenta, and then back to red. The color is "purest" (has the most saturation) at the edge of the wheel, and as you move in towards the center of the wheel the saturation drops. The center of the wheel is a greyscale value. A color is selected by simply clicking, and holding the left mouse button on the color wheel. You can then move the mouse towards the desired color. The current color that the mouse is over will be displayed in the Color Preview Box to the right of the luminance control. Once you have the color you desire, or a lighter or darker version of the desired color, release the left mouse button.

## The Palette

WinImages:morph's palette control allows you to manipulate and alter existing palettes or create new palettes and ranges of color. The Palette controls include operations that will merge two palettes, insert a new palette, mirror the palette, and create various color spreads and sorts. This tool is particularly useful for loading a specific palette for an animation, thus keeping the original palette intact. Morph's palette can load Microsoft Windows Paintbrush palettes, AVI (Video for Windows) palettes, Bitmap palettes, and IFF palettes. Please refer to the detailed documentation below for more detailed information.

## Find

The Find control, when selected, will force morph to find the color in the named colors list that is closest to the current color in the Preview Color box. For example, if you were selecting a color with the Hue and Saturation color wheel, you would see the current named color shift from name to name (color to color) as you move the mouse pointer over the color wheel.

## Color Space

This drop down box contains a wide variety of colors spaces commonly used in graphics, desktop publishing, desktop video, and NTSC video. The color spaces include RGB (red, green, blue), CMY (cyan, magenta, yellow), CMYK (cyan, magenta, yellow, black), HSL (hue, saturation, luminance), HSV (hue, saturation, value), and YIQ (luminance, chrominance). The default color space is RGB, but can be changed at any time by accessing this dialog, and double clicking on the desired color space. Once the new color space has been selected, all of the values will be recalculated to reflect the differences between the spaces.

## Default Colors

This option, when selected, will render the image using a default set of colors. These colors are predetermined for both 16 and 256 color renders. A 16 color render will use the default Windows palette for rendering, and a 256 color render will use a preset palette designed at Black Belt Systems to produce high quality renders without any color selection. This method is the fastest render method, but also has the lowest quality.

## Edit Palette

The Edit Palette button will access morph's render palette. This palette can then be adjusted, altered, or a new palette can be loaded for use as the render palette. Once you have the desired palette, select the Close button to exit the palette. You can then use the Use Loaded Render Palette to generate a frame or sequence of frames which uses the current render palette as the output image palette. This is very useful for creating output files or animations that use the same exact palette for each file or frame.

## Confirm to Output Color Reduction

The Ok button will confirm the changes and close the Output Color Reduction dialog.

## Dither

The Dither Amount control is used to specify the percentage amount of dither in a render. This amount can range from 0 (no dither) to 100 (maximum dither). The dither amount can effect the amount of intraframe compression over the sequence. This can reduce the overall size of the animation frame.

## EDD

Error Diffusion Dither (or EDD) will dither the image based on the specific pixel colors, and the colors of neighboring pixels. This will generally produce the highest quality dithering in the image, with the best possible colors being represented by the dither. This is done at the expense of adding more "noise" to the image. This means that in some cases the dither is easier to perceive.

## Ordered Dither

Ordered Dither will dither the image based on the current pixel, and that pixel's location in the actual image. This type of dithering will generally produce a lower quality image, but is necessary for animation that will be using any type of compression. The ordered dither allows for a great deal of interframe compression, which is needed to compress animation files. This type of dithering should only be used for the output of animation files. If you want to produce higher quality output images (not animations), you should use the EDD dither method.

## Select Colors

This option will allow morph to use its custom color selection process to select the best colors possible for the output image. The Spectral Color Selection process will determine the output colors which best represent the colors in the actual image. This format is valid for both 16 and 256 color render modes.

## Use Current Palette

This option will use the range of colors which is currently loaded into the render palette. This range of colors can be specified manually or by loading a specific render palette file. The render operation will then use the colors in the effect palette as the render palette for the output files. This option is ideal for using a very specific palette for an output animation or sequence of files. Morph will only use the number of colors specified in the render palette. For example, if you were doing a 256 color Bitmap render with only 240 colors in the render palette, the rendered bitmap would only use the available 240 colors. The same is true for any number of colors. This means that it is possible to render a 256 color output with only 2 colors in the render palette. If you were to create a 16 color bitmap with 256 colors in the render palette, only the first 16 would be used.

## Use Gray Scale Palette

The Gray Scale Palette render option will render the output in either 16 or 256 gray levels. The gray scale palettes are predetermined which makes the gray scale render very fast.

## Hue and Saturation Control

The Hue and Saturation wheel allows you to select a color's Hue and Saturation values. These values are then combined with the Luminance setting (the control to the right) to create a color. The Hue and Saturation "wheel" begins with red and then moves through yellow, green, cyan, blue, magenta, and then back to red. The color is "purest" (has the most saturation) at the edge of the wheel, and as you move in towards the center of the wheel the saturation drops. The center of the wheel is a gray scale value. A color is selected by simply clicking, and holding the left mouse button on the color wheel. You can then move the mouse towards the desired color. The current color that the mouse is over will be displayed in the Color Preview Box to the right of the luminance control. Once you have the color you desire, or a lighter or darker version of the desired color, release the left mouse button.

## Luminance Control

The Luminance control allows you to specify the brightness or luminosity of the color in the preview area. The Luminance is measured on a percentage scale from 0 to 100. A setting of zero will result in no luminance (black), and a setting of 100 will result in the maximum possible luminance (white). This is true regardless of the current selected color. The luminance is set by simply clicking, and holding, the left mouse button over the luminance control. As you move the mouse, you should see the color in the preview increase or decrease in brightness as you move the mouse up and down the control. The preview will reflect all changes that you make to the luminance as they are made. When you have the desired color, release the left mouse button.

## Preview Color Box

The preview box contains the currently selected preview color. This color can be specified using the Hue and Saturation color wheel, or the RGB entry fields to the right of the preview. Any changes made to the color wheel, luminance control, or the RGB entry fields will be directly reflected in the preview color. The color that is this preview will be the color used for the current operation when the Ok button is selected.

## Color Space

This drop down box contains a wide variety of colors spaces commonly used in graphics, F/x has a total of 16 available custom colors. These custom colors can be placed into the Custom Color cells using the Drag and Drop method. This means that you simply have to click on the Preview Color or on the Named Color Preview, and then drag the paint can icon to one of the custom color cells. This also works for specifying a preview color using one of the Custom Colors. To do this grab the desired custom color by clicking on it, and then drag it to the preview color box. If you drag one of the custom colors to the named color preview, F/x will select the named color that is closest to the custom color selected. Custom colors allow you to maintain a group of visible colors for quick color selection. These colors will be saved and available for use the next time you open the Color Selection dialog.

## Named Colors

The Named Colors section of the palette dialog allows you to give names to specific RGB values. For example, the default named colors file (colorset.ini) contains such colors as Cobalt Blue and Carnation Pink. These two colors have specific RGB values, but also have a name associated with them. The controls in this portion of the dialog can be used to add additional colors and names to the colorset.ini file, remove colors from the file, or replace existing colors with new RGB values or names. The intent of the named colors are to allow you to specifically name colors that you use frequently. This means that you no longer have to remember an obscure RGB value, but can instead remember a name which describes the color in question.

## Find

The Find control, when selected, will force F/x to find the color in the named colors list that is closest to the current color in the Preview Color box. For example, if you were selecting a color with the Hue and Saturation color wheel, you would see the current named color shift from name to name (color to color) as you move the mouse pointer over the color wheel.

## Add

The Add control is used to add new colors to the named colors list. New colors are added to the list by selecting the desired color, entering a name for the color, and then pressing the Add button. The color can be selected with the Hue and Saturation color wheel, or by the manual RGB numeric entry fields to the right of the color wheel. After the color is set, enter an appropriate name for the color, and then press the Add button.

## Remove

This control is used to remove colors which are no longer needed. The remove control works by simply selecting the color to remove, and then pressing the Remove button. Once a color is removed from the list it will not appear again unless the color is re-added at a latter time.

## Change

The Change control is used to change the name or RGB values of the currently selected named color. You have the option to change the name, the color, or both. Please refer to the detailed documentation below for a description on changing named colors.

## Cancel Color Selection

The Cancel button will exit the Color Selection dialog without altering the previously selected color.

## Confirm Changes

Pressing the Ok button will select the current preview color, and close the Color Selection dialog. This color can then be used for the current selected or non-selected line color.

## RGB Control

The RGB controls allow you to enter specific Red, Green, and Blue values for the current preview color. Each of these components has two methods of entering the desired color values. The first is to simply manually enter the exact numeric values. This will alter the preview color as the values change. The second method is to use the up down gadgets located to the left of each text entry field. These allow you to increase or decrease the desired color component by clicking on the appropriate gadget (up for a value increase and down for a value decrease). You should notice that there are multiple color spaces available to you. You can alter the change the current color space by following the procedure described in the color space control section.

## Current Object

The Current Object display will show the number of the currently selected object. An object is defined as any point or line defined in either the start or end image. This will display the currently selected object, and any associated transparency or velocity curves. These curves are numbered based on how they appear in the curve list.

## At/Position

The At area displays the current pixel position in the image for points and lines. The image coordinates will only be displayed if an image has been loaded into the start or end frames. This coordinate system can be useful for exact specification of points and lines for a morphing sequence. The coordinates are displayed in an X and Y format with X=0, Y=0 being the top left corner of the image.

This area is also used to display the name of the object that the cursor is currently over. The example above shows the Oval drawing tool to be the current position of the cursor. Once you are over an object, you can press the F1 key to access the documentation for that object. This is true for all objects that are defined by the At: display.

## Progress

This area will display the current progress percentage for each operation in the program. The progress bar will be used for loading, saving, rendering, and all other operations. This area will display the progress for each portion of a morph as it is executed.

## Sequence Progress

The Sequence Progress Bar displays the current progress percentage for an entire morphing sequence. This progress bar is also used for progress of FLI/FLC saves and multiple image file loads.

## Pause

This control will pause the generation of the morph when it becomes possible. You can not pause the loading or saving of image files. Once the pause button has been pushed, the sequence can be restarted by pressing this button again.

## Stop

Using this button will stop and cancel the current operation sequence.

**oskin**

## Show Through

The Show Through control allows you to adjust the level of transparency between the start and end image views in the onion skin window. The default setting (50) will result in the onion skin view containing 50% of the color information from the start and end image. Adjusting the slider to the left will give you more color information from the start image (make it more opaque), and adjustments to the right of 50 will result in more of the end image showing through. This means that you can have any amount of either image showing in the onion skin view. Editing and creating control objects is handled exactly the same regardless of this setting.

## S/E

The S and E (start and end) radio buttons allow you to switch the layering of the onion skin from start image objects on top to end image objects on top, and vice versa. This will also change which image is currently active for receiving input from the mouse. Clicking in the onion skin window with an object creation tool selected will result in a new object being specified in the currently active image (start or end). After you have completed the object creation for the start image (right mouse will stop the object specification for all object tools), alter the S/E button to the other image view and specify the corresponding object. You will see lines of correspondence between the two objects after you have completed the second object.

## S/E Contrast

The Start and End image Contrast controls allow you to alter the onion skin image's contrast for the start and end image views. This is particularly useful when the start and end images are very similar in color, and you would like to make one image more distinct than the other. Each control alters only the contrast of the start or end image (dependent on the slider that you are using). The contrast does not alter the actual images, only how they are displayed in the onion skin window. The actual images are never altered by the contrast adjustments. You should notice that after the contrast slider has been moved, the onion skin window is refreshed with the new image contrast information. Returning the contrast sliders to 0 will result in both images appearing un-contrasted in the onion skin window.

## S/E Brightness

The Start and End image Brightness controls allow you to alter the onion skin image's brightness for the start and end image views. This is particularly useful when the start and end images are very similar in color, and you would like to make one image more distinct than the other. Each control alters only the brightness of the start or end image (dependent on the slider that you are using). The brightness does not alter the actual images, only how they are displayed in the onion skin window. The actual images are never altered by the brightness adjustments. You should notice that after the brightness slider has been moved, the onion skin window is refreshed with the new image brightness information. Returning the brightness sliders to 0 will result in both images appearing un-brightened in the onion skin window.

## Selected/All/Off

These controls allow you to specify which control objects will display their lines of correspondence. The first option is to show the currently selected object's correspondence lines. This will change as the current object is changed. The next option is to display all of the correspondence lines for all of the objects in the morph. It is important to remember that with a large number of objects, this selection can become confusing. The Off selection will display no correspondence lines, only the control objects themselves.

## Frame

The Frame control allows you to show the progression of an object for a particular frame. The control ranges from 1 to the total number of frames specified in the Sequence Controls dialog. If the Frame control is set to 1, then the current object's points will appear on the start image object. As the frame value is increased, the points will move along the line of correspondence until they reach the final frame in the sequence. At that point, all of the points will appear on the end image's control object. You can select to generate any of the frames in a sequence by setting the frame value with this control, and then pressing the generate button on this dialog. This will generate the specified frame at that time. If you would like to generate a sequence of frames, select the Sequence Generate option from the Generate menu.

## Point Density

The Point Density control allows you to specify the total number of points in a line or curve. The default setting is 20 points for an object. This means that there are twenty distinct correspondence points along the line or curve. The number of points in a line or curve can be increased or decreased through this control. Increasing the number of points in a line or curve will give that particular object more priority than a line or curve with a lower density setting. For example, a line with a point density of 100 has a higher priority than a line with a density of 20. The number of points in a line will only effect the amount of time needed to setup the morph (this is the first step). It will not effect the amount of time to generate a frame. **Note:** It is important to remember that lower point densities can lead to poorer output quality morph sequences.

## Generate

This option will generate the current frame as set by the onion skin Frame control. This generation process will create only a single frame, and should be used primarily as a preview tool. If you would like to generate an entire sequence of frames, please use the Sequence Generate option from the Generate menu.

**Layer**

## Layers

This portion of the dialog contains a list of all of the layers, and how many objects are in that layer. The example layers dialog contains three layers (Base, Mouth, and eye) each with a number of objects in the layer. You should notice that the "eye" layer is selected, and at the bottom of the dialog it states **Area NOT closed**. This morph sequence would be unable to generate because the layer is not closed. Layers are formed of boundary objects (must be closed) and objects inside the boundary object (do not have to be closed).

## Add New Layer

This option will place a new layer in the list of possible layers for the morph. Once created, the new layer can be named and have control objects placed into it. It is very important to remember that new layers must have an area boundary, and this boundary must be closed. If these conditions are not met, the morph will not generate properly.

## **Remove Layer (Keep Objects)**

This option will delete the currently selected layer (and all related information), but it will leave the objects in the view windows. This allows you to eliminate layer associations without eliminating specified objects.

## **Delete Layer (Delete Objects)**

This option will delete the currently selected layer, and all of the objects within that layer. Once this button has been pressed, all of the objects in that layer will be deleted from the image views.

## Reorder ^

This will move the currently selected layer up one position. It will move the layer that is above it into its initial position. This is true for all layers except the Base layer which can not be moved.

## Reorder v

This will move the currently selected layer down one position. It will move the layer that was below it into its initial position. This is true for all layers except the Base layer which can not be moved.

## **Make area boundary**

This option, when selected, will make the currently selected object into an area boundary for a layer. This means that this object must be closed, and all other objects in the layer must be found within its boundaries. If this is not the case, the morph will not generate properly. If this option is not selected, then the object will be treated like any other object in a layer.

## Rename

This option allows you to alter the name of the currently selected layer. This can be useful for defining particular regions in an image all within the same layer heading. You may alter the name of every layer except the Base layer.

## Area Status

This status line tells you whether the currently selected layer is closed or not. Remember, layers that are not closed will cause the program to halt creation of a single image or sequence. Layers (or layer boundaries) can be closed with a link.

# Glossary of Terms

\Watermark ,x\_ 24 bit  
\Watermark ,x\_ Alpha Channel  
\Watermark ,x\_ Aspect Ratio  
\Watermark ,x\_ Quantization Color  
\Watermark ,x\_ Color Reduction  
\Watermark ,x\_ Color Space  
\Watermark ,x\_ Continuous Tone  
\Watermark ,x\_ Distortion Morph (or Warp Morph)  
\Watermark ,x\_ Dither  
\Watermark ,x\_ Drag and Drop  
\Watermark ,x\_ End Frame (or End Image)  
\Watermark ,x\_ Error Diffusion Dither  
\Watermark ,x\_ Gamut  
\Watermark ,x\_ High Compression  
\Watermark ,x\_ Interframe Compression  
\Watermark ,x\_ Intraframe Compression  
\Watermark ,x\_ Lossless  
\Watermark ,x\_ Motion Morph  
\Watermark ,x\_ NTSC  
\Watermark ,x\_ Ordered Dither  
\Watermark ,x\_ Pal  
\Watermark ,x\_ Palette  
\Watermark ,x\_ Pixel  
\Watermark ,x\_ Real Memory and Virtual Memory  
\Watermark ,x\_ Render  
\Watermark ,x\_ Resolution  
\Watermark ,x\_ Start Frame (or Start Image)  
\Watermark ,x\_ Text Editor  
\Watermark ,x\_ Transition Morph

## **\_\\Watermark ,x\_24 bit**

A 24 bit image uses 24 bits (or three bytes) of information for each pixel in the image. The number of bits per pixel is referred to as the image depth. A greater image depth allows greater color accuracy. For example, images that use 1 bit per pixel have two possible colors; 8 bits can handle 256 colors; and 24 bit images can represent 16.8 million different colors.

## **\_\Watermark ,x\_Alpha Channel**

In addition the color information (**Red,Green,Blue**) that is held for each pixel of an image, there can also be transparency information (Alpha). This transparency data is used when re-combining the subject of an image with its surroundings. So, it effectively depicts the subject's outline.

Just as color information is stored in a range from 0 = black to 255 = full, alpha transparency ranges from 0 = transparent to 255 = opaque. With this range of transparency, soft links and even fading areas can be depicted.

## **\_\Watermark ,x\_Aspect Ratio**

Aspect ratio describes the relative dimensions of an image: width compared to height.

## **\_\\Watermark ,x\_Quantization Color**

Color Quantization refers to the way colors are selected and defined by the program. Morph uses a special process called **Spectral Color Selection** to quantize the colors in an image. This process will look at all of the colors in the image, and then based on the display, select the best colors for image display. These original image colors are quantized into a specific number of colors (256 for a 256 color display, 16 colors for a 16 color display, and so on). This applies for all areas of the program where a large number of colors are forced to a lesser number of colors through some selection process (rendering, display, and palette operations). Color Quantization is directly related to Color Reduction.

## **\_\\Watermark ,x\_Color Reduction**

Color Reduction is the process of selecting a group of colors based on all of the colors in the image.

This includes the palette and dither methods that are to be used. For example, if you were to render a 24 bit image as a 16 color image a color reduction, or color quantization, would occur to select the colors for the 16 color render. Morph uses a special process called **Spectral Color Selection** to quantize the colors in an image. This process will look at all of the colors in the image, and then based on the display or render method selected, Morph will select the best colors for rendering the image.

## **\_\Watermark ,x\_Color Space**

The Color Space refers to a 3D color model that contains a subset of colors in which all colors of a particular gamut are visible. A color space is also known as a color model. The purpose of the color space is to allow the specification of certain colors within a particular gamut of color. There are a number of color spaces used in a wide array of applications including graphics, desktop publishing, desktop video, and NTSC video. Morph uses the following color spaces: **RGB** (red, green, blue), **CMY** (cyan, magenta, yellow), **CMYK** (cyan, magenta, yellow, black), **HSL** (hue, saturation, and luma), **HSV** (hue, saturation, value), and **YIQ** (luminance, chrominance). Each of these color spaces have a physical 3D model which describes their color gamut. It is important to remember that Morph uses "pure colors" instead of actual colors. This is due to the fact that some colors do not exist in some of the other color spaces. For example, the RGB color space contains colors which can not be represented by the YIQ color space model. If you are converting from color space to color space, F/x will automatically select the color which is closest to the original color value.

## **\_\\Watermark ,x\_Continuous Tone**

A continuous tone image has a smooth transition of color and brightness between pixels. For example, a photograph that was scanned would produce a continuous tone image, but a rendered 256 color BMP would not be.

## **\_\Watermark ,x\_Distortion Morph (or Warp Morph)**

An original image which is shape changed without any fading to a second image.

## **\_\\Watermark ,x\_Dither**


Dither uses a limited number of colors arranged spacially to represent an actual continuous tone image. It is also called digital halftoning. In a way, dithering compromises spacial accuracy for color accuracy. Human perception is able to 'reconstruct' the color that was originally intended over an area. A dithered image is no longer continuous tone.

## **\_\Watermark ,x\_Drag and Drop**

Drag and Drop is a means of loading files into a program directly from the File Manager. In WinImages: morph image files can be dragged into the Start and End windows.

- (1) With the WinImages: morph program opened, open the file manager
- (2) Make sure that both the File Manager and Start Frame windows are visible
- (3) Click down on the image file you want loaded
- (4) With the mouse button still down move the pointer to the window in Morph
- (5) Release the mouse button over the window



When dragging files, the pointer will look like  if the file can be dropped into the underlying window, and



if it cannot be dropped there.

## **\_\Watermark ,x\_End Frame (or End Image)**

The source image in a morph that depicts the final position and possibly the final color of a morph.

## **\_\\Watermark ,x\_Error Diffusion Dither**

Error Diffusion Dither (or EDD) will dither the image based on the specific pixel colors, and the colors of neighboring pixels. This will generally produce the highest quality dithering in the image, with the best possible colors being represented by the dither. This is done at the expense of adding more "noise" to the image. This means that in some cases the dither is easier to perceive. This type of situation can be remedied by decreasing the dither amount, or by always working with 24bit files and output images. Remember, the quality of the final result is directly related to the initial image quality.

## **\_\\Watermark ,x\_Gamut**

The Gamut of a display or color space refers to the actual color range that can be represented by the display device or color space model. Most color spaces lie within the visible spectrum of colors. A gamut lies within that visible spectrum defining a range of colors for a particular color space. These gamuts do not necessarily display the same range of colors. For example, the RGB gamut can display colors that the CMYK (printed material) or YIQ (NTSC video) gamuts can not.

## **\_Watermark ,x\_High Compression**

Most image file formats compress the image during the saving process. Therefore, a 1 Mb image in memory may only require 0.6 Mb to save to disk. There are many different methods of compression in use. They vary in speed and in their ability to reduce the file size.

The amount of space saved by the compression is usually expressed as a percentage of the original size. Typically, lossless image formats can save about 30 to 40 %. A high compression format does better than this. How much better depends on the nature of the image, but a colorful scanned photograph can typically be compressed (losslessly) by 50 to 60% and ray traced images by 60 to 80%.

Image file formats that are not lossless, can achieve very high compression values typically about 95 to 98 %.

## **\_\\Watermark ,x\_Interframe Compression**

Interframe compression is the amount of compression between individual animation frames. This type of compression can be augmented through the use of an Ordered Dither. Ordered dither will increase the amount of possible interframe compression, while decreasing the overall size of the animation file. You can set the compression level using tools like Microsoft Video for Windows' **VidEdit**. VidEdit allows you to adjust the quantity and quality of the interframe compression used.

## **\_\Watermark ,x\_Intraframe Compression**

Intraframe compression is the amount of compression in an individual animation frame. This type of compression can be increased through the use of the Dither Amount control in the **Output Color Reduction** dialog. Decreasing the dither amount will also decrease the actual animation frame's size.

## **\_\\Watermark ,x\_Lossless**

The ability to save an image and load it again exactly as it was, is called 'lossless'. Only 24-bit full color image formats can be lossless when saving full color images.

Image formats which render to fewer colors are lossy and therefore compromise image quality. And, some full color image formats such as JFIF/JPEG are also lossy. They are able to achieve very high compression by compromising some image quality.

## **\_\\Watermark ,x\_Motion Morph**

A Motion Morph applies a shape change to a sequence of original images which each show change or motion. The Start and End frames are then, not just still images, but motion video.

Motion Morphs are also called animation morphs (although an animation can be created from still originals) and this use of motion video is sometimes referred to as rotoscope sequencing.

## **\_\\Watermark ,x\_NTSC**

NTSC (or National Television System Committee) video is the standard signal format used in North American television broadcasts. This format combines the color, intensity, and synchronization information into a bandwidth of about 5MHz. Due to the bandwidth limit, the picture quality is limited to a resolution of about 350 by 350, or about 640 by 400 pixels (no overscan). This standard, despite its low resolution nature, is the standard for all videotape recording equipment, and video play back devices. This standard may change in the future with the introduction of HDTV (High Definition Television), which has an effective resolution of 1000 by 1000. NTSC uses the YIQ color space for color definition and display.

## **\_\\Watermark ,x\_Ordered Dither**

Ordered Dither will dither the image based on the current pixel, and that pixels location in the actual image. This type of dithering will generally produce a lower quality image, but is necessary for animation that will be using any type of compression. The ordered dither allows for a great deal of interframe compression, which is needed to compress animation files. This type of dithering should only be used for the output of animation files. If you want to produce higher quality output images (not animations), you should use the EDD dither method. If you want to produce even higher quality render, you should use 24bit file or animation formats. Remember, the quality of the final result is directly related to the quality of the initial image.

## **\_\Watermark ,x\_Pal**

PAL (or Phase Alternate Line) is the video and television standard used throughout Europe and most of the world (North America uses NTSC). The PAL format uses 625 scan lines at 50 Hz. The effective pixel resolution of a PAL display is 640 by 512 pixels (no overscan).

## **\_\Watermark ,x\_Palette**

A palette on the computer is a table of colors. WinImages:morph sets a display palette on computers with displays having 256 or less colors. Some image formats that are NOT full color, use a color palette (8 Bit BMPs for example). When an image is displayed or saved using a palette, the image itself is changed to an array of numbers which index (or refer to) the color palette.

## **\_\Watermark ,x\_Pixel**

An image pixel is one of the dots that it is composed of. Similarly, a display screen shows an array of pixels that make up the image you see. In WinImages: morph each pixel is held in memory as three values:

**red**

**green**

**blue**

Each having 256 possible levels. Combinations of these three values can represent any given color or brightness.

## **\_\\Watermark ,x\_Real Memory and Virtual Memory**

Even though the amount of memory your computer has is limited, morph is able to load images that exceed that amount by allowing Windows to move some of its memory to disk.

For some operations though, the data used to describe an image must be reloaded from disk back into the memory chips of your computer. When the memory is actually in the memory chips it is called real memory. The total amount of memory in the memory chips and swapped out to the disk is called virtual memory.

## **\_\\Watermark ,x\_Render**

To render generally means to create an image from some set of information. In WinImages: morph images that are displayable on your computer are rendered from the full color image in memory.

If your display can show 256 simultaneous colors, morph will render down from the full color (16.8 million color) image to 256 colors for display. Also, when saving low color images such as 8 Bit BMPs, morph will render to the low color format.

## **\_\Watermark ,x\_Resolution**

Resolution refers to the size of an image in pixels. The standard VGA display has a resolution of 640 (width) by 480 (height) pixels. WinImages: morph does not restrict image size, however larger image sizes will require more memory.

## **\_ \Watermark ,x\_Start Frame (or Start Image)**

The source image which shows the position and color at the start of a morph. Note, that with the use of non-standard transparency and velocity curves, the beginning result frame of a morph may not be the same as the start frame.

## **\_\\Watermark ,x\_Text Editor**

A text editor is a program that can change a text file simply and directly. Some system files such as AUTOEXEC.BAT (under the DOS operating system) can be changed with a text editor.

WinImages:morph also saves project and some other files as text. They can be changed with a text editor. Word processors or desk top publishing packages, on the other hand, put special codes into their files; so, they could not be used to alter system files or morph project files.

## **\_\Watermark ,x\_Transition Morph**

The changing of an original image into the shape of another. When the color information of the final image is also faded in, there is a complete transition from one image to another. The intermediate steps are called morph frames.

