Appendix II - Drawing Mode Reference

Introduction

Drawing modes are used in all visual objects within LiveStage Professional. A drawing mode tells QuickTime how the particular visual object is to be drawn in the movie. To see an example of the different drawing modes you should run the “Graphics Modes” demo movie included in the “Featured Demos” in the samples folder on the CD. This movie allows you to view the various drawing modes and how they work with multiple graphics.

Some drawing modes are designed to perform a basic operation that will always operate the same way, others take an OpColor. An OpColor is an RGB value which acts as a modifier for the drawing mode. The blend operation is a good example of this. It uses the OpColor to specify how much of a blend will occur between the source image and the destination.

Drawing Mode Descriptions

The drawing modes included in LiveStage Professional are described below, however you may wish to try out the Graphics Modes sample movie included. Playing with this sample movie will provide you with a better understanding of how each of the drawing modes operate.

Copy | SrcCopy	Performs a straight copy of the source onto the destination.
Inverse Copy | notSrcCopy	This operates the same as the Copy mode except that color information from the source is inverted. This means that black becomes white and white becomes black.

Or | SrcOr	Operates similar to a copy except any image information set in either the source or destination images is kept. For example, if you have two images, one is an A in black and the other is a B in black. When they overlap using Or both will show.
Inverse Or | notSrcOr	Inverse Or inverts the source and then performs a standard Or operation on the source and destination.
Exclusive Or | SrcXor	An Exclusive Or drawing mode works like the Or drawing mode except where pixels set in the source and destination images occupy the same location. In this case the pixels are turned off. Referring to the example in the Or drawing mode, where ever A and B overlap each other the result would be white pixels.
Inverse Exclusive Or | notSrcXor	This drawing mode inverts the source and then performs the Exclusive Or drawing mode. This results in areas in the source and destination that are black will become white. Areas where the source is black and the destination is white will be drawn in black. If the source is white and the destination is white the resulting pixels will be white. If the source is white and the destination is black the result will be black.
Bit Clear | SrcBic	This mode takes any pixels that are black in the source and where these overlap black pixels in the destination the pixels are set to white.
Inverse Bit Clear | notSrcBic	Inverse Bit Clear will clear all pixels that are black in destination when a white pixel in the source overlaps it. Any black pixels in the source will allow black pixels in the destination to show through.
Blend | blend	The Blend graphics mode will produce a weighted average of the source and destination pixels. This graphics mode uses the OpColor to indicate the weighting applied to the blending. If the OpColor is white the source image data is copied over the destination. Using an OpColor of 50% gray will take half of the source color and half of the destination color to produce the result. Finally, an OpColor of black will use only the destination pixels, no source pixels will be shown.

Transparent | transparent	The color you specify in the OpColor will be rendered transparently in the source image. Note that only the Animation Codec supports this mode properly. Using other Codecs with this mode will produce undesirable results.
Add Max | addMax	Color values set in the source image data will add to the colors in the destination. Any white pixels in the source image will force white in the destination, black pixels add no color information to the destination thus letting the source pixels to show through.
Add Min | addMin	This mode operates opposite to the Add Max graphics mode. With this mode any white pixels do not affect the destination pixels thus letting the destination pixels to show through. Any black pixels in the source image will force black on the destination.
Add Over | addOver	This mode takes the sum of the source and destination image data to produce its result. If the value exceeds the maximum color value the new value will be the sum minus the maximum color value. The maximum color value is 65535.
Add Pin | addPin	This mode assigns to the destination pixel the color closest to the sum of the destination pixel values. This value is constrained to a maximum value indicated by the OpColor setting.
Sub Over | subOver	The result of this graphics mode is the color closest to the difference of the source and destination pixels. If the result of this operation is less than zero the result wraps around to the maximum color value (65535) minus the result.
Sub Pin | subPin	The result of this graphics mode is the color closest to the difference of the sum of the source and difference pixel values. The maximum value of the result is limited by the value of the OpColor.
Dither | ditherCopy	Same as the Copy drawing mode except that dithering is performed if the destination bit depth is less than that of the source.
Grayish Text Or | grayedTextOr	Similar to Or, but makes use of the gray text color to draw text that appears dim.
Hilite | hilite	Replaces areas of the image with the hilight color defined by the user.

Alpha Channel | graphicsModeStraightAlpha	Straight alpha combines the source pixel value with the background pixel based on the value contained in the alpha channel. For example, if the alpha value is 0, only the background pixel will appear. If the alpha value is 255, only the foreground pixel will appear. If the alpha value is 127, then (127/255) of the foreground pixel will be blended with (128/255) of the background pixel to create the resulting pixel, and so on.
Pre-White Alpha | graphicsModePreWhiteAlpha	Pre-multiplied with white means that the color components of each pixel have already been blended with white, based on their alpha channel value. Effectively, this means that the image has already been combined with a white background. To combine the image with a different background color, QuickTime must first remove the white from each pixel and then blend the image with the actual background pixels. Images are often pre-multipled with white as this reduces the appearance of jagged edges around objects.
Pre-Black Alpha | graphicsModePreBlackAlpha	Pre-multipled with black is the same as pre-multipled with white, except the background color that the image has been blended with is black instead of white.
Composition | graphicsModeComposition	Supports rendering of image data like that of animated GIFs where differencing can occur between frames, or special rendering operations are performed.
Alpha Blend | graphicsModeStraightAlphaBlend	This graphics mode causes QuickTime to interpret the alpha channel as a straight alpha channel, but when it draws it combines the pixels together and applies the color specified in the OpColor to the alpha channel.
Pre-Multiply Alpha | graphicsModePreMulColorAlpha	Pre-Multiply Alpha is the same as pre-multipled with white, except the background color that the image has been blended with is the OpColor instead of white.